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Poison Gas Proliferation: Paradox, Politics, and Law

JOHN PAUL JONES* and EILEEN N. WAGNER**

I. INTRODUCTION

"If I am remembered for anything," declared then candidate George Bush in a 1988 campaign speech, "it would be this, a complete and total ban on chemical weapons."¹ One year later, on the eve of a war in which Iraq was expected to use chemical weapons against United States troops, President Bush vetoed a bill giving him the sanctioning power to stem the global proliferation of chemical weapons.²

After the war's outbreak, Israeli civilians within the range of Iraqi SCUD missiles and allied troops in Operation Desert Storm braced themselves for a chemical weapons attack. Despite experts' assessments that Iraq possessed enough chemical weapons to mount a devastating attack, and Iraqi leader Saddam Hussein's threats to use those weapons,³ the fighting ended without a chemical attack. President Bush's veto and the Iraqis' restraint represent just two of the many paradoxes surrounding the proliferation of the "poor man's

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1. Richard A. Clark, *Statement for the International Government-Industry Conference Against Chemical Weapons* DEP'T ST. BULL., Nov. 1989, at 45.

2. James Gerstenzang, *Bush Likely to Veto Bill on Gas Biological Arms*, L.A. TIMES, Nov. 16, 1990, at A12.

3. Robert Pear, *Iraq Can Deliver, U.S. Chemical Arms Experts Say*, N.Y. TIMES, Apr. 3, 1990, at A8.

atom-bomb." This Article analyzes a series of paradoxes emanating from President Bush's campaign against chemical weapons.

Part I examines the four levels of proliferation that realistic controls must address. The first level is the ultimate consumer, consisting of those nations that might use such weapons. The second level consists of foreign companies providing technological assistance to such nations. The third level is composed of United States companies supplying raw materials called "precursors." The fourth level consists of independent brokers linking suppliers with users. Powerful market forces create this combination of unlikely suppliers whose own nations have decried the use of chemical weapons.

Part II outlines the tactical and theoretical attractions of chemical agents for the conventional military and terrorist guerrilla arsenal. A discussion of the efficacy of known chemical agents and their manufacture will frame the practical problems inherent in any program to limit proliferation. These technological problems create another paradox for nations wishing to balance the power in their regions.

Part III examines the Export Administration Act.⁴ This legislation authorizes the United States to unilaterally sanction foreign and domestic companies, as well as foreign nations. The tension created by the competing goals of fostering international trade and controlling foreign policy explains the ironic congressional struggle to add chemical warfare sanctions to the Export Administration Act. The evolution of unilateral control of chemical weapons proliferation points to the fundamental deficiencies in United States export policy.

Part IV outlines the international initiative to control chemical weapons through the Geneva Conference on Disarmament. Verification, the critical issue in the multilateral effort to halt proliferation, has created unlikely coalitions within the camps favoring and opposing the multilateral global ban. The Chemical Weapons Convention surmounted many technological impediments to achieve ratification in January, 1993.

Part V suggests both unilateral and multilateral action to resolve the collection of paradoxes which has emerged from the chemical weapons controversy.

After a close call with chemical weapons in the Iraqi desert,⁵ the world powers must face this issue. Whether the Iraqis were restrained

4. 50 U.S.C. app. §§ 2401-24 (1990).

5. It must be noted that some observers doubted the Iraqis' threats to use chemical weapons in battle, stating:

by fear of retaliation or simply frustrated by bad weather, the threat of chemical attack played a significant role in the allied action to liberate Kuwait just as it significantly affected the lives of the citizens of Tel Aviv. As United States Senator Claiborne Pell said in the closing hours of the war, "We should not, however, rely on good fortune to protect us."⁶

I. FOUR CRITICAL SOURCES OF CHEMICAL WEAPONS PROLIFERATION

Third world countries' production of chemical weapons depends on a four stage economic structure. The mainstay of this structure is the user, a customer willing to breach a long global tradition against the use of chemicals. That customer must also possess sufficient cash to garner any technical assistance and supplies more advanced nations may have for the purpose. Given an enthusiastic and well-endowed user, the "invisible hand" of unregulated economics is certain to provide suppliers. Even under close regulation, the greater the demand, the more likely a supplier will risk circumventing regulation. By depending on a specialized class of brokers in the world arms market to bring sources to the user, the chemical industry has circumvented the barriers of anti-proliferation regulations.

A. Users of Chemical Weapons: Libya Stands In for Iraq

Photographs suggested it, and later evidence confirmed it.⁷ Bod-

It is hard to see what advantage Hussein could gain from chemical weapons. With the exception of mustard, his chemical agents would quickly dissipate — largely by evaporation — in the desert heat. Chemical weapons work best against unprepared ground troops. But the United States has taken extensive measures to counter the Iraqi threat. In the event the Iraqis launch a chemical attack against U.S. troops, our forces would simply don their chemical protective gear, pull back to safe ground, and wait for U.S. planes and missiles to pulverize Iraq. The chemical weapons could perhaps strike more effectively against airfields and aircraft used by the United States, contaminating them to put them out of service.

. . . [Chemical weapons] are difficult to employ effectively on the battlefield because of their double-edge nature — they would deny areas as much to Iraq as to the United States. Most certainly they would dramatically escalate the conflict. While Saddam Hussein may be mad, he is not crazy, and certainly understands these consequences.

Neil C. Livingstone & Joseph D. Douglass, *Iraq Won't Try Now to Use Its Poison Gas*, *NEWS-DAY*, Aug. 21, 1990, at 57.

6. 137 CONG. REC. S1890 (1991).

7. For a discussion of this evidence, see *Global Spread of Chemical and Biological Weapons: Assessing Challenges and Responses: Hearings of the Senate Comm. on Government Affairs, and its Permanent Subcomm. on Investigations*, 101st Cong., 1st Sess. 42-45, 204 (1989) [hereinafter *Governmental Affairs Hearings*] (testimony of Drs. Robert Mullen Cook-Deegan

ies of men, women, and children scattered about the landscape convinced United Nations investigators in March 1988, that the Iraqi military had used poison gas in Kurdistan.⁸ The devastating potential of chemical weapons horrified the world during World War I, and propelled nations to ban their use in the Geneva Protocol of 1925.⁹ Iraq signed that agreement in 1931. The 1988 death toll in Halabja, calculated to be between 3500¹⁰ and 5500,¹¹ prompted the sixth complaint in eight years to the United Nations about Iraqi use of poison

and Matthew S. Meselson, respectively). Professor A. Heyndricks, Chief of the Department of Toxicology in the State University of Ghent, Belgium, and Project Director of the United Nations International Development Organization, identified through toxicological tests of the Kurdish victims that three agents had been used against them: mustard gas, an organic phosphate nerve gas, and cyanide derivations. *Id.* at 47 (testimony of Dr. Deborah Lief-Dienstag).

8. Isabel O'Keeffe, *Flanders Fields Revisited*, NEW STATESMAN & SOC., reprinted in WORLD PRESS REV., Mar. 1989, at 12.

9. The text of the Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare, June 17, 1925, 26 U.S.T. 571, 94 L.N.T.S. 65, provides as follows:

Whereas the use in war of asphyxiating, poisonous or other gases, and of all analogous liquids, materials or devices, has been justly condemned by the general opinion of the civilized world, and

Whereas the prohibition of such use has been declared in Treaties to which the majority of Powers of the World are Parties, and

To the end that this prohibition shall be universally accepted as part of International Law, binding alike the conscience and the practice of nations,

Declare:

That the High Contracting Parties, so far as they are not already Parties to Treaties prohibiting such use, accept this prohibition, agree to extend this prohibition to the use of bacteriological methods of warfare and agree to be bound as between themselves according to the terms of this declaration.

The High Contracting Parties will exert every effort to induce other States to accede to the present Protocol. Such accession will be notified to the Government of the French Republic, and by the latter to all signatory and acceding Powers, and will take effect on the date of the notification by the Government of the French Republic.

The ratification of the present Protocol shall be addressed to the Government of the French Republic, which will at once notify the deposit of such ratification to each of the signatory and acceding Powers.

The instruments of ratification and accession to the present Protocol will remain deposited in the archives of the Government of the French Republic.

The present Protocol will come into force for each signatory Power as from the date of deposit of its ratification, and, from that moment, each Power will be bound as regards other powers which have already deposited their ratification.

In Witness Whereof the Plenipotentiaries have signed the present Protocol.

Done at Geneva in a single copy, this seventeenth day of June, One Thousand Nine Hundred and Twenty-five.

The Protocol entered into force on February 8, 1928. The United States Senate advised ratification on December 16, 1974, and the President did so on January 22, 1975, almost fifty years after the Protocol's creation. See *Governmental Affairs Hearings*, *supra* note 7, at 234.

10. *Id.* at 48-55.

11. The Iranian estimate was higher. O'Keeffe, *supra* note 8, at 12.

gas.¹² Though more than 200 wars had been fought since the signing of the Geneva Protocol, only five violations of its tenets previously had been confirmed.¹³ Clearly, the Iraqis possessed a chemical arsenal of some sophistication,¹⁴ and they intended to use it.¹⁵

The world opinion turned a disinterested ear to reports of chemical weapons use during the eight year Iran-Iraq war which began in 1980.¹⁶ Likewise, reports that Libya used chemical agents in its war with Chad stimulated little interest. During the period prior to the United Nations' Kurdistan investigation, the spotlight of controversy turned on the Soviet Union concerning possible violations of the Geneva Protocol of 1925. The United States insisted that evidence supported the allegation that the Soviet Union was using "yellow rain" biological agents against the Hmong tribes in Southeast Asia.¹⁷ United States experts argued over whether microtoxins or bee feces were the source of the phenomenon, and whether the Soviet's apparent superiority in both biological and chemical warfare agents justified renewal of the United States development program.¹⁸ Meanwhile, little attention was paid to the activities of the two Arab nations.

Ironically, the Libyans¹⁹ would take the brunt of world oppro-

12. The United States Army War College Strategic Studies Institute concluded the gas which killed civilians at Halabja was a "blood agent" that the Institute has reason to believe was employed by *Iran*, not Iraq. 11 CHEMICAL WEAPONS CONVENTION BULL., Mar. 1991, at 5.

13. *Id.*

14. For example, in 1967:

Saddam Hussein toured U.S. chemical weapons facilities with a dozen young Iraqi officers. At Edgewood Arsenal and Aberdeen Proving Grounds . . . they were briefed on the design of chemical weapons. They visited the Army chemical school at Ft. McClellan in Alabama and ended their trip at Dugway, Utah, where they watched the firing of live nerve agent artillery shells . . . He had previously visited the massive Soviet Shikhany chemical warfare facility.

Livingstone & Douglass, *supra* note 5, at 57.

15. See generally Nina Bernstein, *The War in the Gulf Training Ground for Terror. Now Closed, Stasi Camp Another Link in German-Iraqi Connection*, NEWSDAY, Feb. 11, 1991, at 4. East Germany trained Iraqi terrorists in the use of nerve gas at a training center near Massow, south of Berlin. According to former East German General Karl-Heinz Nagler, who commanded the project from 1975 to 1986, the East German army simultaneously set up a "defensive" chemical weapons training installation near Baghdad. "The Iraqi soldiers should not be underestimated . . . They're trained, they're armed, they understand these weapons, and they're ready to use them." *Id.*

16. Thomas Whiteside, *Annals of the Cold War: The Yellow-Rain Complex-1*, NEW YORKER, Feb. 11, 1991, at 38.

17. *Id.* at 50.

18. The program was curtailed in 1971. Livingstone & Douglass, *supra* note 5, at 58.

19. The Executive Director of the American-Israeli Public Affairs Committee told the United States Senate:

brium once the industrial nations realized that a significant military power had dishonored the Geneva Protocol of 1925. Weak attempts to curb the export of raw materials to Iraq represented the extent of world disapproval for the deaths of Kurdish civilians. Such flimsy attempts to sanction Iraq were drowned in angry rhetoric prefacing the Paris Conference on Chemical and Biological Weapons ("Paris Conference").²⁰

Instead, irate accusations were directed at Libya, which was building what the United States claimed to be a sophisticated industrial complex at Rabta to produce large quantities of mustard gas.²¹ Throughout the Paris Conference, and in the months following, the Bush Administration kept the spotlight of world opinion glued to the plant located forty miles outside Tripoli. During that time, President Bush insisted that the nations of the world cut off supplies of the raw materials necessary to produce mustard gas and the more deadly nerve gases.

B. Technology Suppliers: Imhausen-Chemie Takes the Rap

By eavesdropping on a frantic series of telephone calls from the Libyans seeking West Germany's advice on how to handle an accidental spill, the United States Central Intelligence Agency ("CIA") confirmed its suspicions that a West German company, Imhausen-Chemie of Lahr, provided significant technological assistance to the Libyan construction project in Rabta. The sequence of events linking Imhausen-Chemie to the Rabta facility would emerge in an unprecedented report to the West German Parliament, supported by specially declassified documents.²² By the time the report was released, however, the press had unearthed most of the details. Although the two versions did not contradict each other, discrepancies regarding timing

Iraq, for example, is thought to be operating five chemical complexes that are capable of producing 50 tons of Tabun and Sarin nerve gas and 720 tons of mustard gas per year, while Libya is putting the finishing touches on a chemical weapons facility that will be capable of producing five tons of mustard gas daily.

Chemical and Biological Weapons Threat: The Urgent Need for Remedies: Hearings of the Senate Comm. on Foreign Relations, 101st Cong., 1st Sess. 230 (1989) (statement of Thomas S. Dine) [hereinafter Foreign Relations Hearings].

20. This conference was called at the request of the Bush Administration in January 1989. See *Foreign Relations Hearings, supra* note 19, at 47.

21. See *The True German Export Control Policy: Profiteering at the Expense of Western Security?*, CENTER FOR SECURITY POL'Y PUB. 90-P85 (Sept. 1990) (press release).

22. See generally *Report Submitted by the Government of the Federal Republic of Germany to the German Bundestag on February 15, 1989: Hearings of the Senate Comm. on Foreign Relations, 101st Cong., 1st Sess. 46-108 (1989) [hereinafter Report to the Bundestag].*

and motive left most analysts perplexed by the revelations.²³ Specifically, they questioned why the West German government did nothing once learning of Imhausen-Chemie's illegal activities in 1985. Furthermore, they wondered why the West German government suddenly prosecuted the miscreant in 1988, while completely revamping the West German export law with a legislative enthusiasm that its primary critic, the United States, has so far been unable to muster.

1. Logistics of Chemical Weapons Technology Transfer

Even without the political puzzler of the West German government's sudden change of policy, the Imhausen-Chemie affair resembles a cold war spy novel. Dr. Jurgen Hippenstiel-Imhausen, the company's president,²⁴ insisted that:

The company had absolutely nothing to do with the allegations We don't even have the know-how in this area. We have no employees there [Rabta] Libyans don't have money to pay for things like that. We totally deny any involvement in this.

The Libyans are much too stupid to run a plant like this. All the Arabs are lazy and they call in foreign slaves to do the work.²⁵

Imhausen-Chemie clearly possessed the know-how. In 1985, the company entered a dispute with the West German chemical regulatory agency about the production of pinacolyl alcohol, a chemical required for making the deadly nerve gas, Soman.²⁶ The report to the Bundestag revealed that the West German Federal Intelligence Service ("BND") had information as early as April 1980, that West German firms were helping Libya develop a suspicious chemical plant.²⁷ Imhausen-Chemie was identified by name in West German intelligence reports in July 1985.²⁸ Prior to that identification, West Ger-

23. See Rabtagate: The Inside Story of German Collusion in the Libyan Chemical Warfare Program, CENTER FOR SECURITY POL'Y PUB., No. 90-P85 (Sept. 1990) (press release) [hereinafter Rabtagate].

24. Dr. Hippenstiel was convicted of illegally exporting chemical weapons and jailed for five years in July 1990. Debbie Jackson, *Chemical Weapons: Germans Come Under Fire*, CHEMICAL WK., Sept. 12, 1990, at 16.

25. See Michael Ledeen, *The Curious Case of Chemical Warfare*, 88 COMMENTARY 37, 38 (1989).

26. *The New Merchants of Death*, DER SPIEGEL, reprinted in WORLD PRESS REV., Mar. 1989, at 13.

27. *Report to the Bundestag*, supra note 22, at 52.

28. *Id.* at 54. Even more surprising, the Federal Office of Economics and the Federal Ministry of Economics had conducted an investigation of Imhausen-Chemie which concluded in July, 1985. The investigation was initiated because the company had never applied for any export licenses, even for shipments to its subsidiary in Hong Kong. *Id.*

man intelligence had developed a comprehensive profile of the Rabta facility's activities, confirming mustard gas as its product.²⁹ Imhausen-Chemie avoided direct involvement by setting up a dummy company in Hong Kong, called Pen-Tsao-Materia-Medica-Center Limited ("Pen-Tsao").³⁰ Though Dr. Hippenstiel organized Pen-Tsao and a collection of other companies in Hong Kong, he transferred control to B&M Secretaries, under the direction of Daniel P. S. Cheng, director of a jewelry and cotton cloth exporting company, Dee Trading. Dee Trading held twenty-three percent of the stock of Imhausen-Chemie, a multimillion dollar corporation.³¹

Pen-Tsao ordered chemicals and parts for a project called "Pharma 150" from Imhausen-Chemie, shipping them through Antwerp, Belgium.³² In route to Hong Kong, the documents for the shipments were changed, as was their destination.³³ Shipments "from Hong Kong went through Singapore to a fake end-user destination and then [were] diverted to Libya."³⁴ Even more embarrassing to the West German government was the fact that the diverted shipments also contained goods originally ordered from a subsidiary of the state-owned Salzgitter industrial group.³⁵

Imhausen-Chemie employees at the Rabta production center were contracted out to the Pharma 150 project.³⁶ The facility had doors suitable for aircraft, steel floors more than three quarters of an inch thick, glass-lined equipment piping, video surveillance, radar, and anti-aircraft missile emplacements. Libyan leader Muammar Qaddafi insisted that the Rabta plant was intended to manufacture pharmaceuticals,³⁷ even after a mysterious fire supposedly destroyed

29. *Id.* at 53.

30. John Templeman et al., *How Qaddafi Built His Deadly Chemical Plant*, BUS. WK., Jan. 23, 1989, at 50. For a detailed summary of worldwide press coverage about Rabta, see GORDON M. BURCK & CHARLES C. FLOWERREE, *INTERNATIONAL HANDBOOK ON CHEMICAL WEAPONS PROLIFERATION* 277-98 (1991).

31. Templeman et al., *supra* note 30, at 51.

32. Interpol reported to the German Federal Criminal Police on January 18, 1989, that Gedopt of Antwerp, a Belgian haulage contractor, was suspected of falsifying shipping documents regarding chemical supplies. *Report to the Bundestag*, *supra* note 22, at 80.

33. *The New Merchants of Death*, *supra* note 26, at 14.

34. Templeman et al., *supra* note 30, at 51.

35. *That German Innocence*, THE ECONOMIST, Jan. 21, 1989, at 45 [hereinafter *That German Innocence*]. See also *Report to the Bundestag*, *supra* note 22, at 106.

36. See *Report to the Bundestag*, *supra* note 22, at 106.

37. Michael R. Gordon, *U.S. Intelligence Aides Say Libya is Again Making Chemical Arms*, N.Y. TIMES, Mar. 7, 1990, at A4.

the plant.³⁸ As records eventually showed (despite Dr. Hippenstiel's efforts to conceal them in a Zurich subsidiary), Imhausen-Chemie provided everything from computer software to liquid processing and testing equipment³⁹ for the Pharma 150 operation.⁴⁰ Israeli intelligence estimated that the Rabta facility could produce forty-two tons of mustard gas and Sarin per day.⁴¹ A second plant, Pharma 200, was in the development stages even as Dr. Hippenstiel⁴² faced a five-year jail term, having finally confessed to his involvement with the Rabta facility with June 1990.⁴³

Imhausen-Chemie did not work alone at Rabta. Siemens, a major German chemical manufacturer, was also implicated when journalists, on a tour organized by the Libyan government to counter United States accusations about Imhausen-Chemie's output, photographed crates bearing Siemens' logo.⁴⁴ In addition, "Hanover based Preussag . . . [was] suspected by the United States of providing key equipment to Qadafi."⁴⁵ Preussag insisted it was supplying, with West German government approval, a water purification plant three miles away from the Rabta site. Moreover, the company asserted that a Japanese firm, Japan Steel Works Ltd., built a supporting facility for the Rabta complex, claiming they were providing lathes and air guns for an equipment factory to support a desalinization plant.⁴⁶

Rabta was not the only West German foray into Middle East chemical weapons plant construction. Karl Kolb & Co., through its

38. On March 14, 1990, the Libyans reported a serious fire at the Rabta facility involving loss of life and significant destruction. The Libyans blamed Bonn, Tel Aviv, and Washington, in succession. By June, however, United States intelligence sources were convinced that the fire was a hoax, and that hundreds of tires were probably set ablaze so that satellite reconnaissance would register the event. Michael R. Gordon, *U.S. Says Evidence Points to Hoax in Fire at Libyan Chemical Plant*, N.Y. TIMES, June 19, 1990, at A8.

39. Templeman et al., *supra* note 30, at 50.

40. Ledeen, *supra* note 25, at 38.

41. Templeman et al., *supra* note 30, at 51.

42. Dr. Hippenstiel testified that he avoided taxes of about \$9.5 million on the profits from the \$136 million project at Rabta. *W. German Admits Helping Libya Build Chemical Plant*, CHI. TRIB., June 14, 1990, at 21.

43. "Fool Me Twice?" Imhausen Believed Building Second Poison Gas Factory in Libya, Center for Security Pol'y, Pub. 90-P 80, (Aug. 1990) (press release). An unclassified cable from the United States Consul in Stuttgart suggests that Imhausen-Chemie continued activities to build a second plant in the Sebha Oasis south of Tripoli eight weeks after Dr. Hippenstiel was sentenced to five years in prison. Further, the cable intimated that Imhausen-Chemie had defrauded the West German government in order to underwrite the Pharma 200 project. *Id.*

44. Ledeen, *supra* note 25, at 38.

45. Templeman et al., *supra* note 30, at 50.

46. *Id.* at 51.

subsidiary, Pilot Plant, together with Water Engineering Trading of Hamburg, reportedly delivered a "turnkey" chemical weapons plant to the Iraqis at Samarra.⁴⁷ The West German press also implicated Foxboro Deutschland, a subsidiary of Foxboro Company of Foxboro, Massachusetts, as a participant in the Samarra plant.⁴⁸ These companies were following the lead of Swiss based Kregs A.G., which provided technology to construct a plant to manufacture phosphorous trichloride, an essential ingredient for nerve gas, at Abu Zaabal, Egypt after 1985. Operating under the lenient eye of the Swiss government, Kregs also obtained permission to help Iran produce phosphorous pentasulfide, another nerve gas ingredient.⁴⁹

2. Logistics of Moving the West German Government into Action

For eight years, the West German government collected information about the Rabta facility's development and about the West German firm's involvement in the project. Even the most casual reader of the chronology of intelligence reports outlined in the February 1990 Report to the Bundestag may question West Germany's contention that appropriate agencies did not know of the West German firm's involvement.⁵⁰ The West German government insisted that it lacked probable cause until the summer of 1988, and that the series of intelligence reports dating back to 1980 concerning the Rabta facility contained nothing more concrete than "varied trends" and "rumors."⁵¹ Defending the timeliness of the investigation of Imhausen-

47. Jackson, *supra* note 24, at 16. The plant was dedicated to producing two nerve gases. The Samarra complex was destroyed "in the early stages of the multinational offensive against Iraq." John Eisenhammer, *Crisis in the Gulf: The Merchants of Death 'Will Be Brought to Book,'* THE INDEPENDENT, Jan. 31, 1991, at 6.

48. Jackson, *supra* note 24, at 16.

49. Michael R. Gordon & Stephen Engelberg, *Egypt Accused of Big Advance on Poison Gas*, N.Y. TIMES, Mar. 10, 1989, at A1.

50. Note the following statement of May 1988:

The BND reports that it is highly likely that a plant for the manufacture of nerve gas is being or has been built in connection with an almost completed industrial plant near Rabta. Companies from the Federal Republic have not so far made an appearance in the business, it is said.

Report to the Bundestag, supra note 22, at 59.

Compare the following, made in February 1988: "The supply of equipment has mainly been organized via Switzerland, with German intermediaries and German companies being thought to be involved. Passed on to the BND." *Id.* at 58-59.

51. *Policy Statement of Dr. Wolfgang Schauble: Hearings of the Senate Comm. on Foreign Relations, 101st Cong., 1st Sess. 110, 111 (1989)* [hereinafter *Schauble Statement*]. Dr. Schauble was Federal Minister for Special Tasks and Chief of the Federal Chancellery. His statement was made to the Bundestag on February 17, 1989.

Chemie, Dr. Wolfgang Schauble told the Bundestag:

Although Imhausen possessed the expertise to supply all kinds of chemical plants, including ones needed for the manufacture of warfare agents, there were *no signs whatsoever* of Imhausen being involved in such a project In May of 1988 the Federal Government received from the United States the *first indication* of participation by Imhausen in the construction of a chemical weapons plant in Libya.⁵²

In November 1988, impatient United States authorities reported the allegations against Imhausen-Chemie to the highest levels of the West German government. Dr. Schauble reported “[O]n 15 November, Chancellor Kohl and Foreign Minister Genscher received during their talk with Secretary of State Shultz in Washington information from CIA Director Webster on the participation by German companies, including Imhausen and IBI.”⁵³

Six weeks later, the United States press took over the campaign to move the West German government into action. *New York Times* columnists Stephen Engleberg and Michael Gordon broke the detailed story on January 1, 1989. William Safire, a prominent journalist, sounded the rallying cry in a *New York Times* editorial the following day, calling the Rabta facility “Auschwitz-in-the-sand.”⁵⁴ “The moral reaction from West Germans with consciences, including journalists, is to demand the whole truth quickly. Who broke the laws and what government officials turned a blind eye? Why did Bonn’s higher-ups procrastinate for six months?”⁵⁵

The Bonn government suggested not only that it had been caught in the crossfire of former United States President Ronald Reagan’s personal vendetta against Libyan leader Qaddafi, but also that the United States was deliberately trying to embarrass Foreign Minister Hans Dietrich Genscher because of his stand favoring a global ban on chemical weapons.⁵⁶ The West German press wasted no time taking up Safire’s challenge. In the days preceding the Paris Conference, journalists not only revealed the details of Imhausen-Chemie’s participation in the Rabta project, but also that of other West German com-

52. *Id.* at 111-12 (emphasis added).

53. *Id.* at 113. IBI was a firm managed by Dr. Ihsan Barbouti, who served as a middleman for the construction of the Rabta plant. See Jesse Birnbaum, *Chemical Weapons: The Mysterious “Doctor B.”* TIME, Feb. 27, 1989, at 40.

54. William Safire, *The German Problem*, N.Y. TIMES, Jan. 2, 1990, at 23.

55. *Id.*

56. *That German Innocence*, *supra* note 35, at 45.

panies and their brokers. The West German Parliament ordered a full report to be delivered in February 1989. This began an energetic effort to enact laws strong enough to prevent the export of chemical warfare technology, and laws extensive enough to allow West German authorities to police exports effectively.⁵⁷

Whether the West German government was protecting sensitive intelligence sources,⁵⁸ acting under due process constraints,⁵⁹ running interference for West German corporations,⁶⁰ or simply dragging its feet, only an extraordinary and concerted outpouring of disapproval spurred the West German government to action. To those who believe the only hope of curbing chemical weapon proliferation was to cut off the source of the technology, the Imhausen-Chemie episode was daunting. West German enterprises dominated the list of foreign companies aiding the transfer of chemical weapons technology,⁶¹ followed by Italy⁶² and Japan.⁶³ In response, the United States Congress attempted to regulate the activities of countries involved with the Third World chemical weapons technology market.⁶⁴ Since Congress

57. See also *Report to the Bundestag*, *supra* note 22, at 88-104 (describing the legislative and executive changes proposed by the Bonn government to remedy the situation).

58. *Report to the Bundestag*, *supra* note 22, at 51.

59. *Schauble Statement*, *supra* note 51, at 112.

60. See *Rabtagate*, *supra* note 23, at 5.

61. In 1990, United States officials complained that West Germany waited until the United States prodded them before they would investigate West German companies suspected of shipping restricted exports to Iraq, with few convictions resulting. For example, the United States learned that H&H Metalform, Ltd. of Drensteinfurt was sending machinery to build high-speed centrifuges for the enrichment of uranium. West German officials investigated but decided that H&H had broken no laws because the specific type of machinery was not on the export license list. Observers suggest that West Germany "may feel pressure to increase lucrative exports to the Middle East to pay the enormous costs of reunification." Louise Lief & Michael Wise, *Inside Bonn's Middle East Arms Bazaar*, U.S. NEWS & WORLD RPT., May 28, 1990, at 41.

62. An Italian company, Technipetrole, was involved in nerve gas plant construction. See 136 CONG. REC. S17,179 (1990).

63. See David Sanger, *Toshiba Supplied Libyan Factory*, N.Y. TIMES, Feb. 17, 1989, at A11. Mitsubishi Heavy Industries allegedly sent 50 Japanese technicians and engineers to the Rabta facility to install metal-machining equipment for making bomb canisters. *The World*, L.A. TIMES, Mar. 9, 1989, at A2.

64. The positive effect on West German policy continued when the West German government vowed to prosecute West German firms providing technology to Iraq. Eighteen West German firms are suspected and five are under investigation, including Karl Kolb, which has been under investigation since 1987 without judgment. Unified Germany now must contend with East German firms that provide help. Messerschmitt-Bolkow-Blohm was involved in the Condor missile project which provided Iraq, Egypt, Argentina, and Romania with technology to develop a 600-mile range missile. Such a missile is necessary to deliver a tactical chemical pay-load. Technicians of the giant Messerschmitt formed a Swiss-based company, Consen, to

wanted more "teeth" in the United States legislation than the Bush Administration was prepared to accept, this attempt was quickly frustrated.⁶⁵

C. *Stones and Glass Houses: United States Suppliers*

As Paul Freedenberg, then United States Under-Secretary of Commerce for Export Administration, said "I live in fear of the day when the German Ambassador may come in here and say that Bonn has found an American company selling chemical weapons materials to the Middle East."⁶⁶ One incident brought this prospect uncomfortably near.⁶⁷

Called a precursor chemical,⁶⁸ thiodiglycol is one of the critical

continue the Condor work after 1985. Yet another West German company, Gildermeister Projecta, was involved in the development of a military research center to produce missiles and aircraft in the Middle East. Lutz Stavenhagen, coordinator of Germany's intelligence services, promised, "Justice will be seen to be done." Eisenhammer, *supra* note 47, at 6.

65. Meanwhile, West German firms under fire for providing technology to Iraq have complained of a double standard. Edzard Reuter, head of Daimler-Benz, stated that it was politically acceptable to help Iraq in the "first Gulf war" with Iran. "Nowhere in Germany is there an economic term about which there is so much hypocrisy, cowardice and opportunism as arms exports," Reuter said. Ian Murray, *New Bonn Curbs on 'Exporters of Death,'* THE TIMES (London), Jan. 29, 1991 available in LEXIS, Nexis Library, TTIMES File.

66. Michael Gordon, *Poison Gas Fears Lead U.S. to Plan New Export Curbs*, N.Y. TIMES, Mar. 26, 1989, at 1.

67. See Brian Duffy et al., *From Baltimore to Baghdad*, U.S. NEWS & WORLD RPT., June 4, 1990, at 51.

68. In November, 1989, the United States Commerce Department made effective the official list of precursor chemicals. It also prohibited destinations in accordance with agreements of the Paris Conference. Export licenses would be required for all shipments of the following chemicals:

- Phosphorus trichloride
- Trimethyl phosphite
- Thionyl chloride

Excluded from this requirement were shipments going to NATO countries, New Zealand, Australia, Ireland, Japan, or Switzerland. Shipments of the following were banned to Libya, Iran, Iraq, and Syria:

- Potassium hydrogen fluoride
- Ammonium hydrogen fluoride
- Sodium fluoride
- Sodium bifluoride
- Phosphorus pentasulfide
- Sodium cyanide
- Triethanolamine
- Disopropylamine
- N,N-diethylethanolamine
- Sodium sulfide

Ellen Goldbaum, *More Curbs on Weapons Precursors*, CHEMICAL WK., Oct. 18, 1989, at 22.

ingredients for producing mustard gas.⁶⁹ One ton of thiodiglycol yields one ton of mustard gas.⁷⁰ Alcolac International,⁷¹ a chemical firm based in Baltimore, Maryland, sold small quantities of thiodiglycol for use in making ballpoint pens.⁷² In 1987 and 1988, however, Alcolac provided hundreds of tons of thiodiglycol⁷³ to Nick Defino. Defino's partner in a New York sheetmetal export business, Harold Greenberg, asked Defino to locate and order thiodiglycol. Greenberg was providing the service to Charles Tanaka, an export agent in Japan. Tanaka had been approached by Frans Van Anraat, "a mysterious European businessman who ran a Singapore company that bought and sold chemicals."⁷⁴ Alcolac export manager, Leslie Hinkleman, helped Defino and Greenberg falsify the shipping documents.⁷⁵

Doubting that the chemical was destined to be a "textile additive" for a fabric manufacturer in Singapore, an alert accountant in Alcolac's main office noticed the sudden increase in thiodiglycol shipments.⁷⁶ Alcolac officials stopped shipments intended for Iraq, but indirectly allowed other shipments to Iran because they were labelled for shipment to Singapore, a legally permissible destination.⁷⁷ Realiz-

69. Mixing thiodiglycol with hydrochloric acid produces mustard gas. In 1983, Phillips Petroleum Company of Oklahoma shipped five hundred tons of thiodiglycol "through a Dutch firm, KBS Holland BV, to a 'pesticide' plant in the Iraqi town of Samarra. Only after a second order was delivered in 1984 did Phillips begin to have doubts." Elie Marcuse, *An Equality of Terror*, L'EXPRESS, reprinted in WORLD PRESS REV., Mar. 1989, at 18.

70. Michael Gordon, *U.S. Companies Tied to Chemical Sales*, N.Y. TIMES, Jan. 31, 1989, at A3.

71. At the time of the thiodiglycol incident, Alcolac was a subsidiary of the British holding company, RTZ. *Nerve Gas Precursor Controversy*, CHEMICAL WK., Feb. 8, 1989, at 5.

72. A dual use chemical is regulated through the United States Commerce Department, while a finished product like mustard gas would be considered a munition and regulated by the United States Defense Department.

73. Customs agents stopped one shipment of 120 tons bound for Iran. Nevertheless, a shipment of 520 tons slipped through to Iraq. Duffy et al., *supra* note 67, at 51.

74. *Id.*

75. Moreover, it was revealed that the "U.S. Customs Service arrested an American and a Dutch citizen, both unnamed, on charges of illegally re-exporting thiodiglycol — manufactured in Baltimore — from Antwerp, Belgium to Jordan . . . Jordan is a common transshipment point for shipments to Iraq." *Nerve Gas Precursor Controversy*, CHEMICAL WK., Feb. 8, 1989, at 5. Nu Kraft Mercantile Corporation of New York, an affiliate of United Steel and Strip Corp., ordered more than 500 tons of thiodiglycol. The shipments were sent to Antwerp, Belgium, and Rotterdam, the Netherlands for ultimate customers in Western Europe, but at least three shipments actually went to Jordan. Gordon, *supra* note 70, at A3.

76. See Thom Shanker, *West Underwrites Third World's Chemical Arms*, CHI. TRIB., Apr. 3, 1989, at A1.

77. *Id.* Three shipments of thiodiglycol went to a West German company, Chemco G.m.b.H., and were apparently re-exported to Iran. Gordon, *supra* note 70, at A3.

ing these diversions, United States Customs officials filled the last shipment with water instead of thiodiglycol. The drums were placed on a barge in Baltimore, Maryland, headed for Norfolk, Virginia. From there, the shipment was tracked by satellite as it traveled by freighters to Nova Scotia, Singapore, and Pakistan. The drums sat on a Karachi dock for a time before being loaded for their final destination, a chemical weapons plant in Iran.⁷⁸

Defino, Greenberg, and Hinkleman pleaded guilty and cooperated with federal authorities by luring Tanaka to the United States on a ruse to sell fingerprint technology to United States police.⁷⁹ Tanaka also pleaded guilty. Frans Van Anraat was arrested by Italian authorities.⁸⁰ Alcolac pleaded guilty to knowingly violating export laws⁸¹ and faced a fine of \$1 million.⁸² Not long afterward the French multinational Rhone-Poulenc acquired the company.⁸³

Rhone-Poulenc also acquired portions of Stauffer Chemicals, another United States chemical company with a history of Middle East involvement.⁸⁴ In 1985, Stauffer provided the Swiss firm, Kregs A.G., with a design for a chemical plant identical to its own in Pennsylvania. The proposed plant would produce phosphorous trichloride, a precursor chemical for Sarin. The chemical was intended for El Nasr Pharmaceutical Company of Egypt. When Kregs began development of a second plant, Swiss authorities counseled Kregs to break off talks, and the United States State Department voiced con-

78. Shanker, *supra* note 76, at A1.

79. *Id.*

80. Van Anraat is a Dutch citizen affiliated with Companies, Inc., a Swiss firm. He lived in Italy. Gordon, *supra* note 70, at A3.

81. *Id.*

82. Jack Rubin, a vice president for Alcolac, said the company had cancelled all of its overseas sales of thiodiglycol. "Anyone can trick a legitimate firm and divert these chemicals from their allowed commercial use to chemical weapons. It is like terrorism. It is nigh-on impossible to prevent." Shanker, *supra* note 76, at 1 (quoting Jack Rubin); Tom Shandler, *West Underwrites Third World's Chemical Arms*, CHI. TRIB., Apr. 3, 1989, at 1.

83. *Strategic Developments—1989-1990*, CHEMICAL WK., Jan. 30, 1991, at 39.

84. *Id.* Iraq's first chemical weapons plant was built with United States help in 1978-79. Pfaudler Corporation of Rochester, New York, provided the plans. "Pfaudler [sic] labelled its drawings 'flow charts for a pesticide plant,' but even a novice would have recognized that at least two of the chemicals it was supposed to produce, Amaton [sic] and Paratheaon [sic], could be used to make nerve gas." *Crisis in the Gulf: Terror Arsenal the West Ignored*, THE INDEPENDENT, Sept. 12, 1990, at 9. Though United States Customs refused to grant a license for the requisite machinery from Pfaudler, the plans were delivered, and using parts purchased from various sources in Europe, the Iraqis jury-rigged a chemical weapons plant at a cost of \$60,000,000. *Id.* See also BURCK & FLOWERREE, *supra* note 30, at 65 (providing a detailed analysis of substantial public information about chemical weapons).

cern to the Egyptian ambassador.⁸⁵

Even with aggressive criminal investigations by the United States Customs Service, officials say the odds of uncovering such conspiracies are low.⁸⁶ Alert informants play a key role. For example, in *United States v. Reed*,⁸⁷ suspicions were raised when Iranians tried to order chemical warfare protective suits, in violation of export licensing requirements for items on the United States Munitions List.⁸⁸ Notably, the purchaser required "that the suits not be made by persons of the Jewish faith."⁸⁹ In other cases, purchasers customs officials noticed that the requested air freight shipments costing five times as much as sea transport.⁹⁰

Moreover, investigations are thwarted by the fluidity in the prescribed list, the confusion over which destinations are illegal,⁹¹ and

85. Michael R. Gordon & Stephen Engelberg, *Poison Gas Fears Lead U.S. to Plan New Export Curbs*, N.Y. TIMES, Mar. 26, 1989, at A1. Another source of proliferation is government-to-government assistance. The Australia Group, composed of 22 free world nations, aims to control proliferation. However, its task is difficult as many nations are willing to provide technology and precursors for a price.

India presents a case in point. After Transpek Private Ltd., a state-owned trading agency, shipped 60 tons of thionyl chloride to Iran, a precursor for mustard gas, the United States pressured India to cancel the second order of 257 tons. Transpek dramatically increased its output of thionyl chloride from 150 tons in 1979 to 2203 tons in 1987. A West German company, Rheineisen, placed the order with Shatef Trading in Dubai. Shatef Trading, in turn, placed the order with Transpek Private. The cargo was loaded and ready to sail on June 30, 1989. United States Secretary of State James Baker raised the issue with West German Foreign Minister Genscher on June 21, 1989, and provided details in a June 24, 1989 letter. West German authorities promptly raided Rheineisen. On the basis of evidence found, the West Germans appealed successfully to the United Arab Emirates to block the shipment. Characterizing export restrictions on dual-use chemicals as "colonialism," Indian officials publicly resisted pressure to conform to the goals of the Australia Group. See Stephen Engelberg & Michael R. Gordon, *India Seen As Key On Chemical Arms*, N.Y. TIMES, July 10, 1989, at A1.

Likewise, China briefly entered the precursor market, but when the Bush Administration protested China halted all shipments. Bill Gertz, *Chinese Move Seen as Aiding Libya in Making Poison Gas*, WASH. TIMES, July 12, 1990, at A6. Moreover, evidence suggests that at least one former Warsaw Pact member provided finished products, not precursors, to Libya. "Czechoslovakia's ousted Communist Government had shipped 1,000 tons of lethal Semtex explosives to Libya." Gary Milhollin & Jennifer Weeks, *Poison Gas Laws: Still Leaking*, N.Y. TIMES, Mar. 25, 1990, at D19.

86. Templeman et al., *supra* note 30, at 51.

87. 790 F.2d 208 (2d Cir. 1986).

88. See 18 U.S.C. § 371, 22 U.S.C. §§ 2778(b)(2), 2278(c) (1990).

89. *Reed*, 790 F.2d at 209.

90. See *Foreign Relations Hearings*, *supra* note 19, at 209 (testimony of Dr. Will D. Carpenter, Chairman of the Chemical Manufacturers Association Work Group on Chemical Weapons).

91. The number of chemicals on the control list has grown rapidly over the last two years. Ten chemicals were added in 1990, and two more in 1991. See 54 Fed. Reg. 52,017 (1990).

the willingness of unscrupulous brokers to provide false shipping documentation. These factors allow shipments of precursor chemicals to slip through United States customs.⁹² A senior United States official stated:

We know this is not the only case. We just don't know how many more cases exist More often than not, we are outgunned and outfinanced. We are dealing with finite resources. Unfortunately, the bad guys are told that they will get whatever it takes to get the job done.⁹³

While export controls recently have been tightened for precursor chemicals, opportunities still remain for the enterprising conspirator. Controls for the export of equipment, technology, or expertise for chemical weapons related development exist under United States law, but they are newly enacted, hotly contested, and untested. Though West Germany, following the Imhausen-Chemie debacle, aggressively addressed this flaw in their export laws by passing tough export legislation, the United States has lagged behind. While United States law enforcement and intelligence agencies may aggressively pursue those United States citizens who attempt to supply weapons-grade precursor chemicals, little can be done to those United States citizens who arrange deals overseas for foreign materials for third world gas plants.

D. Chemical Weapons Brokers

Peter Walaschek, a Czechoslovakian pharmacist, was one of the co-conspirators arrested when the United States Customs Service

92. Admiral Thomas E. Brooks, director of Naval Intelligence, told Congress that Egypt, Israel, India, Pakistan, North Korea, Taiwan, China, and Ethiopia should be included on the proscribed destination list for critical precursor chemicals. Gordon & Engelberg, *supra* note 85, at A1.

93. Shanker, *supra* note 76, at 1. Some enterprising merchants attempted to sell finished chemical agents. William Von Raab, Commissioner of the United States Customs Service, described the following case in testimony to Congress:

On January 12, 1989, United States Customs agents arrested Juwhan Yun, President of Komax International, Short Hills, New Jersey [A] [United States] citizen of Korean descent, . . . Yun began to negotiate with a Customs undercover agent to purchase and illegally export [S]arin Yun was [also] attempting to purchase 500 mark 94 bombs, each would have contained 108 pounds of [S]arin [which is] controlled under category XIV(a) of the [United States] munitions list The complexity and sensitivity of this investigation required the cooperation of a number of U.S. and foreign law enforcement agencies. Assistance was provided by the Department of Defense, United States Army, Navy, the Naval Investigative Service, Her Majesty's Customs and Excise and the Customs Service, located in London, Paris, Seoul, Honolulu and Los Angeles.

Governmental Affairs Hearings, supra note 7, at 130.

closed in on Alcolac International.⁹⁴ Walaschek explained his system to authorities before he forfeited his bond and fled the country. Chemco, a subsidiary of Walaschek's German company, Colimex, was set up expressly to take international shipments which it would later send through to restricted Middle Eastern destinations, such as Iran.⁹⁵ Together with Van Anraat and Tanaka, Walaschek's transshipping companies represented one of the many brokerage systems believed to be working in Europe.

Ihsan Barbouti, a former architecture professor at Baghdad University and a multimillionaire with interests in Switzerland, Greece, Thailand, and the Middle East, filled the broker's role for Libya's Rabta chemical plant.⁹⁶ While under contract with Libya, Barbouti established Ihsan Barbouti International ("IBI"),⁹⁷ a company designed to purchase everything needed to construct the Pharma 150 project at Rabta. These purchases included Japanese desalinization and electrical equipment, plastic molding and precision machining plants, and a foundry procured from a Danish firm. Barbouti boasted to a friend that one Rabta contract was worth nearly \$2 billion.⁹⁸ Though German authorities raided IBI's Frankfurt office in January 1989, Barbouti remained undisturbed and journalists easily located him in London for a candid interview the next month.⁹⁹ In spring 1990, Barbouti suddenly died in London, while federal authorities were investigating an operation in Boca Raton, Florida, designed to export cyanide to Iran. The plan had been masterminded by Barbouti.¹⁰⁰

Monzer Al-Kassar is another of these brokers. Intelligence re-

94. Shanker, *supra* note 76, at 1; *West Underwrites Third World's Chemical Arms*, *supra* note 82, at 1.

95. See Stephen Engelberg & Michael R. Gordon, *Iran Stockpiles Chemical Arms With West's Help*, CHI. TRIB., Jan. 29, 1989, at A1. Evidence suggests Chemco was working under the supervision of an Iranian diplomat in Bonn. Gordon, *supra* note 70, at A3.

96. Birnbaum, *supra* note 53, at 40.

97. IBI's subsidiaries included "IBI Engineering in Frankfurt and several letter box companies in Switzerland." Templeman et al., *supra* note 30, at 51. Imhausen-Chemie's off-shore subsidiaries were located in Switzerland and Liechtenstein. *Id.* The Swiss connection provided the route of payment. *Id.*

98. *Id.*

99. Birnbaum, *supra* note 53, at 40.

100. Alan Friedman et al., *The Sinister Alchemy of the Iraqi "Doctor,"* FIN. TIMES, July 3, 1991, at 4. The company was called Product Ingredient Technology ("PIT"). Its plant was staffed by Spanish and Arabic-speaking workers, while the supervisors arrived in chauffeured Jaguars with armed body guards. The plant purportedly produced a food flavoring known as bitter almond oil. *Id.* The shipper alerted the CIA when the plant attempted to ship 1500 pounds of its product to Houston where it was to be loaded on a ship bound for Jordan, and

ports consider this multimillionaire Syrian to be the most successful private arms dealer in the world.¹⁰¹ “[U]sing Syrian and Brazilian passports . . . he [has been] spotted by United States intelligence in Budapest, Damascus and Kuwait.”¹⁰² Al-Kassar reportedly provided vast amounts of arms outside the government-to-government network, including to terrorist groups and governments such as Iraq. Chemical weapons represent merely one more product line which military arms brokers offer to their customers. Past experience suggests that this private market is “largely beyond the control of mechanisms established by the United States and other Western countries to prevent the spread of mass weapons of destruction to the Third World.”¹⁰³

“I’m flabbergasted at how good and quick [the Germans have] become [at uncovering brokerage arrangements],” said a diplomat familiar with the problems of brokering and transshipping.¹⁰⁴ Despite stricter export laws, increases in personnel, and greater cooperation between investigating agencies, observers admit that false declarations of destination, coupled with a multitude of circuitous routes to the Middle East, render uncovering the conspiracies very difficult. Therefore, enthusiasm for a more concerted effort, perhaps through controls instituted by the European Economic Community, is growing.¹⁰⁵

Understanding the market forces engendering proliferation of chemical weapons is necessary to appreciate the practical problems governments face in attempting to curtail that proliferation. How this economic structure operates is only half the story, however. To appreciate the intensity and ingenuity with which the participants continue to advance their goals, an understanding of the product is also essential.

II. THE DEADLY ATTRACTION OF POISON GAS

A white cloud hung in the cold Flemish mist, momentarily turning yellow-green as it began to drift. Allies and Germans alike watched with awe as the cloud inched toward Ypres that April morn-

ultimately Iraq. This was apparently to be a trial run for a larger operation. *Id.* Some of Barbouti’s associates believed that he faked his death. *Id.*

101. James Adams, *Arms and the Salesmen*, WASH. POST, Jan. 27, 1991, at C1.

102. *Id.*

103. *Id.*

104. Francine S. Kiefer, *Bonn To Tighten Export Controls*, CHRISTIAN SCI. MONITOR, Jan. 29, 1991, at 4.

105. *Id.*

ing in 1915.¹⁰⁶ Carrying chlorine released simultaneously from thousands of pressurized cylinders, that cloud ushered in the era of chemical warfare. Over the next three years, chemists refined the agents, eventually replacing chlorine with Phosgene. Both sides advanced the delivery system from cylinders opened by hand to artillery shells. The Allies introduced mustard gas on the battlefield in 1917, thus escalating the chemical weapons race from transient inhalation agents to persistent skin exposure agents.

A. Prologue to Paradox

Even while the civilized world forswore chemical weapons, chemists devised even more deadly chemical compounds. The requirements for a chemical weapons program, however, remain fundamentally unchanged today since World War I. Whether the chemical agent is temporarily debilitating or instantaneously lethal, a chemical weapon still requires favorable weather and terrain, a reliable delivery system, and an unprepared target for maximum effectiveness.

"Chemical . . . agents are simultaneously the most sinister yet beckoning agents of human destruction."¹⁰⁷ Often called the "poor man's atom bomb," chemical agents weigh heavily in the balance of power, providing the possessor government clout with its neighbors. In the Middle East, where only Israel possesses nuclear capability, chemical weapons hold special attraction as potential equalizers. Among nations that believe themselves ignored by the superpowers, a large chemical arsenal becomes a show of strength, as much for domestic ego inflation as for international status.

1. European Disillusion

Chemical warfare did not shock western European nations so much as it exasperated them and prompted the signing of the Geneva Protocol of 1925.¹⁰⁸ The gas program of World War I was largely a military failure.¹⁰⁹

Poison gas's greatest value remains a psychological one. Ironically, the psychological advantage of poison gas also constitutes its inherent flaw. Historically, the same morale crisis created by the use

106. See L. F. HABER, *THE POISONOUS CLOUD* 34 (1986).

107. JOSEPH D. DOUGLASS, JR. & NEIL C. LIVINGSTONE, *AMERICA THE VULNERABLE* 1 (1987).

108. For the text of the Geneva Protocol of 1925, see *supra* note 9.

109. HABER, *supra* note 106, at 34.

of poison gas precipitated the quick response to develop defenses.¹¹⁰ Each newly developed defense engendered the need for more novel chemical agents. This reciprocating escalation of agent and defense eventually resulted in a stalemate. Even though gas was inexpensive and easy to use in battle, it was a resounding tactical letdown, a novelty tried by World War I commanders and rejected. The escalation of chemical agents and defensive measures "was outside the regular officer's frame of reference."¹¹¹ A sound set of gas related war tactics never developed during World War I¹¹² because "the trouble was, generally speaking, chemists and soldiers did not get [along]."¹¹³ Nevertheless, poison gas captured many imaginations and took on a life in myth that it never possessed on the battlefield.

2. Multiple Regression Equation as Metaphor

Factoring each variable into the equation of chemical warfare requires that each be assigned a weight predicated on the interaction of that variable with all the others. Two answers emerge from this "multiple regression" analysis. First, the equation yields an estimate of the probability of chemical weapons use. A realistic assessment of this probability suggests the level of urgency with which nations should prosecute programs to curb proliferation. Second, the equation reveals whether any variable or combination of variables will show up as a significant determinant of that probability. Isolating the significant determinants allows efforts for curbing proliferation to pinpoint prophylaxis for greatest efficacy.

B. Variables: Agents, Properties, and Effects

Except for the addition of nerve agents, the known chemical weapons arsenal remains unchanged since the Europeans agreed that gas was ineffective on the battlefield. Most sources list four classifications of poison gases.¹¹⁴ These standard categories include choking agents, blister agents, blood agents, and nerve agents. Technically, three more classes conclude the list, including the smokes, incapacitants, and riot control agents. Understanding these gases' origins,

110. *Id.* at 275. Haber reports that "voluntary disablement" by troops with mustard gas may also have exasperated commanders. *Id.* at 276.

111. *Id.* at 266.

112. *Id.* at 270.

113. *Id.* at 273.

114. Colleen A. Nash, *Chem-War in the Third World*, AIR FORCE MAG., Jan. 1990, at 80.

chemical descriptions, physiological effects, lethal doses,¹¹⁵ and persistence is essential in determining why governments remain enthusiastic about possessing them in their arsenals.

1. Choking Agents

To produce Phosgene, manufacturers pass equal volumes of chlorine and carbon monoxide over charcoal.¹¹⁶ Phosgene represents one of the original World War I poison gases; it produced eighty percent of that war's gas casualties.¹¹⁷

Phosgene is a colorless gas, called agent CG in the United States Army code,¹¹⁸ and it smells like newly mown hay. It kills by attacking the delicate tissues of the respiratory system, inducing spasmodic coughing followed by retching and fatal pneumonia.¹¹⁹ The lethal dose of Phosgene is 3200 milligrams (mg) per cubic meter (m³) in one minute (min).¹²⁰

Of the choices available to German chemical warfare specialists in 1915, Phosgene emerged "by elimination, as the most suitable" because its molecular weight exceeds chlorine's. Phosgene was thus less likely to drift upwards and away from the battlefield.¹²¹ Further, because Phosgene's boiling point and vapor pressure are lower than that of either chloropicrin,¹²² diphosgene,¹²³ or hydrogen cyanide,¹²⁴ Phosgene diffuses into the air better than the alternatives.¹²⁵

Other choking agents include chlorine, trichloromethyl

115. J.B. NEILANDS ET AL., *HARVEST OF DEATH: CHEMICAL WARFARE IN VIETNAM AND CAMBODIA* 9 (1972). Lethal doses are calculated by the number of mg-min/m³; that is, how many milligrams (mg) per minute (min) over how many cubic meters (m³) will kill half of all breathing animals (LD₅₀). *Id.*

116. HABER, *supra* note 106, at 84.

117. J. Perry Robinson, *Chemical Weapons*, in *CBW: CHEMICAL & BIOLOGICAL WARFARE* 33 (Steven Rose ed., 1968).

118. The formula for Phosgene is COCl₂. *See id.* at 32.

119. *Id.*

120. *Id.* at 33.

121. HABER, *supra* note 106, at 41-42.

122. Chloropicrin is a vomiting agent. *See infra* notes 192-95 and accompanying text.

123. Diphosgene is actually trichloromethyl chloroformate. HABER, *supra* note 106, table 4.1.

124. Hydrogen cyanide is virtually impossible to deliver in uniformly lethal concentrations, thus the agent was never a serious contender in the German arsenal. *Id.* at 42. Nevertheless, because cyanide is universally recognized as a deadly poison, the mere mention of hydrogen cyanide evokes deep psychological revulsion. Therefore, hydrogen cyanide continues to appear on lists of credible chemical weapons.

125. *Id.* When cold weather prevented Phosgene from vaporizing, the Germans added chlorine as anti-freeze.

chloroformate, and disulphur decafluoride.¹²⁶ “[Choking agents] are unlikely to be used in modern chemical war, for their initial irritancy or smell immediately warns of their presence, and gas masks can be donned before a lethal exposure.”¹²⁷ In fact, gas mask technology during World War I was more advanced than the chemical weapons technology because industry moved to protect workers as chemical processes were introduced into plants.¹²⁸ The rapid adaptation of respirators for combat equipment was an expected development. Once gas mask training was universal, Phosgene and the other choking agents lost their strategic value.

The harmful potential of choking agents, however, remains deeply embedded in the collective psyche. Some commentators pointed to the aftermath of the industrial accident at Bhopal, India in 1984 as an example of this potential where the target is an unprepared civilian population. In a matter of hours, at least 3000 people died when methyl isocyanate, a compound used to make pesticide, escaped into the atmosphere.¹²⁹

2. Blister Agents

Alcohol, bleaching powder, and sodium sulfide represent the essential ingredients for mustard, the most well known vesicant, or blister agent. As Dr. Matthew Meselson, a Harvard University biochemist, told Congress in 1989, “the technical fact is a government that wants to make mustard gas can do so, even without outside help.”¹³⁰ Though technically an incapacitating, rather than a lethal agent, mustard is an oily liquid with a faint garlic smell which causes intense irritation to all tissue it contacts. In high concentrations, the various formulations¹³¹ of mustard kill by destroying lung tissue. Sesqui-mustard burns or blinds at an exposure of less than 50 mg-min/m³ and kills if inhaled (as an aerosol) at dosages of 200 mg-min/m³.¹³²

126. Robinson, *supra* note 117, at 21.

127. *Id.*

128. See HABER, *supra* note 106, at 16.

129. See PAUL SHRIVASTAVA, BHPOL: ANATOMY OF A CRISIS 42-48 (1987).

130. S. REP. NO. 166, 101st Cong., 1st Sess. 199 (1989) (statement of Dr. Matthew Meselson).

131. Bis (2-Chloroethyl) Sulfide is distilled mustard and still the most important formulation. Robinson, *supra* note 117, at 22.

132. M.L. Burnstall, *The Industrial Context of Chemical Warfare*, in STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE, THE CHEMICAL INDUSTRY AND THE PROJECTED CHEMICAL WEAPONS CONVENTION 35 (1986).

Sulphur and nitrogen mustard are made by three different processes,¹³³ each of which developed during World War I. Germany used both the monochloride route and the thiodiglycol route.¹³⁴ The British used the dichloride route,¹³⁵ combining ethylene with chlorinated sulphur and the thiodiglycol route.¹³⁶ The thiodiglycol method, known as the Meyer method, is "probably the most widespread large-scale route to mustard gas, finding its most recent application in mustard [gas] used by Iraq against Iran."¹³⁷

To produce nitrogen mustard gas, bis or tris(ethanol)amine replaces thiodiglycol. The preferred chlorinating agent is thionyl chloride.¹³⁸ During World War II, the United States arsenals at Edgewood, Huntsville, and Rocky Mountain produced 92,000 tons of mustard.¹³⁹

The precursors of mustard are relatively common industrial chemicals that require few additional steps to yield mustard.¹⁴⁰ Ethylene¹⁴¹ represents the basic industrial chemical, with annual world output exceeding 50 million tons.¹⁴² Hydrogen chloride also is widely manufactured.¹⁴³ While the basic chemical building blocks of mustard are universally available and impossible to control, the chlorinating or sulphochlorinating agents are less widely available. Thus, thionyl chloride and chlorides of sulphur are easier to track through the international market. On the other hand, since they are easier to make, the possibility that renegade nations may secretly produce them remains.¹⁴⁴

A country wishing to covertly produce its own mustard would create suspicion by suddenly importing large quantities of ethylene or chlorides of sulphur, assuming no domestic use exists in a plastics or

133. Other ways to produce mustard gas are possible, but probably cost prohibitive. J.P. Perry Robinson, *The Chemical Industry and Chemical-Warfare Disarmament: Categorizing Chemicals for the Purposes of the Projected Chemical Weapons Convention*, in STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE, *THE CHEMICAL INDUSTRY AND THE PROJECTED CHEMICAL WEAPONS CONVENTION* 55 (1986) [hereinafter *The Chemical Industry*].

134. Burnstall, *supra* note 132, at 39.

135. $C_2H_4 + SCl_2$ or $S_2Cl_2 \rightarrow (ClCH_2CH_2)_2S$. *Id.* at 39.

136. $(HOCH_2CH_2)_2S + HCl \rightarrow (ClCH_2CH_2)_2S$. *Id.*

137. *The Chemical Industry*, *supra* note 133, at 73.

138. $2N(CH_2CH_2OH)_3 + 3SOCl_2 \rightarrow 2N(CH_2CH_2Cl)_3 + 3H_2O + 3SO_2$. *Id.*

139. *Id.* at 91.

140. See *infra* note 206 and accompanying text.

141. The formula for ethylene is C_2H_4 .

142. Burnstall, *supra* note 132, at 39.

143. *Id.*

144. *Id.* at 40.

rubber industry.¹⁴⁵ Thionyl chloride imports could perhaps be justified for pesticide production.¹⁴⁶

Mustard's advantage over Phosgene is that complete cover, as well as a gas mask, is required for effective defense. Another advantage is mustard's relative persistence in the field;¹⁴⁷ the residue can persist for days in sheltered areas even after rain.¹⁴⁸ In 1917, bleaching powder was the universal antidote for mustard because it broke down the residue. Mustard decontamination became a serious problem during 1917, beginning a long era of experimentation in order to determine which sort of gear might be both protective and practical for battlefield conditions.¹⁴⁹

Lewisite spawned one of the earliest antidotes to mustard.¹⁵⁰ Lewisite, another agent in the blister or vesicant category, is an arsenic agent. Like mustard, lewisite has its irreparable effect within minutes. Nevertheless, unlike almost odorless mustard, Lewisite's sharp odor provides a warning to don protective clothing.¹⁵¹

3. Blood Agents

Even though World War I field commanders experienced repeated frustrations in deploying hydrogen cyanide and cyanogen chloride, these chemicals remain in the chemical weapons program. When inhaled, they enter the blood stream and replace oxygen.

Hydrogen cyanide is a colorless gas with the odor of bitter almonds. In peacetime, it is used in the production of chemical intermediates in synthetic fiber, plastics, nitrites, and cyanide salts manufacturing. It is also used to fumigate ships, trains, buildings, orchards, tobacco, and food products.¹⁵² Other sources of hydrogen cyanide include petroleum refining, electroplating, and metallurgic and photographic developing operations.¹⁵³

Cyanogen is also colorless but emits a more pungent odor of almonds than does hydrogen cyanide.¹⁵⁴ Besides military weapons use,

145. *Id.*

146. *Id.*

147. HABER, *supra* note 106, at 117.

148. *Id.* at 201.

149. *Id.* at 202.

150. Robinson, *supra* note 117, at 22. Lewisite now has diminished importance. *The Chemical Industry*, *supra* note 133, at 66.

151. *Id.*

152. *Cyanide*, POISON MANAGEMENT, available in MICROMEDEX (66th ed. 1990).

153. *Id.*

154. *Id.*

cyanogen and cyanogen halides are used as fumigants, as fuel gases for cutting and welding, and as rocket or missile propellants.¹⁵⁵

In early November 1990, a cyanide spill contaminated a stretch of the Western Dvina (also known as the Daugava) River in Latvia. By all reports the spill originated in a weapons plant producing cyanogen.¹⁵⁶ Though not as lethal as Phosgene, the blood agent cyanides act faster and are more difficult to combat.¹⁵⁷ Iran reportedly employed blood agents in its gas warfare against the Iraqis. At least one reputable study ascribes Kurdish civilian casualties at Halabjah to Iranian, not Iraqi, blood agents.¹⁵⁸

4. Nerve Gases

Developed by the Germans in the 1930s, anticholinesterase agents, or nerve gases, are grouped in the United States code as three G-agents, Tabun, Sarin, and Soman, and the V-agents. Anticholinesterase agents block "the enzyme which the body uses to destroy one of its chemical nerve signal transmitters after it has done its job."¹⁵⁹ Two deadly effects follow: "[C]ontrol is lost over the affected part of the nervous system," and as the transmitter, a powerful poison itself, builds up, the body is "forced to poison itself."¹⁶⁰

a. Tabun

Though deadly, Tabun is the least toxic of the three G-agents. Tabun was first produced on a large scale in 1942. Tabun's advantages include persistence in the field and easy manufacture. Tabun represented the preferred nerve gas in the Iraqis' chemical weapons development program.¹⁶¹ Not only will Tabun provide a vapor hazard for several days after dissemination, but if destroyed by hydroly-

155. *Id.*

156. James Rosen, *Cyanide Spill Poisons River in Latvia*, UPI, Nov. 14, 1990, available in LEXIS, Nexis Library, UPI File. At least five tons of acetone cyanohydrin escaped from the Polimer defense factory in Novopoltsk, killing more than 300,000 fish and polluting the drinking water. Damage estimates ranged from \$34 million to \$510 million. *Id.*

157. Robinson, *supra* note 117, at 22. By World War II, blood agents had replaced Phosgene in most arsenals. *Id.*

158. *News Chronology*, 11 CHEMICAL WEAPONS CONVENTION BULL., Mar. 1991, at 5 (discussing a study conducted by the United States Army War College Strategic Studies Institute). For a detailed description of the confusion over the facts of the Halabjah incident, see BURCK & FLOWERREE, *supra* note 30, at 126-29.

159. Robinson, *supra* note 117, at 23.

160. *Id.*

161. Harvey J. McGeorge, *Chemical Addiction*, DEF. & FOREIGN AFF., Apr. 1989, at 16.

sis, Tabun produces hydrogen cyanide. When Tabun is treated with decontaminating solutions, it provides another lethal poison, cyanogen chloride.¹⁶²

Tabun can be manufactured in several ways; three are unclassified.¹⁶³ The published recipe for 100 tons of Tabun is 25 tons ammonia, 60 tons methanol, 30 tons sodium cyanide, 134 tons phosphoryl chloride, and 37 tons ethanol, absolute.¹⁶⁴ One variation is a combination of ammonia, methanol, ethanol, and phosphorus oxychloride.¹⁶⁵ The lethal dose of Tabun is 150 mg-min/m³ for inhalation, but for skin absorption the lethal dose is 1500 mg per person or roughly thirty "drops."¹⁶⁶

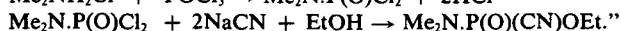
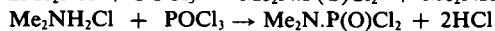
b. Sarin

Sarin, though not as persistent as Tabun, is twice as lethal, requiring only 70 mg-min/m³ for LD₅₀ by inhalation.¹⁶⁷ Once Sarin splashes to the ground, it quickly evaporates, except in very cold weather.¹⁶⁸ Sarin is very difficult to manufacture because of its corrosive properties. During World War II, the Germans produced only a half ton. However, United States chemists solved the corrosion problems in the production process and continued making Sarin.¹⁶⁹ Sarin and its cousins, Soman and VX, are also difficult to make because they contain a methyl group linked to a phosphorus atom, a bond not available commercially.¹⁷⁰

The production of Sarin depends on whether diester or dichlor are the intermediates. The diester method requires diisopropyl methylphosphonate.¹⁷¹ The dichlor method, originated by Gerhard

162. Robinson, *supra* note 117, at 23-24.

163. The method used by Germany during World War II was a "two-stage process starting from phosphoryl chloride and dimethylamine, the latter being produced on-site from methanol and ammonia:



The Chemical Industry, supra note 133, at 74.

164. *Id.*

165. Burnstall, *supra* note 132, at 44.

166. Robinson, *supra* note 117, at 33.

167. *Id.*

168. NEILANDS ET AL., *supra* note 115, at 9.

169. Robinson, *supra* note 117, at 24; *The Chemical Industry, supra* note 133, at 76.

170. Burnstall, *supra* note 132, at 44-45.

171. *The Chemical Industry, supra* note 133, at 75. The final steps of the diester method are:

Schrader, requires methylphosphonyl dichloride.¹⁷² Using the dichlor method, the recipe for 100 tons of Sarin is 510 tons phosphorus trichloride, 145 tons chlorine, 160 tons methanol, 58 tons isopropanol, and 20 tons hydrogen fluoride.¹⁷³ All Sarin routes require the production of phosphorus trichloride through chlorination of elemental (white) phosphorus. Access to elemental phosphorus is crucial for Sarin production.¹⁷⁴

All nerve gases fall into the category of organophosphorus compounds, each requiring elemental phosphorus, a compound available worldwide. Of the two methods for extracting phosphorus from phosphate rocks, most producers prefer the "wet" method. "Treatment with sulfuric acid converts the rock to water soluble calcium phosphates or to phosphoric acid."¹⁷⁵ A low ratio of acid to rock yields superphosphate, the mainstay of fertilizer.¹⁷⁶ A high ratio of acid to rock yields phosphoric acid.¹⁷⁷ Both methods are inexpensive and widely used. Though slightly more expensive than the "wet" method, superheating phosphatic rock, coke, and silica produces elemental phosphorus of greater purity.¹⁷⁸ In monitoring the development of Sarin, Soman, and VX in the Third World, authorities agree that the precursors providing access to elemental phosphorus, phosphorus trichloride and phosphorus oxychloride, require the closest vigilance.¹⁷⁹

The manufacturing process for nerve gas is similar to the production of organophosphorus insecticides such as malathion, parathion, and schradan. These insecticides are popular because their short duration keeps them out of the food chain. The third world increasingly consumes organophosphorus insecticides. As the developed nations export the technology and chemistry necessary to produce these insecticides, they are also exporting the expertise that enables the manufac-



Id.

172. *Id.* Schrader's original process was $\text{MeP(O)Cl}_2 + \text{NaF} + {}^i\text{PrOH} \rightarrow {}^i\text{PrO.MeP(O)F}$. *Id.*

173. *Id.* at 76.

174. *Id.* at 77.

175. Burnstall, *supra* note 132, at 40.

176. *Id.* at 41.

177. *Id.*

178. *Id.*

179. *Id.*

ture of nerve gas.¹⁸⁰

c. Soman

Soman is twice as toxic as Sarin. The same chemical routes which produce Sarin eventually will yield Soman. The diester method, however, requires pinacolyl alcohol. Pinacolyl alcohol was the export that first alerted the West German intelligence community in 1985 to Imhausen-Chemie, the West German chemical company implicated in the construction of Libya's Rabta poison gas plant.¹⁸¹ Because pinacolyl alcohol is difficult to obtain and procurement may alert observers, a new producer would probably avoid the diester method for Soman production.¹⁸²

d. V-Agents

The United States code for the most lethal nerve gas is VX; the Swedish code is F. A British chemical corporation, ICI, patented the process for phosphonothiolates in 1955. This blocked a German corporation, Bayer, and one of the originators of nerve gas, Gerhard Schrader, from patenting a later application.¹⁸³ Swedish reports place the lethal dose from two to ten milligrams, an invisible amount for skin absorption. The V-agents are five times more lethal than Soman in inhalation toxicity, and 2000 times more lethal than mustard gas in skin absorption.¹⁸⁴

Shrouded in secrecy until 1971, when the United States declassified the formula, VX has at least eight chemical routes. The "Newport Method" involves transesterification of diethyl methylchlorophosphine, and provides the basis for binary VX munitions. The other methods depend on an intermediate step involving aminoethyl chloride.¹⁸⁵ Curiously, Warsaw Pact scientists were the first to leak the formula for VX. In 1966, two Romanians described VX as ethyl S-dimethylaminoethyl methylphosphonothiolate.¹⁸⁶ In 1967, a Russian described VX as S-dialkylaminoethyl alkyl

180. *Id.* at 43.

181. *See supra* note 26 and accompanying text.

182. *The Chemical Industry, supra* note 133, at 75.

183. Robinson, *supra* note 117, at 24.

184. *Id.*

185. *The Chemical Industry, supra* note 133, at 78-79. In the United States, R'O.RP.OCH₂CH₂NR''₂ is the route "which came to be used in the only plant-scale process thus far described in the open literature, namely the one run by the Army during 1961-67 to produce the present stockpile of VX." *Id.* at 78.

186. *See generally* D. JULEA & I. POPA, REVISTA SANITARA MILITARA (1966).

methylphosphonothiolate. Some observers believe that VX or some similar agent was responsible for the killing of more than 6000 sheep in March 1968 at the Dugway Proving Ground in Utah.¹⁸⁷

5. Other Chemical Agents

In addition to choking, blood, blister, and nerve agents, the chemical arsenal includes a collection of other weapons of varying toxicity. For example, certain forms of white phosphorous producing smoke cause toxic reactions in varying degrees.¹⁸⁸

Among the incapacitants, lysergic acid diethylamide ("LSD") temporarily held the attention of researchers as they contemplated a chemical weapon that might render a combatant unable to fight without inflicting permanent physical injury.¹⁸⁹ However, dosage represents the problem with such chemicals; a chemical weapon should be effective at less than 100 mg-min/m³. If a drug is effective at that low dose, a higher dose will probably be lethal. Because a commander often substitutes quantity for accuracy when delivering chemicals in the field, the probability of delivering a lethal dose is very high. Thus, the special expenditures may be unwarranted, especially when lethal gases are inexpensive and readily available.

A few other incapacitating, non-lethal agents deserve some note. One is a glycolate incapacitant called Agent BZ or 3-quinuclidinyl benzilate, and the other is a group known as the riot control agents, including CN, CS, and DM.

a. Glycolate Incapacitant

Agent BZ slows mental function and causes dizziness, disorientation, and hallucinations. Some surmise that Agent BZ was developed in the search for atropine, the nerve gas antidote.¹⁹⁰ Agent BZ is apparently manufactured by a process involving the "transesterification of the sodium derivative of methyl benzilate with 3-quinuclidinol."¹⁹¹ However, substitutions in the recipe for Agent BZ appear possible. Therefore, if 3-quinuclidinol is listed as a controlled precursor, so should its substitute, N-methyl-4-piperidinol. Further, if methyl benzilate is listed, so should its possible substitutes, including other

187. NEILANDS ET AL., *supra* note 115, at 10.

188. McGeorge, *supra* note 161, at 16.

189. In fact, "[i]ncapacitants of the Fentanyl or Meperidine families may have caused the crash of the C-130 aircraft which killed Pakistani President Zia ul-Haq." *Id.*

190. Robinson, *supra* note 117, at 25.

191. *The Chemical Industry*, *supra* note 133, at 80.

glycolate esters.¹⁹² Sarin, Soman, and VX also have possible substitutes that make it more difficult to control the precursors for those chemical weapons.¹⁹³

b. Riot Control Agents

Whether used for riot control or for troop harassment, agents CN, CS, and DM are irritants "lethal only in very high concentrations."¹⁹⁴ CS, ortho-chlorobenzalmalononitrile, commonly called "tear gas," is the most well known. Technically termed a "lachrymator," CS causes a "burning sensation in the eyes and copious flow of tears, coughing, difficult breathing [and even] nausea and vomiting."¹⁹⁵ Though not persistent, its half life is ten minutes;¹⁹⁶ and a little goes a long way. An amount as small as one part per 10,000,000 may drive even the most determined person away from a permeated area.¹⁹⁷ CS, however, is lethal at 25,000 mg-min/m³.¹⁹⁸ Like the choking agents—Phosgene and chlorine, a respirator and eye mask neutralizes CS. Nevertheless, when used on unprepared civilian populations, especially in extremely close quarters, CS causes casualties.¹⁹⁹

Agent CN, chloroacetophenone, better known as Mace, is another incapacitant with potentially fatal consequences in civilian populations.²⁰⁰ Lethal at 850 mg-min/m³, some Vietnamese civilian fatalities resulted from burning CN grenades which emitted carbon monoxide in closed tunnels and shelters.

Mixing diphenylamine with arsenic trichloride yields agent diphenylaminochlorarsine, or DM. Also known as Adamsite, DM mainly causes vomiting.²⁰¹ Though the lethal measure is 1500 mg 10-min/m³, the effects of "profuse watery nasal discharge, severe pain in nose and chest, sneezing, coughing, nausea, vomiting, [and] depression" disable a target for several hours.²⁰²

192. *Id.*

193. *Id.* at 81.

194. Robinson, *supra* note 117, at 20.

195. *Id.*

196. NEILANDS ET AL., *supra* note 115, at 23.

197. Robinson, *supra* note 117, at 20.

198. NEILANDS ET AL., *supra* note 115, at 23.

199. *Id.* at 23-24.

200. "[A]most all substances . . . can kill if the dose taken into the body . . . is high enough." Robinson, *supra* note 117, at 60.

201. NEILANDS ET AL., *supra* note 115, at 21.

202. *Id.* at 22.

6. Summary: Precursor List

As the foregoing illustrates, chemical weapons are particularly attractive to military powers in developing nations since they provide a lot of killing power. The formulas for the most reliable agents, mustard and Tabun, are known, and their manufacture requires a low level of technological sophistication. With a few exceptions, nations can easily procure the necessary ingredients under the guise of peacetime industrial use. The following table illustrates the critical precursor chemicals and their distance in production steps from a designated chemical weapon:

| Precursor | Production steps away from: | | | | |
|--|-----------------------------|----|-----|-----|-----|
| | H | GA | GB | VX | BZ |
| sulphur monochloride | 1 | - | - | - | - |
| sulphur dichloride | 1 | - | - | - | - |
| thiodiglycol | 1 | - | - | - | - |
| 2-chloroethanol | 2 | - | - | - | - |
| ethylene oxide | 2 | - | - | - | - |
| ethylene | 1-2 | - | - | - | - |
| vinyl chloride | 1 | - | - | - | - |
| dimethylphosphormidic dichlorid | - | 1 | - | - | - |
| methylphosphonyl difluoride | - | - | 1 | - | - |
| isopropyl methylphosphonochloridate | - | - | 1 | - | - |
| ethyl methylphosphonothioate salts | - | - | - | 1 | - |
| methylphosphonyl dichloride | - | - | 1-2 | - | 2 |
| dimethyl methylphosphonate | - | - | 2-3 | - | - |
| dimethyl pyromethylphosphonate | - | - | 2-3 | - | - |
| diisopropyl methylphosphonate | - | - | 2 | - | - |
| diethyl methylphosphonothionate | - | - | - | 2 | - |
| diisopropylaminoethyl ethyl methylphosphonite | - | - | - | 1 | - |
| diethyl methylphosphonite | - | - | - | 2 | - |
| ethyl hydrogen methylphosphonite | - | - | - | 1 | - |
| methyldichlorophosphine | - | - | 2-3 | 2-3 | - |
| dimethyl hydrogen phosphite | - | - | 3-4 | - | - |
| diisopropyl hydrogen phosphite | - | - | 3 | - | - |
| triisopropyl phosphite | - | - | 3 | - | - |
| phosphorus trichloride | - | 3 | 2-5 | 3-4 | - |
| phosphoryl chloride | - | 2 | - | - | - |
| dimethylamine | - | 2 | - | - | - |
| 2-diisopropylaminoethanol | - | - | - | 2 | - |
| 2-dissopropylaminoethyl chloride | - | - | - | 1 | - |
| methyl benzilate | - | - | - | - | 1-2 |
| 3-quinuclidinol | - | - | - | - | 1-2 |

Key: H = mustard, GA = Tabun, GB = Sarin,
VX = V agents, BZ = 3-quinuclidinyl benzilate.²⁰³

The lure of mustard, Sarin, and Soman is obvious because those chemicals requiring more than two steps to the desired poisonous output are luxuries to developing nations without a broad technological base. Likewise, the world community can more easily monitor those less common chemicals which yield a weapon-grade agent after one or two steps. The difficulty, so vividly illustrated in

203. *The Chemical Industry*, *supra* note 133, at 92 (reproduced with permission).

the table, centers on the common precursors readily available—either through commercial import or domestic production—which are only one or two low technology steps from weapons grade.

Mustard ranks highest in the economy of production hierarchy, with Tabun in second place and Sarin close behind. However, the problems of tactical deployment in the field—especially weather conditions, delivery systems, and preparedness of the target—all contribute to the final equation in determining which agent, if any, a commander would ultimately use.

C. Non-Chemical Variables

Mere chemical genius for creating lethal compounds is not enough to wage chemical warfare. The decision of a field commander to use a novel weapon may be based on many quantifiable premises, but often those premises meld into a “gut feeling.” The gut feeling in World War I was wariness; after World War I, it was exasperation which then became contagious anxiety.

1. Variables: Weather and Terrain

Although the specter of a chemical agent blowing back onto the releasing forces represents the most immediate problem, the real wind problem arises if the agent blows away from the target. Phosgene replaced chlorine for just that reason—chlorine is too light and likely to blow away. However, Phosgene reacts to temperature and fails to vaporize in cold weather. In addition, rain significantly reduces the persistence rates of chemical agents. The chemical properties of each agent interact with ambient weather conditions surrounding the target.

The target's topography also influences the efficacy of a chemical agent. The less poisonous agents with the highest rate of persistence are least affected by obstructions such as dense vegetation in the field or large buildings in urban areas. For example, mustard trapped in pockets of cover can continue to harass troops many days after its deployment. But less persistent agents, such as Sarin, might be contained by natural barriers and quickly dissipate.

2. Variable: Delivery Capacity

The graduation from pressurized cylinders to artillery shells represented a major advance in 1916. However, the properties of the ordnance must factor into the chemical equation. The nature of the

payload changed the artillery regimen as well. For example, the explosive heat of ordnance may interfere with the chemical reaction designed to disperse the chemical agent in droplet or vapor form. During World War II, both the Germans and the Allies discovered that artillery shells must be designed for safe charging and weighted differently than high explosives.²⁰⁴ Moreover, the artillery drill itself must be altered in order to deliver units of chemical agent in a pattern most likely to create a low cloud of uniform density over the target. Early in the development of artillery shells for chemical warfare, the problem of the embedded shell appeared. A shell which became buried in debris could not effectively disperse its contents. Therefore, a drill designed to deliver the shell on the surface was quickly devised. Seventy years later, armies recognize that the tell-tale signal of chemical attack is the low percussion of an incoming shell opposed to the loud explosion of a high explosive.

The complexities involved in chemical agent delivery by artillery shells, whether by mortar or howitzer, require special training. In the only large scale deployment of chemical agents, World War I field commanders literally invented drills and tactics as they went along. Today, extensive and rigorous training conducted by the major powers reduces the difficulty of deciding to deploy chemical weapons.

Less sophisticated forces, however, must adjust by returning to the direct application of chemical agents, skipping the problems of ordnance interaction. Aerial spray substituted for dug-in cylinders at Ypres. Victims of the Iraqi attack on the Kurds reported low-flying aircraft prior to the mass death and injury. While the Iraqis used artillery to deliver chemical agents during the Iran-Iraq war, fighters and helicopters delivered agents as well.²⁰⁵

The most publicized concern is that renegade nations will use more sophisticated delivery systems. The major concerns are the SCUD-B and Condor II tactical missiles. In 1989 "Iran and Iraq [were] believed to be working on chemical warheads for their ballistic missiles."²⁰⁶ During the war for Kuwait, Iraq used the SCUD missile without a chemical warhead to inflict damage. Iraq also possesses the

204. White phosphorus shells are easiest to modify for a chemical weapon payload. The Iraqis used white phosphorus shells during the Iran-Iraq war. McGeorge, *supra* note 161, at 16.

205. James Adams, *The Chemical Nightmare*, SUNDAY TIMES, Jan. 27, 1991.

206. *Global Spread of Chemical & Biological Weapons: Hearings before the Senate Comm. on Governmental Affairs and its Permanent Subcomm. on Investigations*, 101st Cong., 1st Sess. 63 (1989) (testimony of W. Seth Carus).

Al-Husayn missile with a 650 kilometer range, as well as the Al-Abbas missile with a 900 kilometer range.²⁰⁷ The capacity to arm these missiles with chemical agents would place major population centers in Israel and Iran under the threat of long range chemical attack.

In 1968, a high probability existed that a SCUD missile "loaded with nerve gas [could] produce 30 per cent casualties among a fully deployed battle group of 1400 men, and within seconds and under almost any conditions."²⁰⁸ By 1989, experts predicted that, "given an urban target one kilometer in diameter, and the right environmental and population conditions, an attack by two SCUD-B missiles armed with nerve agents [such as Sarin, Soman, or VX], casualties of . . . [20] percent would result in a city 300 miles away."²⁰⁹

Nevertheless, skeptics argue that the negative aspects of artillery shell delivery are exacerbated by missile deployment. For example, placing an agent in the most effective location, perhaps in relation to simultaneous launches, becomes more difficult as the target is farther away. Factoring in weather and terrain conditions from greater distances also presents problems. Therefore, the effectiveness of chemically-armed SCUD missiles as attack weapons remains debatable.²¹⁰

The principal question now becomes to what degree urban centers in Israel are vulnerable to a terrorist attack by a hostile neighbor? During the war for Kuwait, Iraq demonstrated the clear capability for such an attack. Yet not one of the SCUD missiles used either against Israeli civilians or Allied troops in the Saudi desert carried a chemical agent. This fact emphasizes the difference between calculating the *possibility* of chemical attack and calculating the *probability* of such attack.

3. Variable: Target's Preparedness

The technological competition between the German and Allied

207. *Id.*

208. Robinson, *supra* note 117, at 34.

209. McGeorge, *supra* note 161, at 16.

210. "[A]n unidentified Iraqi engineer, speaking in Jordan, [said] that 'technical problems' . . . prevent[ed] Iraq from fitting its SCUD missiles with [chemical weapons] warheads." 11 CHEMICAL WEAPONS CONVENTION BULL., Mar. 1991, at 14. The same engineer said, "The SCUD attacks on Israel [on January 18, 1991] have shown that there is a 'large deviation' between the target and the object that was hit. However, this must not happen in the event of a poison gas attack, because such an attack must not hit Jordan. It is difficult to attach a heavy gas container to a warhead without causing ballistic deviation."

Id.

forces in World War I illustrates how technology swiftly neutralizes a newly developed chemical agent. The rapid development of the gas mask, from the original cotton pad soaked in urine to modern breathing sets, gas helmets, and respirators, kept troops one step ahead of weapons development. When the gas mask effectively blocked inhalation agents such as Phosgene, chlorine, and hydrogen cyanide, chemical agents targeted skin absorption, and protective clothing quickly developed.

The Geneva Protocol of 1925 testifies to the stalemate created by these two parallel lines of technology. When facing an opposing army fitted with inhalation and skin absorption protection, a commander must choose between raising the level of lethality, knowing that defensive protection will develop just as quickly, or calling a halt to the escalation. Europeans have chosen to do both. Although European nations forswore the first use of chemical agents in warfare, development nevertheless continues.²¹¹ The Germans' reluctance to employ their stockpiles of sophisticated nerve gases, especially in the desperate period beginning with the Normandy Invasion, is as much an enigma as Saddam Hussein's decision not to use Iraq's stockpiles of nerve gases, even after pointed threats.²¹²

Most observers agree that the answer comes back to the level of protection available to the enemy. One of the most advanced forms of protection is the XM21 Remote Sensing Chemical Agent Alarm manufactured by the Brunswick Corporation.²¹³ Together with the individual Chemical Agent Detector made by Environmental Technologies, the Allied troops in the Desert Storm operation could count on some measure of advanced warning reducing the need to con-

211. See generally FREDERIC J. BROWN, *CHEMICAL WARFARE: A STUDY IN RESTRAINT* (1968).

212. Iraqi President Saddam Hussein told an emergency meeting of the Arab League, "We should announce clearly that if Israel attacks us, we are going to hit back fiercely, and if it uses weapons of total destruction against [the Arab] nation, we will use against it the weapons of total destruction which we have." 8 *CHEMICAL WEAPONS CONVENTION BULL.*, June 1990, at 18. In November 1990, the United States Army issued a 145-page intelligence manual entitled *Desert Shield Order of Battle Handbook*. Concerning Iraqi chemical weapons capability, the manual reports:

Chemical weapons are utilized when planners assess fire support or force size as insufficient to attain the objective. Once authorization for chemical weapons use is given corps commanders are given chemical rounds to be delivered by artillery. Chemical warheads include three types: a lethal mustard agent, an incapacitating agent, and tear gas.

11 *CHEMICAL WEAPONS CONVENTION BULL.*, Mar. 1991, at 5.

213. See *Marines Select Brunswick for Chemical Detector*, *DEFENSE NEWS*, Jan. 28, 1991, at 19.

stantly wear protective gear.²¹⁴ Even if worn constantly, protective gear hampers combat operations very little.²¹⁵ "In the hot desert sun, well trained troops in protective gear have successfully conducted assault exercises for up to two hours."²¹⁶

Given the uncertainties created by the other variables in the equation to predict chemical weapons use, protective gear is probably the most significant. Even if the threat of chemical attack forces an enemy army to operate in cumbersome protective gear, thus reducing their fighting capacity, the reliable killing power of a chemical attack may not outweigh the choice of conventional high explosives.

Overkill may solve some of the problems created by other variables in the probability of use equation. Where chemical properties require certain dosages in uniform density, commanders could simply double or triple the rounds launched. Commanders could solve some weather and terrain problems by excessive deployment. An effective barrier to inhalation and skin absorption, however, is relatively impervious to such overkill.

The critical bottom line to chemical warfare seems to be the absolute requirement of an unprepared target taken by surprise. As a result, chemical weapons are most likely to be used against civilian populations.²¹⁷

D. Testing the Equation: Known Chemical Weapons Use

Chemical weapons have become exponentially more lethal since World War I, although the fundamental variables of the probability of use equation emerged during that period. Since the Geneva Protocol, use of chemical agents has been sporadic and unevenly documented. Yet, even with incomplete reporting and many unanswered questions, these incidents bear out the significance and interaction of the variables in the chemical weapons use probability equation.

The Japanese reportedly used chemical agents in China in 1939 against civilian targets. "Data on the Japanese use are sparse Chemical weapons were used in coordination with gunfire and close combat to create surprise and confusion within the Chinese ranks."²¹⁸

214. *Contracts*, STATE NEWS SERVICE, Oct. 9, 1990.

215. Mathew Meselson, *The Role of Chemical Defense in Chemical Warfare, Chemical Deterrence and Chemical Disarmament*, 11 CHEMICAL WEAPONS CONVENTION BULL., Mar. 1991, at 19.

216. *Id.*

217. BROWN, *supra* note 211, at 37.

218. Edward Corcoran, *Assessing Chemical Weapons' Military Utility in NEW TECHNOLO-*

The Japanese also used chemical agents to "dislodge personnel from caves and villages and seal off battle areas."²¹⁹

Between 1963 and 1967, the Egyptians employed chemical agents repeatedly in North Yemen. The information about the Yemeni operation, however, is sketchy at best. "Initial reports involved mustard gas and some similar agent on several villages."²²⁰ Egypt denied the allegations that casualties were high when the royalist headquarters at Kitaf were attacked with nerve gas.²²¹

Prior to 1971, when the United States suspended its herbicide program in Vietnam, reports of United States deployment of chemical weapons against civilian populations appeared frequently enough in the foreign press to prompt embarrassed denials from United States officials. Samples of Agent Orange from supplies at Tan Son Nhut airbase in 1969 were found to be highly teratogenic—capable of producing fetal abnormalities.²²² The herbicide caused a severe skin irritation called chloracne. As early as 1959, reports of neurological damage from the active ingredients of Agent Orange appeared in medical literature.²²³ In October of 1970, allegations of United States use of toxic substances against the Vietnamese were presented to the Stockholm Conference.²²⁴ Not until 1991 did the United States unequivocally recognize the toxicity of Agent Orange. Congress finally passed legislation to remove restrictions on Veterans Administration benefits for United States service personnel exposed to the chemical while serving in Vietnam.²²⁵

Since 1980, there have been reports that Ethiopia launched chemical attacks against the Eritrean Peoples Liberation Front. Ironically, the Ethiopians themselves were targets of one of the few chemical weapons attacks after World War I. In 1937, invading Italian

GIES FOR SECURITY & ARMS CONTROL 287, 296-97 (Eric H. Arnett ed., 1989). See generally BURCK & FLOWERREE, *supra* note 30.

219. *Id.* at 297 (citing R. HARRIS & J. PAXMAN, A HIGHER FORM OF KILLING 3 (1982)).

220. *Id.* at 298.

221. *Id.*

222. NEILANDS ET AL., *supra* note 115, at 173.

223. *Id.* at 104-05. Foreign newspapers reported on September 15, 1965, that 78 civilians were killed when a toxic grenade exploded in a shelter at Ba Long An in Quang Ngai province. On February 1, 1968, 141 civilians, including 74 children, were reported killed by toxic gas at Ky Anh in Quang Nam province. *Id.* at 37.

224. *Id.* at 38.

225. Service personnel exposed to Agent Orange filed a class action suit against the manufacturers of the chemical; the suit was settled by a consent decree. See *In re Agent Orange Prod. Liab. Litig.*, 597 F. Supp. 740, *aff'd* 818 F.2d 145 (1st Cir. 1984). For a background discussion, see PETER SHUCK, AGENT ORANGE ON TRIAL (1986).

forces used mustard against Ethiopian defenders.²²⁶ The Italian operation has been described as follows:

[C]hemical weapons were used in support of advancing ground forces, but they were delivered almost exclusively by aircraft, initially by dropping drums of mustard gas, and later, by using aircraft spray tanks. Much of this effort went into terrain contamination and was particularly effective against shoeless tribesmen These chemical attacks had a deep psychological effect on the Abyssinians, many of whom simply deserted.²²⁷

Reports emerged in the early 1980s that the Soviet army was using chemical agents against insurgents in Afghanistan. Reports also implicated Soviet use of chemical weapons in Georgia. A Report to the President from the United States Department of State in 1982 described aerial bomb and rocket delivery of a lethal agent and an incapacitating agent against Afghan insurgents.²²⁸

All of the reported incidents share the common variable of an unprepared civilian target. Even where the Iraqis used chemical agents in the Iran-Iraq war, reports suggest that the Iranians were using "human wave" tactics with untrained teenagers. Most observers agree the net effect of Iraqi chemical weapons use was only to prevent themselves from being overrun by the Iranians. Chemical agents apparently provided the Iraqi military no offensive advantage.

E. Tactical Applications

In addition to use against unprepared troops or civilian populations, three other applications of chemical weapons exist which might make sense given the low probability estimate generated by the interactive equation of variables. First, chemical weapons function as deterrents. The simple possession of chemical agents accompanied by a credible delivery system is enough to provide deterrence. Some observers suggest that the ability to retaliate in kind substantially reduces the probability of chemical attack.²²⁹ The standoff between equally equipped Axis and Allied troops during World War II is a prime example. Iran's initial inability to retaliate against Iraq demonstrates the opposite. The war for Kuwait illustrated that a credible

226. McGeorge, *supra* note 161, at 16.

227. Corcoran, *supra* note 218, at 297.

228. United States Department of State, *Chemical Warfare in Southeast Asia and Afghanistan*, Report to the President, March 22, 1982 (updated in November 1982) *cited in* Corcoran, *supra* note 218, at 299.

229. McGeorge, *supra* note 161, at 16.

threat of retaliation *in kind* may not be necessary because a threat of retaliation *in effect* carries the same impact. In a letter addressed to Iraqi President Saddam Hussein, President Bush laid down the gauntlet:

Should war come, it will be far greater tragedy for you and your country. Let me state, too, that the United States will not tolerate the use of chemical or biological weapons The American people would demand the strongest possible response. You and your country will pay a terrible price if you order unconscionable actions of this sort.²³⁰

Second, commanders cannot expect to accomplish a military objective greater than harassment with chemical weapons use. At best, a commander can hope that the threat of chemical weapons will force an opposing army to take protective measures limiting its own mobility. Commentators suggest that had Iraq deployed chemical weapons against Allied troops in the Saudi desert, commanders would have withdrawn troops to protected positions, forcing them to resort to aerial bombing to accomplish their objective of retaliation.²³¹

The third application is one of last resort. Apparently, Iraq's chemical weapons use during the Iran-Iraq war emanated from a sense of desperation. However, in other wartime situations where use of a weapon of last resort might be expected, such as the last desperate hours of the Third Reich, chemical weapons, though available, were never used. The last resort application is probably highly dependent on the level of retaliation the enemy can muster. As a result, the military attitude toward chemical warfare in World Wars I and II has been characterized as follows:

Influenced by the counter-propaganda writings of articulate military proponents of chemical warfare, most civilians assumed the military accepted and was eager to employ chemical weapons. This assumption was false. Aside from those military leaders institutionally committed to toxic agents, the military establishment as a whole was opposed to their use. As an area weapon developed by scientists to strike insidiously and from afar, gas did not accord with the honor of the profession. In addition, the immense logistical and training burden unique to gas warfare required greater battlefield effect than could be attained with other weapons in order to

230. 11 CHEMICAL WEAPONS CONVENTION BULL., Mar. 1991, at 11 (quoting the INT'L HERALD TRIBUNE, Jan. 4, 1991, available in LEXIS, Nexis Library, IHT File).

231. See Livingstone & Douglass, *supra* note 5, at 57.

justify resorting to such a high cost weapon.²³²

Are these attitudes universally held by military commanders of the nations known to possess chemical weapons? The United States, the Soviet Union, France, Iraq, and Iran have publicly acknowledged their possession of chemical weapons. Though the attitudes of the Iraqi military were obscured by the public insistence of Saddam Hussein that chemical weapons represent a legitimate military option, the conduct of Iraqi commanders during the war for Kuwait suggests that they do not share that view. Bulgaria, China, Egypt, Ethiopia, Israel, Libya, Syria, Taiwan, and Vietnam possess chemical capability, though without public acknowledgement. Cuba, Hungary, Laos, North Korea, Poland, and Romania probably possess chemical weapons as probably do the states formerly comprising Czechoslovakia and Yugoslavia. Meanwhile, the suspicion of chemical weapons capability falls on Argentina, Brazil, Chile, India, Indonesia, Jordan, Pakistan, Peru, Saudi Arabia, South Africa, South Korea, and Thailand.²³³ The answer to the question of military attitude in those nations can only be surmised.

Clearly, the main incentive for governments to develop a chemical weapons arsenal is to gain a psychological advantage over their enemies. Yet that psychological advantage quickly dissipates when rival governments develop either equal capability or effective defensive measures. The tactical advantages of chemical weapons use in military conflicts then become illusory. "Despite the many reports of Iraqi deployment of chemical munitions in the Kuwait theater of operations, [by] mid-March [1991], it appears that none have been found."²³⁴ In fact, after the cease fire, "United States military officers have virtually concluded that the most controversial weapon in Iraq's arsenal—chemical weapons—never entered the combat theater."²³⁵ Moreover, this assessment of the chemical option was offered at the American Association for the Advancement of Science in September, 1990:

The idea that chemical weapons are the poor man's deterrent is wrong; they are not. If the poor man wants to deter someone with nuclear weapons, that someone is, by comparison at least, a rich man. Rich men can also afford gas masks. Chemical weapons . . .

232. BROWN, *supra* note 211, at 293-94.

233. McGeorge, *supra* note 161, at 16.

234. *News Chronology*, CHEMICAL WEAPONS CONVENTION BULL., Mar. 1991, at 16.

235. *Id.*

are the killer of the poor man. This is coming to be understood even in the Middle East.²³⁶

The menace of chemical weapons, nevertheless, still possesses the power to mobilize world opinion, a fact which may render a chemical capability more of a liability to a renegade government than an asset. This liability potential arose in the unanimous coalition formed with unprecedented rapidity in the United Nations when Iraq refused to withdraw from Kuwait in November 1990. Meanwhile, the specter of Libya's confounding the probability prediction of chemical weapons use has caused concern. This provided a backdrop for the scenarios that world leaders used to gain popular support for military force against Iraq. Saddam Hussein helped the staging by declaring in a Baghdad Radio address in April 1990:

We have the binary chemical [al-kimawi al-muzdawij]. Let them take note of this. We have the binary chemical. According to our information only the United States and the Soviet Union have it It exists in Iraq.²³⁷

Apart from the sequence of events leading to the United Nations effort to employ military force to liberate Kuwait, the psychological advantage afforded by chemical weapons applies only in the short term. Even before the war ended, some observers raised questions about the absence of the one form of destructive power which the world press painted as inevitable.

F. Theoretical Application: Terrorism

The importance of preparedness of the target suggests one application of chemical weapons not easily dismissed, terrorism. Six reasons exist to explain why terrorists may find chemical weapons attractive:

(1) Chemical weapons are relatively inexpensive. One source estimates \$600 worth of chemical weapons possesses the killing power of \$2000 worth of conventional weapons.²³⁸

(2) Chemical weapons are easily produced in a short time. Scientific texts provide the recipes. Terrorists merely need an expert to

236. Matthew Meselson, *Implications of the Kuwaiti Crisis for Chemical Weapons Proliferation and Arms Control*, in CHEMICAL WEAPONS AND SECURITY IN THE MIDDLE EAST: PROCEEDINGS FROM A AAAS CONGRESSIONAL BRIEFING 16 (Eric H. Arnett ed., 1990).

237. *News Chronology*, CHEMICAL WEAPONS CONVENTION BULL., June 1990, at 13.

238. JOSEPH D. DOUGLASS, JR. & NEIL C. LIVINGSTONE, *AMERICA THE VULNERABLE* 16 (1987).

practice the "alchemist's art."²³⁹

(3) Any chemical weapon creates a credible threat. A few milligrams of VX can kill one human being. Where population is dense, a small amount—a few hundred pounds—can cause thousands of casualties.²⁴⁰

(4) Any target is vulnerable. Because terrorists depend on surprise and choose unsuspecting targets, chemical weapons possess great appeal.²⁴¹

(5) Chemical weapons create less hazard to terrorists themselves than does a nuclear device. Moreover, because effects may be delayed, chemical weapons allow a better chance for terrorists to escape after delivering the payload.²⁴²

(6) Chemical weapons prove more reliable than a nuclear device because the need to test before deployment is not as great and can generally be solved by overkill.²⁴³

Although biological agents probably hold a superior attraction to terrorists than chemical weapons, a credible example of chemical weapons terrorism occurred in the mercury poisoning of exported Israeli citrus fruit in 1978. "[C]hemical agents [are] . . . superior to either biological[s] . . . or toxins because of their stability, ease of manufacture and dispersal, and controllability (inasmuch as they are not contagious)."²⁴⁴

Even if the metaphorical regression equation yields a low probability of chemical weapons use, when a nation's own troops may face such a threat, calls for strict proliferation control assume urgency. The difficulty lies in balancing among the many competing interests which must bear the residual effects of the attempt to control chemical weapons proliferation to renegade governments.

III. SANCTIONS SPOTLIGHT TENSION IN UNITED STATES EXPORT POLICY

Sanctions "bring home the official position of the country with respect to the production and use of chemical weapons," then Director of the United States Central Intelligence Agency, William Web-

239. *Id.* at 17.

240. *Id.*

241. *Id.* at 17-18.

242. *Id.* at 18.

243. *Id.*

244. *Id.* at 13.

ster, told Congress in 1989.²⁴⁵ “[Sanctions provide] an opportunity for sustained moral suasion, putting the spotlight on these activities.”²⁴⁶

The United States may apply sanctions to the proliferation of chemical weapons under the Export Administration Act (“EAA”).²⁴⁷ The EAA is far reaching. Its provisions cover not only United States manufacturers and exporters, but offshore subsidiaries of United States companies as well. Foreign purchasers and manufacturers using United States components or technology, as well as foreign firms affiliated with United States firms, are included.²⁴⁸ United States export policy, however, functions in an arena where interests favoring more rigid unilateral control often oppose interests favoring more flexible multilateral control.

A. Competing Goals of the EAA

In 1989, the Eastern Bloc—closed for a generation to most western commerce—trembled. When no Soviet tanks appeared to prevent it, the Eastern Bloc dissolved almost without violence. Within weeks, Germany was reunited and the Warsaw Pact²⁴⁹ nations had thrown open their doors, cordially inviting western businesses to help them join the mainstream of the free world’s capitalist economy.²⁵⁰ In the United States, businesses eager to participate turned to Congress. Referring to sweeping export legislation, Donald W. Reigle, chairman of the Senate Banking Committee, said, “The [bill] will enable us to lend help to the emerging democracies in Eastern Europe that need Western technologies to modernize their economies.”²⁵¹ United States in-

245. S. REP. NO. 166, 101st Cong., 1st Sess. 5 (1989).

246. *Id.* at 5-6.

247. 50 U.S.C. app. §§ 2401-24 (1990).

248. Edward J. Krauland et al., *Recent Developments in U.S. Export Licensing and Civil Enforcement Procedures*, 7 INT’L TAX & BUS. LAW. 204, 204 (1989).

249. The military alliance called the Warsaw Pact was officially dissolved as of July 1, 1991. Michal Donath, *East Europe Dissolves Warsaw Pact, Discusses Yugoslavia*, UNITED PRESS INT’L, July 1, 1991, available in LEXIS, Nexis Library, UPI File.

250. Presently, the United States Secretary of Defense must review and determine whether the export of goods, technology, or industrial techniques will significantly increase potential military capability of a controlled country before such export may be authorized. 50 U.S.C. app. § 2403-1(b) (1974). Controlled countries include “the Soviet Union, Poland, Romania, Hungary, Bulgaria, Czechoslovakia, the *German Democratic Republic (East Germany)*, and such countries as may be designated by the Secretary of Defense.” *Id.* § 2403-1(d) (emphasis added).

251. *House, Senate Approve Conference Report on Bill to Extend System of Export Controls*, 7 Int’l Trade Rep. (BNA) No. 43, at 1636 (Oct. 31, 1990).

dustry and its advocates realized that the old Cold War restrictions on trade to Eastern Europe had to be discarded quickly.

The principal purpose of the EAA lies in encouraging commerce. Congress has found that, "[e]xports contribute significantly to the world economic well-being of the United States and the stability of the world economy . . ." ²⁵² Placing a "high priority" on exports is in the "national interest." ²⁵³ The second purpose of the EAA, however, is the control of those exports which may affect national security. "Exports of goods or technology without regard to whether they make a significant contribution to the military potential of . . . countries may adversely affect national security . . ." ²⁵⁴

The interplay of these two purposes—encouragement and restriction—creates tension. These inherently competing interests emerge from the application of EAA at many levels. Even at the highest level, the dichotomy of purpose appears. For instance, the regulation of exports is constitutionally the domain of Congress. Historically, where greater accountability might engender flexibility, Congress has delegated that authority to the President, fundamentally yielding legislative flexibility in favor of the President's discretion. Ironically, in the matter of chemical weapons proliferation control, it would be Congress arguing for greater rigidity as the President maneuvered for greater flexibility.

Moreover, the President divides the actual oversight of exports on the same theme. The United States Commerce Department administers the EAA ²⁵⁵ in the best interests of industry, placing a high premium on flexibility. However, because the President also may use exports to advance foreign policy, ²⁵⁶ both the United States Department of State and the United States Department of Defense play important roles in the application of the EAA. Since a main tool of the foreign policy function often involves withholding or withdrawing export privileges, the roles of the Departments of State and Defense ²⁵⁷ place a high premium on rigidity.

252. 50 U.S.C. app. § 2401(2).

253. *Id.* § 2401(3).

254. *Id.* § 2401(5).

255. *See id.* § 2403.

256. *See id.* § 2402(1).

257. The United States Department of State exercises its power over exports under 22 U.S.C. § 2778 (1989) with advice from the United States Department of Defense. *See* 51 Fed. Reg. 17,509 (1986). The United States Customs Service, under the United States Treasury Department, provides enforcement for various agencies. *See* 22 C.F.R. § 127.4 (1992).

Congress' attitude toward Germany illustrates the tension engendered by the duality of purpose. On the one hand, flexibility of export control may help Germany through the budgetary trauma of reunification. On the other hand, Germany represents the target of the latest congressional demand for mandatory sanctions against suppliers of chemical weapons technology and their subsidiaries. This results because Germany leads the list for the number of private firms involved in weapons traffic with the Middle East.

B. Flexibility and Multilateral Action: Commerce and Industry

The EAA controls exports for three purposes: national security, foreign policy, and short supply.²⁵⁸ Goods and technologies which may make significant contributions to the military capability of any country potentially detrimental to the national security of the United States form the broad domain of items regulated under national security. Under foreign policy, EAA includes the control of goods and technology which may significantly further the foreign policy of the United States or its declared international obligations.²⁵⁹ The sweep of EAA expands further with the third purpose to protect the domestic economy from losing scarce materials.²⁶⁰

1. Licensing Scheme

Through the Export Administration Regulations,²⁶¹ the United States Commerce Department grants licenses to exporters of commodities and technologies included under the EAA. These objectives assume that all goods and technologies may be freely traded. Upon that foundation of total flexibility comes the caveat that some items require special permission. Still within the tradition of flexibility, however, is the assumption that the permission will be granted in the form of a license. The Commodity Control List²⁶² enumerates those items which require licenses, either general or validated. In theory, the scheme furthers the goal of encouraging United States exports while imposing a limited set of restrictions. In reality, the restrictions are extensive, broadly defined, and frequently changing.²⁶³ Moreover,

258. 50 U.S.C. app. § 2402(2).

259. *Id.*

260. *Id.*

261. 15 C.F.R. § 768 (1992).

262. 15 C.F.R. § 799.1 (1992).

263. In 1990, 10 new chemicals were added to the Commodity Control List for a total of

the licensing scheme is a complex hierarchy determining what commodity may go to which country at what time.

The existence of a separate list, regulations, and sanctions under the Arms Control Export Act ("ACEA")²⁶⁴ administered by the United States Department of State further complicates the situation. An exporter must consult the current Commodity Control List to determine if the desired export falls under the category of a "general license" for which specific authorization is unnecessary. If the export does not fit the general license category, the "exporter must apply for and obtain a specific 'validated license.'" ²⁶⁵

Classifying the export as a controlled commodity is not the end, however. An exporter must confirm the ultimate destination of the export.²⁶⁶ Some chemicals, for example, may be restricted to every country except a chosen few; these include nine chemicals on the Australia Group's core list. On the other hand, some chemicals may be restricted only to specific countries, such as Iran, Iraq, Syria, or Libya.²⁶⁷ In the case of precursor chemicals, for instance, an export license for thiodiglycol would be required if the destination were Iraq but not if the destination were New Zealand.

Additional restrictions control the re-export of goods. If authorities at the intervening destination regulate exports in cooperation with the United States, then no license may be required for re-export unless the item is a supercomputer.²⁶⁸ The exporter must also check the United States Munitions List to be certain that the good or technology does not fit within a catch-all category.

2. Penalties

The Commodity Control List contains more than 200 pages.²⁶⁹ International negotiations and intelligence reports affect the list, with restricted nations and commodities constantly changing. Some commentators suggest that the Commodity Control List represents a trap for unwary exporters.²⁷⁰ In probable recognition of the opportunities

51. See 54 Fed. Reg. 52,017 (1989). In 1991, two new chemicals were added. See 56 Fed. Reg. 2676 (1991). In 1992, four new chemicals were added. See 57 Fed. Reg. 60,122 (1992).

264. 22 U.S.C. § 2778 (1990).

265. See Krauland et al., *supra* note 248, at 207.

266. 50 U.S.C. app. § 2404(b)(1) (1990).

267. See 54 Fed. Reg. 52017 (1991).

268. 50 U.S.C. app. § 2404(4)(A).

269. 15 C.F.R. § 799.1 (Supp. I 1990).

270. See Krauland et al., *supra* note 248, at 207.

for innocent violation, civil penalties²⁷¹ are markedly more lenient than the criminal penalties for “knowing” or “wilful violations.”²⁷² Criminal penalties have the greatest impact on United States companies, providing for fines as much as five times the export’s value and five years in prison. Under the civil section, the maximum fine per violation is \$100,000.²⁷³

The most severe penalty, however, is the denial of all export privileges to a violator for up to ten years.²⁷⁴ The 1988 reauthorization of the EAA allows the denial of export privileges to persons “related” to the convicted violator.²⁷⁵ Because separate amendments dealt with conspiracy, exporters became concerned about the ways a person might be related to a violator, thus becoming subject to the dreaded sanction of being denied all licenses. The accompanying rules issued the following year addressed the question, though unsatisfactorily. The rules outlined the circumstances that the Director of Export Licensing may consider before barring the export privileges of a “related” person. The rules then offered the assurance that notice would be given and a hearing provided to challenge the existence of the relationship.²⁷⁶

However, new language may bring “unintended third parties within the EAA’s coverage and forbid them to export on some attenuated affiliation.”²⁷⁷ Finding the appeal procedure inadequate for a denial of privileges on the basis of relation to a violator, one observer remarked that, “the government appears to be giving itself greater latitude in EAA enforcement.”²⁷⁸ Despite this concern, the Senate may have eliminated sanctions applying to a violator’s entire corporate family in the Chemical and Biological Weapons Control and Warfare Elimination Act of 1991 (“Weapons Control Act”)²⁷⁹ which

271. See 50 U.S.C. app. § 2410(c) (1990).

272. See *id.* § 2410(a), (b) (1990).

273. 50 U.S.C. app. § 2410 (1992).

274. 15 C.F.R. § 770.15 (d).

275. 50 U.S.C. app. § 2410(b).

276. 15 C.F.R. § 770.15(h) (1992).

277. Krauland et al., *supra* note 248, at 223.

278. *Id.*

279. Chemical & Biological Weapons Control and Warfare Elimination Act of 1991, Pub. L. No. 102-138, 105 Stat. 1245-59 (1991). The Weapons Control Act was first introduced as S.195 during the 101st Congress, 1st Session, but was reintroduced as S.320 in 1991 and emerged on September 25, 1991, in the House of Representatives as H.R. 3409, sponsored by Representative Dante B. Fascell, Democrat from Florida. H.R. 3409 was reported to the House on October 3, 1991 and again on November 19, 1991. See H.R. REP. NO. 235, 102d Cong., 1st Sess., *reprinted in* 1991 U.S.C.C.A.N. 835.

was incorporated into the Omnibus Export Amendments of 1990.

The Office of Export Enforcement may exercise much discretion before it refers a violation to the Justice Department. If an exporter voluntarily admits a violation, authorities consider extenuating circumstances and actual impact on "regulatory objectives" as well as whether the violation represents "an aberration" in an otherwise compliant history.²⁸⁰ In such cases, authorities may issue a warning letter. Even when a violation has reached the charging letter stage, authorities encourage violators to settle.²⁸¹

3. Contract Sanctity

The policy of contract sanctity allows agreements negotiated under one set of government regulations to be implemented despite a later change in regulations. Contract sanctity clauses provide another measure of leeway. As regulations change regarding which products will be denied licenses and which destinations have become proscribed, the United States Commerce Department maintains the right to allow for the licensing of shipments contracted before the change. For example, thionyl chloride, one of the principal precursors for mustard gas, was placed on the proscribed list of chemicals in 1989 so as to bring the list in line with the one published by the Australia Group earlier that year.²⁸² But the regulation still allowed approval of applications for thionyl chloride shipments to Iraq if the contract was formed before July 6, 1987.²⁸³ Thionyl chloride shipments to newly restricted destinations other than Iran, Iraq, Libya, or Syria²⁸⁴ would be approved if the agreements were entered into before December 12, 1989.²⁸⁵

C. *Rigidity and Unilateral Action: State and Defense*

Under the auspices of the Bureau of Politico-Military Affairs in the Department of State, the Office of Munitions Control oversees ex-

280. Krauland et al., *supra* note 248, at 225 (citing Bureau of Export Administration, Voluntary Disclosure, 54 Fed. Reg. 9233, 9235 (1989)).

281. Krauland et al., *supra* note 248, at 226.

282. 15 C.F.R. § 776.19(d) (1992).

283. *Id.*

284. The prohibition does not apply to NATO members, Australia, Austria, Ireland, Japan, New Zealand, and Switzerland. *Id.* § 766.19(h).

285. The rules also contain savings clauses. For example, the final rule announced January 24, 1991, approved any shipment loaded or on the dock for loading pursuant to actual orders for export before February 7, 1991, provided it was exported by February 22, 1991. See 56 Fed. Reg. 2676 (1991).

port licenses for arms shipments. Though somewhat shorter than the Commodity Control List, the United States Munitions List presents a complex maze of categories for license applicants. Wide categories of component parts are described.²⁸⁶

In addition, while the sanctions for violating the EAA are lenient and flexible, the penalties for violating the AECA²⁸⁷ are severe and rigid. The criminal penalty may be as high as \$1 million in fines plus a maximum of ten years in prison. The maximum civil penalty is \$500,000.²⁸⁸ The State Department possesses wide power to revoke, deny or suspend export privileges:

- (1) [W]henever the Department believes that the AECA . . . or a United States government export authorization has been violated;
- (2) [W]henever a party to a manufacturing license or technical assistance agreement has been debarred;
- (3) [W]henever an order of debarment or suspension has been made applicable to an applicant, licensee or party to an approved or proposed agreement;
- (4) [W]henever a person who has been debarred or suspended has a significant interest in the transaction;
- (5) [W]henever the applicant or, in certain cases, any party to the export or agreement has been indicted or convicted of specified criminal offenses or is ineligible to contract with or receive an export or import license from an agency of the United States government; or
- (6) [W]henever an applicant fails to provide information expressly required by the . . . license forms.²⁸⁹

Previous legislation allowed some discretionary authority to grant new licenses to exporters convicted of violating the AECA. However, since 1989, a minimum period of three years must pass before any new license can be issued.²⁹⁰ The total number of persons barred for violating the AECA stood at twenty-six in 1988. The regulations and procedures surrounding this ultimate penalty have become more comprehensive as to who may be debarred for direct or indirect violation and more rigid as to the avenues of appeal.²⁹¹

286. *See, e.g.*, 22 C.F.R. § 121.1 (1992).

287. 22 U.S.C. § 2778(c) (1990).

288. 22 U.S.C. § 2778(e) (1990).

289. Krauland et al., *supra* note 248, at 209 (citing 22 C.F.R. §§ 126.7, 127.6 (1980)).

290. 22 C.F.R. § 127.6(c) (1992).

291. *See* Krauland et al., *supra* note 248, at 214-15.

D. *New Rules Bring Tension to Surface*

When the Department of State unveiled a plan in September 1990 "to require United States companies to obtain export licenses for all items, from computers to paper clips, that they believe will be used to develop missiles and chemical or biological weapons,"²⁹² the tension between the opposing goals of the President's export enforcement policy arose anew. The new plan expanded the category of items warranting denial as "unacceptable risks" for use in missile, chemical, or biological warfare projects.

The new plan also shifted the burden to the exporter to show whether the end use of the export was known to be a weapons program. The call for greater rigidity reflects the frustration created in export control when suppliers of materials and technology insist, usually in good faith, that they did not know their exports were ultimately destined for weapons programs. Making the lists of proscribed items more specific and placing the burden of scienter on the party best able to prove it are examples of two ways in which the government sought to relieve the frustration.

The unilateral quality of the new "enhanced" controls disturbed representatives of the affected industries and officials in the Commerce Department. Some experts estimated that the unilateral closing of these gaps in export controls would cost United States industry \$250 billion a year in exports. Industry contended that such controls must be multilateral so that United States exporters do not bear a disproportionate share of the burden imposed by anti-proliferation measures.²⁹³

E. *Dual Use Item Caught In the Middle*

The Commerce Department and industry representatives advocate flexibility and multilateral action in export control. Meanwhile, the Departments of State and Defense champion rigidity and unilateral action. In the middle is the dual use export item, a commodity such as Phosgene, extensively used for peacetime products such as urethanes.²⁹⁴ Yet, Phosgene's long history as a chemical weapon,²⁹⁵

292. *Industry Attacks U.S. Plan to Impose Unilateral Curbs on Proliferation Exports*, 7 Int'l Trade Rptr. (BNA) No. 44, at 1697 (Nov. 7, 1990).

293. *Id.*

294. See Ellen Goldbaum, *For Illicit Chemical Arms, No Easy Remedies Seen*, CHEMICAL WK., Jan. 18, 1989, at 12.

295. Phosgene was the second chemical used in World War I and continued to be the preferred choking agent for the duration of that war. See Haber, *supra* note 106, at 41-42.

illustrates its usefulness in a chemical weapons program. Additionally, many legitimate users stockpile the chemical and resell it. Further, international arms brokers ingeniously disguise the ultimate destination and purchaser. Given this set of circumstances, to apply effective unilateral controls on Phosgene requires close scrutiny of every shipment not only from the United States but also from subsidiary suppliers outside the United States. Such scrutiny inevitably adds cost and reduces competitiveness.

1. Assigning the Right List

As weapons technology advances, the overlapping jurisdiction of the Departments of Commerce and State creates difficulties with identifying what products advance proliferation.²⁹⁶ The dilemma posed by the dual use item arises from the use of two lists, the Commodity Control List and the United States Munitions List, and consequently, two sets of sanctions. If dual use items remain on the Commodity Control List under the jurisdiction of the Commerce Department, industry can expect some flexibility. However, if the item moves over to the Munitions List, industry must brace itself for rigid application of penalties.

The "enhanced" program announced by the State Department suggests that dual jurisdiction may be the solution. The precedent for dual jurisdiction appears with inertial navigation systems that are standard equipment in civil aircraft. The systems appear on the United States Munitions List if the destination is a controlled country under the Foreign Assistance Act of 1961.²⁹⁷ Otherwise, the same equipment comes under the jurisdiction of the EAA.²⁹⁸

2. Interagency Disagreement

On at least one occasion the Departments of State and Defense experienced difficulty agreeing on an item bound for Iraq. "[T]his stuff was classified a munition," testified Dr. Stephan Bryen, former Under Secretary of Defense, to Congress, "because it was in a military-type container."²⁹⁹ The 1987 application involved an export license to send atropine injectors to Iraq. An atropine injector delivers

296. See *supra* part II.B.6.

297. 22 U.S.C. § 2370(f) (1990).

298. 50 U.S.C. app. § 2416(c) (1990).

299. *Foreign Relations Hearings, supra* note 19, at 203.

a self-administered dose of nerve gas antidote under combat conditions.

The State Department at the time thought it was all right, basically saying, "Well, it seemed to them it was a defensive, almost humanitarian kind of export." . . . The Army thought it was all right until they did a little hard thinking about it. The policy people in what we called international security affairs, the people who had responsibility for that region, thought it was all right. My own technical people [at the Defense Department] thought it was all right, too. I didn't think it was all right. I thought it was a dumb thing to do and dangerous thing to do, mostly because the only people that had nerve gas . . . were the Iraqis and the only conceivable reason that they would want these products was to allow them to operate with impunity close up against the Iranians or the Kurds or whoever they were using it against as some means of protecting themselves from its effects.³⁰⁰

In testimony carefully orchestrated by Senator Jesse Helms to allow the telling of the atropine injector story, Dr. Bryen insisted his was not a scientific call but a layman's application of common sense. "So, I objected to it. I got myself into quite a little quarrel with the State Department and people in my own department [I]t shows you that the rules and regulations that we have are pretty weak and unclear."³⁰¹

The Commerce Department evidently was not involved in the atropine injector license denial. Given the categories of the Munitions List, however, the Department of State must have stretched some category to include the injectors. The Commerce Department could have claimed jurisdiction under the Commodity Control List had it wanted to enter the argument. This sort of dispute might have been prevented had an earlier proposal passed that provided for "a dispute resolution procedure between the Departments of Commerce and State over whether commodities should be controlled as defense articles under the munitions list of the [AECA] or dual use commercial goods on the Commodity Control List under EAA."³⁰²

3. Enhanced Proliferation Control Initiative

The decision to stop shipment of the Iraq-bound atropine injectors was correct. However, the decision-making process illustrates

300. *Id.*

301. *Id.*

302. *See* 136 CONG. REC. S17,182 (daily ed. Oct. 26, 1990) (statement of Sen. Sarbanes).

why industry worried openly over the “Enhanced Proliferation Control Initiative” announced in early 1991, especially with regard to the technology classified as contributing to chemical weapons production. Although the chemical industry convinced the Commerce Department during the comment period to omit process control instruments or computer systems specially designed for highly automated systems from the new list, high nickel content alloy equipment survived to the final rule stage. Industry complained that “high nickel content alloy equipment . . . is ‘ubiquitous’ ” and that the United States is not the only supplier.³⁰³ While many of the provisions in the Department of State’s new initiative fill gaps in United States export control, the sweeping additions of equipment and technology with wide commercial use defy logic.³⁰⁴

303. *Industry Comments Partially Considered in New List of Banned Chemical Equipment*, 8 Int’l Trade Rptr. (BNA) No. 7, at 235 (Feb. 13, 1991).

304. *Id.* at 235-36. The revised list of export-controlled equipment and technology in the “Enhanced Proliferation Control Initiative” includes the following:

1. Chemical process equipment constructed of Hastelloy, Monel, or another alloy with a nickel content in excess of [forty] percent by weight, as follows: reactor vessels, storage tanks and containers, heat exchangers, distillation columns, or condensers.
2. Thermometers or other sensors encased in alloy with a nickel content in excess of [forty] percent.
3. Chemical process equipment as in item 1 which is lined with nickel, polyvinylidene fluoride, high density polyethylene, or glass.
4. Pumps or valves
 - (a) incorporating a body made from alloy with a nickel content in excess of [forty] percent by weight, or
 - (b) lined with nickel, or
 - (c) otherwise designed to be utilized with fluorine or hydrogen fluoride, or with organophosphorus compounds.
5. Filling equipment enclosed in a glove box of similar environmental barrier, or incorporating a nickel-lined or Hastelloy nozzle.
6. Incinerators specially designed to incinerate
 - (a) any chemical weapons agent or listed precursor; or
 - (b) organophosphorus compounds.
7. Toxic gas monitoring systems designed to detect phosphorus, sulphur, or fluorine compounds, or designed to detect any [chemical weapons] agent, which are:
 - (a) designed for continuous operation, and
 - (b) capable of detecting such chemicals at a concentration less than 0.1 milligrams per cubic meter of air.
8. Monitoring systems for detection of chemical compounds having anticholinesterase activity.
9. Engineering services as follows:
 - (a) overall plant design;
 - (b) design, specification, or procurement of equipment;
 - (c) supervision of construction, installation, or operation of complete plant or components thereof;
 - (d) training of personnel; or

F. Congress' Position

Since the EAA comes up for renewal every two years,³⁰⁵ Congress may amend the export policy administered by the President through the Departments of Commerce, State, and Defense. Invariably these efforts reflect congressional impatience with the stalemate created by competing goals of flexibility and rigidity.

1. The Toshiba-Kongsberg Affair

Resentment of Japanese insensitivity to United States export policy³⁰⁶ was at the heart of an unprecedented amendment in 1988 that may represent a constitutionally prohibited *ex post facto* law.³⁰⁷ The amendment not only extended the force of United States export sanctions retroactively, but in broader scope as well.

When Japanese Toshiba and Norwegian Kongsberg sold computer-controlled machine tools to the Soviet Union, they violated their own laws but not United States laws because the entire transaction took place outside the United States.³⁰⁸ The fact that the United States possessed no jurisdiction angered the Congress. The computer technology contained in the equipment was reverse-engineered by the Soviets. Intelligence sources said the resulting application allowed Soviet submarine propellers to run silently, improving Soviet opportunities to avoid United States detection.³⁰⁹ Congress imposed a three year ban on government procurement contracts with both firms and their parent companies.³¹⁰

(e) consultation on specific problems, for any facility which the provider of such services knows is designed or intended to produce any of the [chemical weapons] agent or of any precursor chemical

10. Software for process control which is specifically configured to control or implement the production of any [chemical weapons] agent or of any precursor chemical

Id.

305. When the EAA lapses because of a delayed vote or a veto, Executive Orders are employed. The Executive Order which followed the veto of the 1990 reauthorization is Exec. Order No. 12,730, 3 C.F.R. 305 (1991).

306. See David Buchan, *The Toshiba Affair: Little Scope for Japan to Make Amends*, FIN. TIMES, July 2, 1987, at 6.

307. See Krauland et al., *supra* note 248, at 235-36. The constitutional issue was dismissed along with the entire cause of action in the Court of International Trade. See *Arjay Assoc. Inc. v. Reagan*, 707 F. Supp. 1346 (1989).

308. See Krauland et. al, *supra* note 248 at 233, 234 n.240.

309. See Buchan, *supra* note 306, at 6.

310. Some exceptions were made to the Toshiba sanctions:

These sanctions do not apply to the procurement of defense articles or services:

(1) under existing contracts or subcontracts,

This action illustrates the congressional policy agenda for export control where Congress disapproved the implementation through normal channels. First, Congress intended to influence the behavior of United States corporations as well as the behavior of foreign corporations. Second, Congress sought to hold the parent company liable for its subsidiary's action, in complete disregard of traditional concepts of limited corporate liability available to multinational enterprises.³¹¹ Third, Congress declined to entrust a critical case to the conventional discretion of the executive branch. Instead, Congress demanded mandatory sanctions, accepting no equivocation about the need for foreign policy flexibility from the executive branch. Fourth, when sufficiently aroused, Congress would apply these rigid controls unilaterally without concern for foreign policy objectives which ordinarily call for multilateral action.

Once Congress demonstrated its policy agenda for especially egregious cases, the four stringent requirements that appeared in the Weapons Control Act should have surprised no one. Forewarned, Bush Administration representatives appeared at hearings to urge Congress to devise sanctions against chemical weapons proliferation, knowing that they would be strict. The fact that three of these rigid requirements survived the House and Senate Conference on the Omnibus Export Amendments Act of 1990 ("Omnibus Act")³¹² suggests Congress' unwillingness to heed the Bush Administration's simultaneous call for multilateral flexibility. This bill died by pocket veto.

2. The 1990 Legislation

The Reagan Administration "viewed [sanctions legislation] as [an] unnecessary infringement on executive branch prerogative."³¹³ The Bush Administration, surprisingly, invited Congress to join in a "coordinated" effort to control chemical weapons proliferation. "In working with the Congress on the proposed legislation," then Assistant Secretary of State H. Allen Holmes said, "we accept in principle

(2) if the President determines that the procurement involves 'essential defense articles or services' and there exists no alternative supplier, or

(3) the President determines that the articles or services are essential to the national security under defense co-production agreements.

Krauland et al., *supra* note 248, at 234.

311. See Philip I. Blumberg & Kurt A. Strasser, *Corporate Groups and Enterprise Liability: Contracts and Torts*, in RESPONSIBILITY OF THE CORPORATE PARENT FOR THE ACTIVITIES OF THE SUBSIDIARY (PLI Series No. 706, 1990).

312. See H.R. 4653, 101st Cong., 1st Sess. (1990).

313. H.R. REP. NO. 334, 101st Cong., 1st Sess., pt. 1, at 4 (1989).

that some form of sanctions . . . would give the administration an additional instrument against countries that use [chemical weapons].”³¹⁴ The Bush Administration immediately stated that it sought no Toshiba-style sanctions. Instead, they desired sanctions allowing executive discretion with no automatic triggering or retroactive application.

The House of Representatives was willing to give President Bush what he wanted, stating, “Sanctions are intended to be mandatory and swift.”³¹⁵ “The legislation does recognize, of course, that it is reasonable to allow the President discretion in imposing sanctions.”³¹⁶ A unilateral initiative to curb chemical weapons proliferation seemed desirable.

While agreeing the initiative must be unilateral, the Senate, on the other hand, refused to comply with the President’s wishes. Its version of chemical weapons sanctions began with a revocation of patent rights. The bill outlined the mandatory imposition of a two-year revocation of export privileges as well as liability for the violator’s corporate family. During hearings, the chemical industry successfully pressed its case against upsetting the delicate infrastructure of proprietary rights which patent suspensions, used as punishment tools, would cause. The patent clause faded before the conference began work on a compromise between the Senate and House versions.

The Senate Foreign Relations Committee, nonetheless, insisted on two remaining differences. The first difference required the President to impose a two year sanction once he had found a violation. The Senate Foreign Relations committee “wanted to ensure that no bureaucracy would be able to succeed in pressing the President to make an erroneous or capricious determination.”³¹⁷ The second difference required the corporate parent and all other subsidiaries to suffer the same sanction as the violating subsidiary.

The bill accorded the President new powers inside and outside the country. Internally, the President could require a validated license for “any good or technology that he deems would assist a country in development, production, stockpiling, or delivery of chemical or biological weapons.”³¹⁸ Externally, sanctions would apply to the

314. *Id.*

315. *Id.* at 5.

316. *Id.*

317. S. REP. NO. 166, 101st Cong., 1st Sess. 6 (1989).

318. *Id.* at 7.

government that used chemical weapons; this section was a revival of the sanctions measure originally drafted against the Iraqis for the Kurdish incident.³¹⁹

Because the United States cannot exclusively rely on assurances of foreign governments, the bill allowed regulation beyond the jurisdictions of the Commerce and State Departments. That power was to be unequivocally unilateral even though the bill paid lip-service to the primacy placed by the Bush Administration on multilateral efforts. “[U]nilateral sanctions cannot substitute for multilateral penalties,” stated the Report accompanying S.195, “[a]ccordingly, [the Senate] is approving sanctions as the first strong step that should lead, with administration support, to multilateral barriers.”³²⁰

3. How Much Discretion Is Enough?

Members of the Senate Foreign Relations Committee pointed to numerous opportunities for presidential discretion in the Chemical Weapons Act. First, for companies engaging in technology and precursor trade, the bill allowed the President to determine if the violation was “knowing.” Second, if the government in whose jurisdiction the offending company resides imposes its own penalties, the President need not invoke sanctions. Third, if a country uses chemical weapons, the legislation allowed the President to choose sanctions “fitting the situation.” Finally, for “both companies and countries, the President could waive sanctions after 1 year in the national security interest or if remedial action has been taken.”³²¹

Senator Garn revealed the underlying motive of the strict re-

319. 136 CONG. REC. S17,179 (daily ed. Oct. 26, 1990) (statement of Sen. Pell). In floor debate, Senator Claiborne Pell outlined the sanctions requirement against a nation which used chemical weapons:

A country sanctioned . . . would automatically face immediate imposition of at least [six] of these . . . sanctions and subsequent imposition of a seventh sanction if the illegal behavior continues:

Termination of U.S. assistance under the Foreign Assistance Act of 1961;

Termination of U.S. Government or commercial arms sales;

Termination of arms sales financing;

U.S. opposition to loans by international financial institutions;

Denial of U.S. Government credit including credit through the U.S. Eximbank;

Prohibition of loans or credit from U.S. banks;

Prohibition of the export of controlled dual-use goods and technology;

Other export restriction;

Downgrading or suspension of diplomatic relations;

Termination of landing rights in the United States.

Id. at 17,180. See also *supra* notes 6-105 and accompanying text.

320. S. REP. NO. 166, 101st Cong., 1st Sess. 6 (1989).

321. 136 CONG. REC. S17,183 (daily ed. Oct. 26, 1990) (statement of Sen. Garn).

quirements in his floor speech. "The only reason that I can see for a broader waiver is so that the State Department can find some diplomatic excuse for the United States to let a company selling chemical weapons to Iraq, or a country like Iraq that gasses its own people, get off scot free."³²²

The Bush Administration favored the House version. The President wanted legislation "based on international cooperation rather than unilateral fiat."³²³ In arguing that the Senate version left the President without "sufficient flexibility to impose or waive sanctions based on a consideration of the nation's security interests," the bill's constitutionality was questioned.³²⁴ Provisions requiring "determinations and . . . follow-on actions by the President in response to requests from relevant committee chairmen"³²⁵ arguably violated the separation of powers doctrine.³²⁶

Senator Jesse Helms characterized the House version as "full of loopholes which will enable companies who wish to continue to trade in chemical and biological weapons technology to avoid all effective sanctions."³²⁷ Declaring that "everyone knows that the State Department will invoke a waiver any chance it gets," Senator Helms explained that the waiver provisions in the House version were unacceptable to the conferees:

To those who insist that the corporate sanctions section of the bill must have waiver authority available for the President to exercise immediately, all I can say [is] that we had our waiver—for the past [two] years. The State Department has waived or opposed every single effort from this Congress to hold Iraq accountable for its actions.³²⁸

Placing responsibility on the corporate family was another reason Senator Helms gave the Senate for reporting a stronger version than what the Administration wished:

Any clever corporate executive could set up five subsidiaries that sell principally to the United States and another, separate subsidiary the sole purpose of which is to sell chemical weapons to Iraq Under the Senate version, not only the parent corporation . . .

322. *Id.*

323. *Id.* at 17,184 (daily ed. Oct. 26, 1990) (statement of Sen. Helms).

324. *Id.*

325. *Id.*

326. For a modern articulation of this doctrine, see *INS v. Chadha*, 462 U.S. 919 (1983).

327. 136 CONG. REC. S17,184 (daily ed. Oct. 26, 1990) (statement of Sen. Helms).

328. *Id.* at 17,185.

[but the] five subsidiaries . . . become prohibited corporations because of the poison gas sales of the sixth.³²⁹

Though the legislation's language described the liable members of the violator's corporate family as having "knowingly assisted," Senator Helms explained that the United States legal standard of "imputing knowledge to other entities in the corporate structure [would] be followed in imposing sanctions."³³⁰

Another source of congressional frustration was revealed in the floor debate for the Omnibus Act. The Commerce Department had repeatedly overruled the Department of Defense's objections to export licenses. In fact, between 1985 and 1989, fourteen recommendations for denial of export licenses to Iraq were overruled by Commerce. As an additional tightening measure, the Department of Defense was given an automatic review of export licenses to Iran, Iraq, Syria, and Libya. Any dispute would be resolved by the National Security Council.³³¹

4. Life after Veto

a. *Executive Order*

President Bush pocket-vetoed the Omnibus Act, citing the lack of flexibility as the reason.

Because the veto also left the Export Administration Act of 1979 without reauthorization, the President issued an Executive Order.³³² The Executive Order established the chemical and biological weapons provisions that the Bush Administration favored. The Executive Order was greeted with derision in the Senate. "[A] reading of the November 16 Executive Order indicated that necessary flexibility meant, simply, the ability to do nothing."³³³

The Executive Order allowed sanctions to be terminated if a violating company ceased providing precursors or technology. "An offending company could ship all of the dangerous equipment to a chemical weapons plant and avoid penalty if the shipments are finished before discovery."³³⁴ In addition, the Executive Order allowed the Secretary of State to waive sanctions for national security or for-

329. *Id.*

330. *Id.* at 17,186.

331. *Id.*

332. Exec. Order No. 12,730, 3 C.F.R. 305 (1990).

333. 137 CONG. REC. S1892 (daily ed. Feb. 19, 1991) (statement of Sen. Helms).

334. *Id.*

eign policy reasons. “[T]he most disgusting regime on Earth could gas thousands of people—could even commit genocide—and the act would be excused if the Secretary [of State] was convinced that imposition of sanctions might have a bad effect on relations with that country,” declared Senator Helms.³³⁵ Moreover, Senator Helms faulted the exclusively prospective nature of sanctions dating from November 16, 1990.³³⁶ Sanctions against countries using chemical weapons against their own nationals, as when the Iraqis gassed the Kurds, do not appear in the Executive Order.

b. The 1991 Legislation

The Executive Order and the State Department’s newly announced “Enhanced Proliferation Control Initiative” notwithstanding, the bill was reintroduced in the Senate and passed in February, 1991. The House of Representatives did not share the Senate’s enthusiasm to override the President’s earlier veto. The Senate version languished in committee throughout the spring and summer. On December 10, 1991, the House wiped the slate clean by declaring in a resolution that the bill “contravenes the first clause of [the] seventh section of the first article of the Constitution of the United States³³⁷ and is an infringement of the privileges of this House and that such bill be respectfully returned to the Senate with a message communicating this resolution.”³³⁸

When the legislation was finally reported to the House on November 19, 1991, the congressional clock had been effectively turned back to early 1990. The House bill allowed the President discretion to waive sanctions if national security was affected.³³⁹ The first part of the House Report on the bill revealed the reason for the dramatic

335. *Id.*

336. *Id.*

337. U.S. CONST. art. I, § 7, cl. 1 provides: “All Bills for raising Revenue shall originate in the House of Representatives; but the Senate may propose or concur with Amendments as on other Bills.” In short, the Senate was incorrect in reintroducing S.320 before the House had an opportunity to do so.

338. H.R. RES. 267, 102d Cong., 1st Sess. (1991).

339. H.R. REP. NO. 235, 102d Cong., 1st Sess., pt. 1, at 3 (1991). Curiously, the House version ignores the objection raised by the Bush Administration to the early version. The House version requires that there must be “concurrence of the Chairman of the House Foreign Affairs Committee, the Chairman of the Senate Foreign Relations Committee and the ranking Minority Members of both committees” in any decision the President may make to waive the imposition of sanctions on a country violator in the interests of national security. Keyed to the reprogramming procedures of the Foreign Assistance Act, the waiver allows Congress to “put a hold on the President[']s waiver decision.” *Id.*

reversion to the inability of the House Ways and Means Committee and Senate conferees to resolve whether to reinstate import sanctions as part of the sanctions list.³⁴⁰ Included among the "foreign persons" liable for sanctions are "any successor entity"³⁴¹ or "an affiliate of that foreign person if that affiliate knowingly assisted . . . [and] is controlled in fact by that foreign person."³⁴²

G. *Paradoxes Multiply Meanwhile*

More than \$700 million in United States goods and technology were shipped to Iraq between 1986 and 1990 under 494 Commerce Department licenses. Returned without action were 171 applications for a value of \$157 million while 31 applications for a value of \$11 million were rejected. At the time the embargo was imposed against Iraq because of the invasion of Kuwait, 61 applications for a value of \$107 million were pending.³⁴³ Because Iraq was no longer listed as a terrorist supporting nation after 1982, the Commerce Department could deny licenses only if diversion to the Soviet Union, Eastern Europe, or China was suspected, or if the exports were likely to be used in Iraq's nuclear industry.³⁴⁴

In the House Report for the revised Chemical and Biological Weapons Control and Warfare Elimination Act of 1991, Congressman Pete Stark complained that while the bill was a good one, it did not go far enough.³⁴⁵ He praised the provisions of the bill which extended sanctions against foreign companies selling chemical or biological weapons but found fault that such sanctions did not include nuclear weapons.³⁴⁶ Stark listed foreign firms involved in nuclear proliferation as candidates for similar sanctions.³⁴⁷

The paradox of the United States export control system is that it

340. H.R. REP. NO. 235, 102d Cong., 1st Sess., pt. 1 at 4 (1991).

341. H.R. 3409, 102d Cong., 1st Sess. (1991).

342. *Id.* See also H.R. REP. NO. 235, 102d Cong., 1st Sess., pt. 2, at 12 (1991).

343. *Commerce Approved Export Licenses for Iraq*, 7 Int'l Trade Rep. (BNA) No. 42, at 1609 (Oct. 24, 1990).

344. *Id.*

345. H.R. REP. NO. 235, 102d Cong., Sess., pt. 2, at 15 (1991).

346. *Id.*

347. *Id.* Listed as involved with gas centrifuge design for Iraq were: Man Technolgien of Germany, Export-Union of Germany, H&H Metalform of Germany, Matrix-Churchill of Great Britain, Saarstahl of Germany, Schmiedemeccanica of Switzerland, Usinor-Sacilor of Great Britain, Gachot of France, Leybold of Germany, VAT of Liechtenstein, Inwako of Germany, Swift-Levick of Great Britain, Schaeublin of Switzerland, and Kavo of Germany. *Id.* Stark identified Siemens, a German conglomerate, as being interested in supplying a nuclear reactor to Iran. *Id.*

did not stop dangerous exports from reaching a renegade nation which threatened United States interests, even though the export control policy created a great deal of anxiety in the executive and legislative branches and significant expense for the affected industries. Additional pressures created by multilateral policies will be examined in Part IV, to be followed by a series of legislative alternatives in search of a better way to regulate chemical exports while, at the same time, advancing an anti-proliferation policy.

IV. GLOBAL PICTURE: FOUR MULTILATERAL APPROACHES

"As a world community, we must act, not only to deter the use of inhumane weapons like mustard and nerve gas, but to eliminate the weapons entirely," President Bush told the United Nations General Assembly in October 1990.³⁴⁸ "This isn't merely a bilateral concern. The Gulf crisis proves how important it is to act together, and to act now, to conclude an absolute worldwide ban on these weapons."³⁴⁹

The global ban envisioned by President Bush is only one of four viable international responses to the widespread availability of chemical weapons. In direct opposition lies the idea of deterrence through mutual assured destruction. Deterrence offers massive retaliation in kind as a disincentive for any first use of chemical weapons. Proponents of deterrence support the continued research and development of chemical agents in the military arsenal as well as deployment of the binary chemical weapons program.

Between the two extremes of global ban and deterrence, however, exist two more possibilities.³⁵⁰ Closer to deterrence is the proposal to create multilateral sanctions. This middle ground of global opprobrium entails providing the Geneva Protocol of 1925 some genuine enforcement power. An attempt to rally support for this concept at the Paris Conference fell disappointingly short of the mark.

The second middle position resembles the concept of the global ban. Its proponents favor the strict control of precursors and technology while possessor nations attempt to negotiate a more comprehensive ban. The Australia Group formed the core of this movement and enjoyed greater progress at its Canberra meeting in September 1989

348. *News Chronology*, CHEMICAL WEAPONS CONVENTION BULL., Dec. 1990, at 4, 10.

349. *Id.*

350. Brad Roberts, *The United States and Chemical Arms Control*, in *NEW TECHNOLOGIES FOR SECURITY & ARMS CONTROL: THREATS & PROMISE* 303, 306-08 (Eric H. Arnett ed., 1989).

than did the Paris Conference earlier in the year. The anti-proliferation forces organized through the Australia Group could have advanced their objectives even if the wider movement favoring a global ban had faltered. Multilateral anti-proliferation strategies could work just as well, while members scale down their own chemical arsenals by means of bilateral agreements.

A. Deterrence

Scoffing at protective gear as the response to a chemical weapons threat on the battlefield, and warning of the impracticalities of employing a nuclear response, proponents of chemical deterrence maintain that only the capability to retaliate *in kind* constitutes an adequate defense to a chemical threat. Only by improving its own arsenal of chemical agents can the United States maintain the clout necessary to keep not only superpowers from breaching the taboo against chemical agents but renegade nations as well.³⁵¹ Proponents asserted that:

On account of the President's own illusions that a [chemical weapons] ban will solve the problem of chemical weapons, both Mr. Bush and the Chairman of the Joint Chiefs of Staff, General Colin Powell, are being forced to do a "whistling in the dark" routine on this aspect of the Iraqi threat . . . Instead of trying simply to put a brave face on the risk of chemical attack by Iraq, and blithely assuring the public about the adequacy of the United States' ability to deal with such an attack if it comes, the Bush Administration should seize this crisis as an opportunity to walk away from its misguided policy on chemical arms.³⁵²

Critics found two flaws in the President's global ban initiative.³⁵³ The first was the illusion of the ban's "global quality" and the second was the impossibility of verification.

1. Comprehensive Ban Impossible

Because the necessary materials, technology, and converted facilities are so widely available, a global ban not only on use, but also on production and stockpiling of chemical agents, is impossible to effec-

351. For a general overview, see J. AROESTY ET AL., *DOMESTIC IMPLEMENTATION OF A CHEMICAL WEAPONS TREATY* (1989).

352. *Bush's Chemical Chickens Come Home to Roost*, CENTER FOR SECURITY POL'Y PUB. No. 90-P 79 (Aug. 9, 1990).

353. *Banning Chemical Weapons: Negotiating Unilateral U.S. Disarmament*, CENTER FOR SECURITY POL'Y PUB. No. 89-61 (Oct. 3, 1989) [hereinafter *Banning Chemical Weapons*].

tuates. If the Chemical Weapons Convention cannot become effective until every nation signs it, then the ban is doomed from the beginning. If, however, the Chemical Weapons Convention becomes effective when a certain number of countries sign, those nations will be held hostage to the possessors declining to become signatories.

[F]ew devotees of the [chemical weapons] treaty believe such an arrangement is feasible. Indeed, some chemical weapons ban advocates go so far as to say that it is unreasonable to hold United States acceptance of the ban hostage to a decision by Libya, Iraq or others to participate. They believe the goal of getting *most* nations to participate in a [chemical weapons] treaty is too important to allow the fact that *some decline* to stand in the way. *Such thinking is the very antithesis of the concept of a "global" ban.*³⁵⁴

2. Verification Impossible

When deterrence proponents focus on verification, they touch the ban's Achilles Heel. Verification, more than any other facet of the Chemical Weapons Convention, slowed the negotiation process. The highlights of the struggle over verification put forward by groups such as the Center for Security Policy illustrate the dimensions of the problem.

a. Monitoring of Chemical Agents

Unlike uranium, which is rare and expensive, the precursors for chemical weapons are common and inexpensive. Monitoring the materials needed for manufacturing chemical weapons makes the sort of verification which is successful in curbing nuclear proliferation useless for chemical weaponry. Moreover, under a binary program, chemicals themselves may be harmless until they are combined, ideally after the weapon is launched.³⁵⁵ Thus, not only lethal but harmless chemicals must be adequately tracked, complicating the process and inevitably reducing its efficacy.

b. Further Obstacles to Verification

Several other obstacles to verification exist. First, where large quantities of chemical munitions may not be tactically necessary, containers of chemical agents could be easily concealed in most inspec-

354. *Id.*

355. *Id.* See also Caleb Baker, *Lean Times for Army Will Mean Few New Programs*, DEFENSE NEWS, Feb. 11, 1991, at 10.

tions. Second, because the process of manufacturing nonmilitary chemical products resembles that for producing chemical weapons, plants can be disguised as pesticide or pharmaceutical producers, frustrating inspection. Third, because artillery shells or SCUD missiles can easily be adapted to deliver a chemical payload, controlling the method of delivery for chemical weapons is not feasible. Finally, even though the 1972 Biological Weapons Convention was supposed to end the threat of biological warfare, there is "considerable evidence that other signatories are systematically violating the [Biological Weapons] Convention."³⁵⁶

c. Aggressive Verification Burdens the Chemical Industry

Any system of verification will burden the chemical industry. However, proponents downplay this because the chemical industry favored the Chemical Weapons Convention. Many of the snags in negotiating, nevertheless, may be traced to the burden on industry. The United States chemical industry offered some concessions to negotiators. If their proprietary rights enjoy protection, the industry will cooperate with verification; indeed, they have offered to develop the prototypical inspection regime.³⁵⁷

The chemical industry has been forced to accept small victories in exchange for large sacrifices in other arenas. For example, the industry agreed to sanction the entire corporate family in exchange for the removal of patent forfeitures from the Export Administration Amendments. In the Commerce Department's new rules to govern proliferation, the industry was forced to accept sweeping controls of nickel alloy equipment in exchange for concessions related to production control equipment.

3. Proof in the Gulf War?

United Nations Resolution 678, adopted on November 29, 1990, perfectly exemplifies the force of deterrence. The resolution authorized "member states cooperating with the government of Kuwait . . . to use *all necessary* means to uphold and implement Security Council Resolution 660 (1990) and to restore international peace and security in the area."³⁵⁸ The Japanese foreign minister warned Iraq specifi-

356. *Banning Chemical Weapons*, *supra* note 353, at 3.

357. *CMA's Olson Unravels Intricacies of Verifying a Chemical Arms Treaty*, CHEMICAL & ENGINEERING NEWS, Apr. 24, 1980, at 167-72.

358. *News Chronology*, *supra* note 348, at 12 (emphasis added).

cally against using chemical weapons.³⁵⁹ Prince Khalid Bin-Sultan, the Saudi commander of the joint forces, warned Saddam Hussein in August, 1990:

[W]e are fully aware of his limited capabilities, and we also know—and he knows it full well—that should he use [chemicals] it would cause the total destruction of Iraq. At the same time, with regard to the Saudi Armed Forces, we are prepared for this type of warfare.³⁶⁰

Given these warnings of devastating retribution coupled with the United States' stern warnings, it may be concluded that the absence of chemical weapons in the war for Kuwait resulted from deterrence.

Proponents of defense theories based on deterrence assert that deterrence represents the only practical policy, although they respect the notion of tandem policies. "America's energies in the chemical weapons areas ought to be focused on the maintenance of modest chemical retaliatory capabilities and the destruction of the preponderance of obsolescing United States . . . stockpiles."³⁶¹ "At the same time, the United States should seek to provide means of *enforcing the present arms control regime banning first-use* of chemical weapons."³⁶²

As the war with Iraq approached, however, the Bush Administration stood firmly in the middle, neither embracing nor rejecting the concept of retaliation in kind. On August 14, 1990, United States Defense Secretary Richard Cheney stated that he could conceive of no situation in which the United States would use chemical weapons.³⁶³ Only two days later, United States Ambassador Stephen Ledogar told the Conference on Disarmament that "if [United States troops] are attacked with chemical weapons, we must have a variety of response options, including the option to respond in kind so long as we still have some chemical weapons."³⁶⁴ After the war for Kuwait ended, however, President Bush abandoned the idea of "retaliation in kind." He announced in May 1991, that the United States would destroy its chemical weapons stockpile within ten years, retaining none of the defensive reserves authorized by the bilateral treaty with the Soviet

359. *Japanese Minister Warns Iraq on Chemical Weapons*, BBC SUMMARY OF WORLD BROADCASTS, Feb. 14, 1991, at FE/0996/A4/1.

360. *News Chronology*, *supra* note 348, at 8.

361. *Banning Chemical Weapons*, *supra* note 353, at 5.

362. *Id.*

363. *News Chronology*, *supra* note 348, at 6-7.

364. *Id.* at 7.

Union and the draft of the Chemical Weapons Convention.³⁶⁵

B. Global Ban: Chemical Weapons Convention

The multilateral initiative intended to replace United States dependence on deterrence, and to take precedence over unilateral efforts to control the proliferation of chemical weapons, focuses on eradicating chemical arsenals. Under the terms of the initiative, declared possessors of chemical weapons must dismantle their production programs and destroy their stockpiles. The Chemical Weapons Convention (the "Convention") tabled by the United States in 1984 at the United Nations proposed a forty-nation disarmament conference in Geneva.

1. The Draft Convention

The "Report of the Ad-Hoc Committee on Chemical Weapons to the Conference on Disarmament" is the full title for the informal term: the "Rolling Text" ("Report" or "Rolling Text"). During the drafting period, twenty Articles, eight Annexes, and a Protocol of Inspection Procedures composed the 130 pages of the first appendix to the Report. The second appendix contained provisions under development or already discarded. "Every word that goes into the report, be it appendix I or appendix II, requires consensus of the forty participating states."³⁶⁶

a. Article I: The Promise

Signatories promise not to "develop, produce, otherwise acquire, stockpile or retain chemical weapons, or transfer, directly or indirectly chemical weapons to anyone."³⁶⁷ The first article clearly forbids the use of chemical weapons and mandates the destruction of both weapons and facilities which produce them.³⁶⁸

365. Michael R. Gordon, *U.S. Weighs a Plan for Arms Control in the Middle East*, N.Y. TIMES, May 14, 1991, at A1. President Bush announced: "We are formally forswearing the use of chemical weapons for any reason, including retaliation, against any state, effective when the convention enters into force. The United States unconditionally commits itself to the destruction of all our stocks of chemical weapons within ten years of entry into force." *Id.*

366. Johan Molander, *Negotiating Chemical Disarmament*, CHEMICAL WEAPONS CONVENTION BULL., Feb. 1990, at 3. By the time this Article went to press, the Chemical Weapons Convention had been opened for signature in Paris, with more than the required signatures to officially enact it by January 15, 1993.

367. *Id.*

368. *Id.*

b. Article II: Definition

If a nation intends to use a chemical as a weapon, that chemical comes within the definition of the Convention. By pinning the definition to the intent, negotiators built flexibility in the Convention to keep pace with technological advances. Chemical weapons covered by the Convention fall into three categories:

- i. toxic chemicals and their precursors,
- ii. specially designed munitions, and
- iii. equipment specifically designed for use in deployment.

Though the United States and the former Soviet Union represent the only two self-declared possessors of chemical weapons and though the two nations agreed to extensive dismantling of their own chemical programs,³⁶⁹ the Convention is aimed at the programs of every country.

c. Article III: Declarations

The Convention requires each signatory to publicly declare its obligations under the agreement. For example, each signatory nation must declare whether there are any chemical weapons under its jurisdiction. Further, each signatory must declare whether any chemical weapons are on its territory. The Convention also requires a signatory to declare if "it has transferred or received any chemical weapons and . . . [if] it has transferred or received from anyone the control over such weapons" from a specific date yet to be decided.³⁷⁰

The Convention requires similar declarations about chemical weapons production facilities, including the "precise location, nature and general scope of activities of any facility and establishment on its territory or under its jurisdiction," including laboratories and test sites.³⁷¹ To combat the problems created by the vast scope of these declarations, negotiators generated questionnaires that can be answered either "yes" or "no."³⁷²

369. See *Union of Soviet Socialist Republics—United States: Agreement on Destruction on Non-Production of Chemical Weapons and on Measures to Facilitate the Multilateral Convention on Banning Chemical Weapons*, reprinted in 29 I.L.M. 932 (1990).

370. Thomas Stock & Ronald Sutherland, *Objectives and Requirements of a National Body, Based on Implicit Suggestions in the Current Rolling Text of the Chemical Weapons Convention*, in NATIONAL IMPLEMENTATION OF THE FUTURE CHEMICAL WEAPONS CONVENTION 15 (Thomas Stock & Ronald Sutherland eds., 1990).

371. *Id.* at 16.

372. *Id.*

d. Articles IV and V: Destruction and Verification

In conjunction with detailed annexes, Articles IV and V outline a ten year plan to destroy and verify the destruction of chemical weapons. The time table set out in Articles IV and V declares:

Complete destruction is to be achieved within ten years. Should a State Party, in exceptional cases, for technological, financial, ecological or other reason not be in a position to do so, the Convention allows for the possibility of extending this time frame by up to five more years. Furthermore, in exceptional cases of compelling need, Article V permits State Parties to convert, rather than destroy, chemical weapons production facilities, but only under strict conditions designed to prevent their possible reconversion.³⁷³

e. Article VI: Exceptions

Signatories may continue to develop, produce, or transfer chemicals as long as the end product is not a weapon. This provision divides control requirements by degree of chemical toxicity. The first category includes the organophosphorus nerve agents: VX, Tabun, Sarin, and Soman, as well as mustard and BZ. These chemical agents are rated by toxicity rather than the method of production, and some of them overlap with the biological agent category.³⁷⁴ The second category of control is the super-toxic chemicals that are lethal by themselves. This category consists of Phosgene, hydrogen cyanide, cyanogen chloride, phosphorus oxychloride, and phosphorus trichloride. Thioglycol is also in the second category because it yields mustard after adding hydrochloric acid. The third category contains the key precursors that possess nonmilitary as well as military uses. Chemicals containing P-methyl, P-ethyl, or P-propyl bonds along with pinacolyl alcohol are in this category. In 1989, a fourth category emerged to include industrial chemicals with weapon potential. This includes methyl isocyanate which accidentally killed thousands of people in Bhopal, India in 1984. By dividing the agents in this fashion, different degrees of risk translate to different levels of monitoring.³⁷⁵ No explicit restrictions were placed on dual-use equipment.³⁷⁶ The final draft of the Convention requires that provisions be imple-

373. Adolph Ritter von Wagner, *The Draft Chemical Weapons Convention*, 17 CHEMICAL WEAPONS CONVENTION BULL., Sept. 1992, at 1, 3.

374. Ricin exemplifies an agent in this third category. See AROESTY ET AL., *supra* note 351, at 8.

375. AROESTY ET AL., *supra* note 351, at 7-8.

376. von Wagner, *supra* note 373, at 3.

mented in a manner that does not hamper the economic and technological development of the signatories.³⁷⁷

f. Articles VII and VIII: Organizational Structure

Each signatory state will develop a National Authority empowered to implement the Convention. An International Organization with a Technical Secretariat will oversee the Convention worldwide. The latest estimate of the cost is \$800 million over the first fifteen years of the Convention's life.³⁷⁸

g. Articles IX: Challenge Inspections

Article IX was probably the most controversial and hotly debated provision of the Convention. It sets out the parameters for a challenge inspection to reinforce on-site inspection and material accounting. The challenge inspection agreement has been called:

[A] novelty in the verification of a universally applicable arms control and disarmament treaty . . . [which] constitutes a politically sensitive concept [and] which balances carefully the verification interests of a State Party and of the international community and the interest of the inspected State Party to protect sensitive information not related to the Chemical Weapons Convention.³⁷⁹

h. Articles X and XII

Article X details how signatories may protect themselves from chemical weapons. It represents one of the "built-in safeguards of the Convention to protect States Parties against the eventuality of the hypothetically continuing risk of being threatened or attacked by chemical weapons."³⁸⁰ Article X provides for three major systems to aid signatory states. First, it provides voluntary funds for assistance by the Conferences of States Parties. Second, it assures assistance through the organization if chemical weapons are actually used against a State Party, or so threatened. Third, it also provides for immediate emergency assistance from other States Parties.³⁸¹

Serving as the "principal safeguard of the Convention to protect the States Parties against violations," Article XII gave the authority

377. *Id.*

378. *News Chronology, supra* note 348, at 10.

379. von Wagner, *supra* note 373, at 3.

380. *Id.*

381. *Id.*

to order remedies, including sanctions, for "any situation which contravenes the provisions of the Convention."³⁸²

2. Fundamental Requirements on Signatories

A signatory to the Convention must meet several requirements as soon as the Convention enters into force. First, within thirty days of the Chemical Weapons Convention's effective date, signatories must declare all stockpiles and recent transfers. Then, each signatory will have ten years to destroy everything. Second, once a signatory declares its production facilities, it must stop all activity except that necessary to close the facility. Third, the Convention allows small quantities of super-toxic weapons and key precursors for deterrence against chemical attack as well as for research and medical use. President Bush summed up how the Chemical Weapons Convention would affect the United States:

Today, I want to announce steps that the United States is ready to take—steps to rid the world of these truly terrible weapons—toward a treaty that will ban—eliminate—all chemical weapons from the Earth [ten] years from the day it is signed. This initiative contains three major elements.

First, in the first [eight] years of a chemical weapons treaty, the United States is ready to destroy nearly all—[90%]—of our chemical weapons stockpile, provided the Soviet Union joins the ban. And I think they will.

Second, we are ready to destroy all of our chemical weapons—100% every one—within [ten] years, once all nations capable of building chemical weapons sign that total ban treaty.

And third, the United States is ready to begin now. We will eliminate more than 80% of our stockpile, even as we work to complete a treaty, if the Soviet Union joins us in cutting chemical weapons to an equal level, and we agree on the conditions, including inspections, under which stockpiles are destroyed.³⁸³

The estimated cost to the United States for its participation in the Convention is just under \$400 million during the first fifteen years of the treaty's life.³⁸⁴

382. *Id.*

383. *Conference Against Chemical Weapons*, DEP'T ST. BULL., Nov. 1989, at 45.

384. *News Chronology*, CHEMICAL WEAPONS CONVENTION BULL., Dec. 1990, at 10. The following were the anticipated signatories to the Chemical Weapons Convention which was reported to the United Nations on September 3, 1992: Albania, Algeria, Argentina, Armenia, Australia, Austria, Azerbaijan, Belarus, Belgium, Bolivia, Bosnia-Herzegovina, Brazil, Bulgaria, Canada, Chile, Columbia, Croatia, Cyprus, Czechoslovakia, Denmark, Ecuador, Estonia,

3. Bilateral Prodding

The former Soviet Union and the United States agreed to reduce the aggregate quantity of their respective stockpiles by one-half before the end of 1999. Further, they agreed to bring the aggregate total to under 5000 tons by the end of 2002.³⁸⁵ "The Soviet-United States bilateral agreement was designed to provide new impetus to the conclusion of a comprehensive verifiable global chemical weapons ban at the earliest possible date."³⁸⁶

Although the Soviets have met each proviso that President Bush set out in his statement on the United States' willingness, another condition may be harder to meet.

More controversial is President Bush's statement that the United States would not agree to eliminate all of its chemical weapons stocks until "all nations capable of building chemical weapons signed that total ban treaty." [N]ations that have signed the treaty would not give up all their stores of poison gas as long as a single country that could make chemical weapons, such as Libya, refuses to go along with a treaty.³⁸⁷

In answer to the criticism that a single nation would have complete veto power over the Convention, the Bush Administration argued that the provision might encourage "recalcitrant third world nations to go along with a global ban."³⁸⁸ Given the President's announcement in May 1991, promising the unilateral destruction of the entire United States chemical arsenal, the debate seems moot.

Buoyed by the success of the bilateral treaty with the Soviets, President Bush reiterated his goal in the Executive Order that reauthorized the Export Administration Act after his veto of the 1990 amendments bill:

It is the policy of the United States to lead and seek multilaterally coordinated efforts with other countries to control the proliferation

Finland, France, Georgia, Germany, Greece, Holy See, Hungary, Iceland, India, Ireland, Italy, Japan, Kazakhstan, Kenya, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Moldova, Monaco, Mongolia, Morocco, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Paraguay, Peru, Poland, Portugal, Romania, Russian Federation, San Marino, Slovenia, South Korea, Spain, Sweden, Switzerland, Tajikistan, Turkey, Turkmenistan, Ukraine, United Kingdom, United States, Uruguay, Uzbekistan, Venezuela, and Yugoslavia. CHEMICAL WEAPONS CONVENTION BULL., Sept. 1992, at 26-27.

385. See 1990 Soviet-American Treaty, art. IV, reprinted in 29 I.L.M. 932, 933 (1990).

386. Conference on Disarmament Continues Work on Chemical Weapons Accord, UN MONTHLY CHRON., Sept. 1990, at 34.

387. Michael R. Gordon, *Neutralizing Poison Gas*, N.Y. TIMES, Sept. 26, 1989, at A1.

388. *Id.*

of chemical and biological weapons. The Secretary of State shall accordingly ensure that the early achievement of a comprehensive global convention to prohibit the production and stockpiling of chemical weapons, with adequate provisions for verification, shall be a top priority of the foreign policy of the United States.³⁸⁹

4. Verification

Verification has two prongs. First, governments and their producers must report the existence of chemicals and production facilities. Second, signatories demand inspection evidence that there exists no further production of chemical weapons in any participating country. Opponents of the Convention maintained that verification is an impossibility; they asserted that countries can change production facilities from weapons grade chemicals to innocuous commercial chemicals in a matter of hours.³⁹⁰ That notion was debunked when the chemical industry deemed it better to become an active participant than a spectator.³⁹¹

a. Modes of Inspection

Holding signatories to their promises involves four levels of verification. First, if signatories agree never to use chemical weapons in war, then the world must develop means to accurately determine whether chemical agents are present on the battlefield. Second, if the

389. Exec. Order No. 12,730, 55 Fed. Reg. 48,587 (1990).

390. Speaking of the invitation for the press to inspect the facility at Rabta, Libya, then CIA Director William Webster told Congress: "[W]ithin fewer than [twenty-four] hours, some say [eight and one-half] hours, it would be relatively easy for the Libyans to make the site appear to be a pharmaceutical facility. All traces of chemical weapons production could be removed in that amount of time." *Chemical and Biological Weapons Threat: The Urgent Need for Remedies: Hearings of the Senate Committee on Foreign Relations*, 101st Cong., 1st Sess. 33 (1989).

391. Kyle B. Olsen of the Chemical Manufacturers Association stated in an interview:

I don't think anyone can really say authoritatively that [a nerve gas facility can be disguised in 12 hours] Simply to make the change from one product to another is not enough. . . . [Y]ou also have to address traces of the illicit product. . . . [A] plant designed to be able to make an incredibly quick shift would be very costly to build. . . . [M]odern analytical methods [are] capable of detecting things down to parts per billion or parts per trillion [so] there is always a chance of detecting something. . . . [S]eals, the gaskets on the pumps and various other fittings, the agitator in the vessel, and various rubber components and grease seals, have a tendency to pick up traces of the material. . . . Yes, it is probably possible to make a changeover fairly quickly. But can you do it in such a way that you eliminate all traces? That is a trickier proposition than simply switching a few pipes and a couple of control systems around.

CMA's Olsen Unravels Intricacies of Verifying a Chemical Arms Treaty, CHEMICAL & ENGINEERING NEWS, Apr. 24, 1990, at 167-70.

Convention allows some activities, such as research, to continue, then the world must develop the ability to determine the difference between research facilities and production facilities. Third, if the Convention forbids certain activities, the world must develop the means to assure that those activities are not occurring anywhere in the participating country. Fourth, if compliance with the Convention derives from the signatories' confidence in fellow participants, then the world must devise ways to reassure everyone of universal compliance.

i. Verification of Non-Use

The Geneva Protocol of 1925 sets the standards for non-use. To accurately verify compliance, a host of verification capabilities must be developed:

- [a.] The ability to collect samples from a combat region that may be contaminated . . . and transport for analysis.
- [b.] The ability to detect and identify the presence of known [chemical] agents in physical and biomedical samples collected from the site of alleged use, against a natural background, possibly in minute quantities.
- [c.] The ability to detect and identify the presence of [chemical] agents whose identities may not be known, in physical and biomedical samples
- [d.] In the event a [chemical] agent has been used which has a naturally-occurring counterpart, the ability to determine that the presence of such agent constitutes a violation of the Protocol.
- [e.] The ability to distinguish epidemiologically that the occurrence of illness or trauma is the result of the use of [chemical] agents, as opposed to endemic disease or other means of warfare.³⁹²

ii. Verification of Permitted Activities

Using routine, ad hoc, and challenge inspections, the original draft of the Convention, tabled at the disarmament conference by George Bush, envisioned signatories cooperating to handle the inspection of commercial chemicals that could have chemical weapons potential. The capabilities necessary included:

- [a.] Routine chemical analysis, either in situ or off-site, including detection and identification of trace components.

392. Barbara A.B. Seiders, *Verification of Chemical Weapons Arms Control*, in *NEW TECHNOLOGIES FOR SECURITY & ARMS CONTROL* 313, 315 (Eric H. Arnett ed., 1989).

- [b.] Toxicological analysis.
- [c.] Chemical production process sampling and analysis, manned and remote.
- [d.] Area surveillance, manned and remote.
- [e.] Inventory and stockpile counting.
- [f.] Non-destructive and/or destructive analysis of munitions.
- [g.] Local and area communications.³⁹³

For the technology to accomplish this verification, Convention participants must depend on the chemical industry. That dependence afforded the chemical industry a high degree of leverage in shaping the verification component of the Convention.

iii. Verification of Compliance with Prohibited Activities

Cooperation can be expected to verify permitted activities but is unlikely if a signatory country intends to hide noncompliance. Therefore, the scope of verification in this realm must be different:

[a.] The ability to detect and identify, at any given time, the chemicals being manufactured in any facility otherwise capable of manufacturing chemical agents [is required]. Such facilities include recognized [chemical weapons] production facilities, as well as facilities located in ostensibly legitimate industrial chemical complexes.

[b.] If a party makes a national determination that it has detected and identified such clandestine production, it must be able to persuade the international inspectorate of the basis of its concern, without jeopardizing the sources of information . . . [I]t must be able to demonstrate that such production is not consistent with the activities permitted by the Convention.³⁹⁴

iv. Miscellaneous Measures

Examples of measures designed to enhance the mutual confidence of the signatories included "data exchanges, mutual visits to facilities to be covered by an agreement, and arrangements to allow parties to 'practice' verification procedures."³⁹⁵ The task is not necessarily hopeless. Even assuming that weapons precursor chemicals are as ephemeral as carbon tetrachloride, both evident consumption and price fluctuation will signal their diversion, in any quantity, from legitimate industrial use. Once a study of legitimate consumption quan-

393. *Id.* at 316.

394. *Id.* at 318.

395. *Id.* at 319.

tifies a baseline loss figure in any particular industrial application, any departure from that normally recurring loss should trigger alarm. Moreover, even covert diversions of industrially valuable chemicals to military use should produce telltale increases in demand and price. From either of these signals, the path points either to an ordinary sale to a new customer, or an extraordinary sale to an old customer.

Only political considerations define the nature of the watchdog. A supplier sufficiently motivated by harsh sanctions for careless distribution or a bureaucratic office adequately staffed and supported will suffice. Presently functioning regulatory systems offer mature models for methods to track where weapons precursor chemicals are held, transferred, or lost. Such systems make verification feasible; other systems, such as unscheduled workplace safety inspections, make it reliable.

b. Industry's View of Verification

The chemical industry devised a challenge inspection regime based on taking four samples. One sample would analyze on-site chemicals with a portable gas chromatograph and mass spectrometers, thus eliminating chain of custody problems. The manufacturer would analyze the second sample as a check. The third sample would be taken off-site for detailed analysis. The fourth sample would be locked into a tamperproof container on-site for retesting at a later date. To prove the efficacy of the regime, the industry made a trial inspection at the Akzo plant in Gallipolis Ferry, West Virginia.³⁹⁶

c. Level of Intrusiveness: Recordkeeping Challenges

Because large proportions of chemicals are lost in the manufacturing process—as much as 5% for Phosgene—keeping track of chemicals by bookkeeping alone could not accurately account for large quantities. Carbon tetrachloride, for example, is widely used in the manufacture of chlorofluorocarbons. In a process that consumed 580 million pounds of chemical in 1985, 2.7% could not be accounted for by bookkeeping. “If this is accurate, it implies that 15.7 [million pounds] of carbon tetrachloride could be lost in the production process. If this chemical is typical of even a few of the treaty chemicals, then a large amount . . . could be diverted for [chemical weapons] agent production without being detected by accounting

396. See *Foreign Relations Hearings*, *supra* note 19, at 171.

procedures.”³⁹⁷

Signatories, moreover, must believe that other signatories have declared all their stockpiles and production facilities. Negotiators accepted a provision for the challenge inspection:

Each State Party has the right to request an on-site inspection in any other State Party in order to clarify any matter which causes doubts about compliance with the provisions of the Convention, or any concern about a matter pertaining to the implementation of the Convention and which is considered ambiguous, and to have this inspection conducted anywhere, at any time and without delay by a team of inspectors designated by the Technical Secretariat. The inspection shall be mandatory, with no right of refusal.³⁹⁸

Some states, however, worry that such a challenge may become a bilateral affair between the challenger and the challenged, leaving the multilateral apparatus out entirely.³⁹⁹ At the same time, other verification proposals include routine inspections, random inspections, inspections based on probable cause, and limitations on how many challenge inspections one country may require of another given country.

d. Burden on the Chemical Industry

It is undisputed that the chemical industry will bear the burden of verification. A challenge inspection under the Convention intrudes profoundly on the targeted facility. However, in the United States, the industry is already heavily regulated. In *Marshall v. Barlow's, Inc.*,⁴⁰⁰ the United States Supreme Court held that an ex parte warrant can be obtained for an inspection if entry to a government inspector is refused.⁴⁰¹ The Court reasoned that because the industry was regulated already, it was unnecessary to show cause beyond reasonable regulatory requirements. In short, the chemical industry must expect such inspections.⁴⁰²

Although the chemical industry cannot resist on the grounds

397. AROESTY ET AL., *supra* note 351, at 37.

398. Molander, *supra* note 366, at 5-6.

399. *Id.* at 6.

400. 436 U.S. 307 (1978).

401. *Id.* at 26.

402. *Cf. Dow Chem. Co. v. United States*, 476 U.S. 227 (1986) (casting doubt on the permissiveness of the warrantless search in a regulated industry). See also Edward Tanzman, *Legal Aspects of Implementation under Domestic Laws*, in IMPLEMENTING A GLOBAL CHEMICAL WEAPONS CONVENTION 15, 17 (Eric H. Arnett ed., 1989).

that inspections amount to warrantless searches, the industry may contend that the collection of data and wider access to that data will erode their proprietary rights. Additional reporting requirements will dovetail into a wide collection of reporting regulations already in place. The opening of these reports to inspectors from the Technical Secretariat under the Convention could exacerbate the revelation of industry secrets.⁴⁰³

The chemical industry is subject to numerous following regulations. First, more than 65,000 chemicals comprised the first listing under the Toxic Substances Control Act,⁴⁰⁴ with a thousand new chemicals entering the market every year since. Key precursors are included unless listed as pesticides or subject to a national security waiver. Second, under the Federal Insecticide, Fungicide, and Rodenticide Act ("FIFRA") "[n]one of the [chemical weapons] agents and probably none of the key precursors identified in the treaty is now a registered pesticide."⁴⁰⁵ However, laboratories, distributors, retailers, commercial and private applicators, and importers register under FIFRA.⁴⁰⁶ Third, the Occupational Safety and Health Act ("OSHA")⁴⁰⁷ provides the prototype for the sort of challenge inspection envisioned in the Convention. Fourth, as part of the Solid Waste Disposal Act of 1965, the Resource Conservation and Recovery Act ("RCRA")⁴⁰⁸ mandates a waste management system that charts chemicals from their creation to their disposal. RCRA would certainly be implicated in the destruction of hazardous chemical weapons stockpiles. Last, the Comprehensive Environmental Response, Compensation and Liability Act and Superfund Amendments ("CERCLA") would affect the disposal of hazardous chemical weapons if there exists a danger of release into the environment.⁴⁰⁹ CERCLA might require additional reporting to allow safety officials to prepare responses should the substances be accidentally released.

5. Proliferation Not Addressed

Besides the difficulties of destruction and verification, another inherent flaw exists in the original Convention. This flaw is the absence

403. See AROESTY ET AL., *supra* note 351, at 23.

404. 15 U.S.C. §§ 2601-2629 (1988).

405. AROESTY ET AL., *supra* note 351, at 25.

406. 7 U.S.C. §§ 121-136 (1988).

407. 29 U.S.C. §§ 651-678 (1988).

408. 42 U.S.C. §§ 6901-6987 (1988).

409. 42 U.S.C. §§ 9601-9657 (1988).

of restrictions regarding the private brokering of precursor chemicals and technology to non-signatory nations.⁴¹⁰

Both the [Convention] Draft and the Rolling Text are virtually silent about detailed methods for monitoring and controlling the international transfer of chemicals, technology . . . and know-how that could result in the further proliferation of [chemical weapons] capability.⁴¹¹

The dual goals of banning chemical weapons and tightening control on the export of precursors and technology run on parallel tracks. Though a different apparatus advances each goal, one track exerts a profound influence upon the other, thus requiring tandem construction lest the engine of total eradication be derailed.

C. *Global Opprobrium: 1989 Paris Conference*

For five days in January 1989, representatives of 140 nations debated the full range chemical weapons issues. The incoming Bush Administration hoped for an endorsement of the global ban on production. That endorsement was not forthcoming. Instead, the nations reaffirmed the Geneva Protocol of 1925 condemning the first use of chemical weapons in war.

1. Optimists

General William F. Burns, deputy head of the United States delegation, phrased the outcome optimistically, calling the nonbinding declaration of the conference participants "a powerful global consensus."⁴¹² This assessment, however, proved to be a minority view.

Shortly after the Conference concluded, General Burns told Congress that "[t]he purpose of the Paris Conference was not to single out individual nations for past use of chemical weapons."⁴¹³ Any condemnation was intended to be prospective. In addition, the Conference was not meant to be "a negotiating forum in which to revise . . . international norms [against chemical weapons use]."⁴¹⁴ Thus, denying that anything new was expected, General Burns tempered the disappointment in the Conference's outcome. The central purpose,

410. AROESTY ET AL., *supra* note 351, at 4.

411. *Id.* at 7.

412. See Michael R. Gordon, *Paris Conference Condemns the Use of Chemical Arms*, N.Y. TIMES, Jan. 12, 1989, at A1.

413. *Foreign Relations Hearings*, *supra* note 19, at 214.

414. *Id.*

Burns asserted, was merely to "restore the authority of existing constraints, chiefly the Geneva Protocol."⁴¹⁵

The United States certainly had hoped that the Conference would accomplish more. However, General Burns limited those hopes to those articulated in Secretary of State George Shultz's keynote address:

[a.] International support for the U.N. Secretary General's investigation of allegations of [chemical weapons] use.⁴¹⁶

[b.] Support for appropriate action, in conformity with the United Nations Charter, in the event of future illegal use of chemical weapons⁴¹⁷

[c.] Support from the international community for humanitarian aid for victims of [chemical weapons] use.⁴¹⁸

General Burns found solace in the common themes of the plenary statements of Conference participants:

[a.] Participating states reaffirmed their commitment to the Geneva Protocol. Moreover, fourteen states [agreed to sign on].

[b.] Participants stressed the importance of the ongoing negotiations in Geneva and the need to achieve a total ban on chemical weapons

[c.] Nations repeatedly underlined the importance of the process of the Secretary General's investigations into chemical weapons use.⁴¹⁹

Finally General Burns painted the brightest possible face on the Conference by summarizing its achievements:

[a.] The conference condemned the use of chemical weapons in violation of international law and existing norms.

[b.] Participants stressed the importance and continuing validity of the Geneva Protocol.

[c.] Participants expressed grave concern over the spread of chemical weapons, and called on all states to exercise restraint and act responsibly.

[d.] The Conference reaffirmed full support for the Secretary General's [investigations].

415. *Id.*

416. This represented a change in United States policy since 1988.

417. In particular, sanctions were encouraged. *Foreign Relations Hearings, supra* note 299, at 214.

418. *Id.*

419. *Id.* at 215.

[e.] Participants also supported humanitarian assistance given to victims affected by chemical weapons.

[f.] The Conference called for negotiation of a global, comprehensive, and effectively verifiable ban, of unlimited duration, on all chemical weapons.⁴²⁰

Despite this optimistic assessment, even the most unsophisticated observer could conclude that little progress occurred at the Paris Conference.

2. The Critics

While the condemnation of chemical weapons at the Paris Conference was a “unique manifestation of international unity,” the United States failed to institute a “swift policy review” to bring its negotiating position at Geneva in line.⁴²¹

Rolf Ekeus, former Swedish ambassador to the Geneva Conference, probed the disappointing result of the Paris Conference deeper.⁴²² The Paris Conference represented a weak response to chemical weapons use in the Iran-Iraq war. Even though the Conference produced a consensus to reaffirm the Geneva Protocol of 1925, “[t]his outcome was held in jeopardy until it proved possible . . . to deflect an initiative by some of the Arab states to make the Conference justify the threat and use of chemical weapons as a means to offset a real or presumed nuclear weapons threat.”⁴²³

Moreover, doubts quickly arose that militarily advanced nations had convinced Third World countries that chemical weapons are not a viable equivalent to nuclear capability. Convincing nations without nuclear capability to foreswear chemical weapons was difficult when the two major powers—the United States and the former Soviet Union—insisted on retaining their option to use their chemical arsenals for deterrence and retaliation.⁴²⁴ Calling the chemical weapons sections of joint communiqués “shadow-boxing,” an observer upbraided the “great powers” for their “hesitation and lack of resolve with regard to the fundamental step of renouncing all use.”⁴²⁵

Indeed, some believe that the “most remarkable thing” about the

420. *Id.* at 215-16.

421. See Molander, *supra* note 366, at 8.

422. Rolf Ekeus, *The Option of Using Chemical Weapons*, CHEMICAL WEAPONS CONVENTION BULL., June 1990, at 2-3.

423. *Id.* at 2.

424. *Id.* at 3.

425. *Id.*

Paris Conference was "that it happened at all, given that the trigger for it was widespread acceptance of Iraq's use of chemical weapons in the [first] Gulf War."⁴²⁶ Moreover, the admission by world governments that poison gas had indeed been used against Iran arose from the thoroughness of the United Nations investigation of the Iranian complaints.⁴²⁷

The Paris Conference was criticized for "advertising the weapons it was supposed to eliminate."⁴²⁸ After four days of deliberation all that the nations could muster was a communique voicing concern. The communique was not even bold enough to name Iraq as the offending party. Moreover, while supporting the "urgent" advancement of negotiations for the Convention, the Paris meeting actually deepened some of the rifts among the negotiating parties.⁴²⁹

The timing of the Conference—within days of the United States' shooting down two Libyan fighter jets over the Mediterranean—was most unfortunate.⁴³⁰ Nor were the increasingly shrill accusations over West Germany's involvement with Libya's Rabta facility helpful. "Some Arabs . . . came to Paris in no mood to ban chemical warfare. They say it is unfair to ask some countries to give up the right to make chemical weapons while others [such as Israel] keep nuclear ones."⁴³¹ It must be noted that a linkage between chemical and nuclear weapons may yet undermine the Convention.

D. Voluntary Control: Australia Group

Twenty-two nations originally comprised the Australia Group.⁴³² Its purpose was to provide interim proliferation control while the Convention was still under negotiation. As an informal association, the Australia Group established no requirements for its

426. Ian Curtis, *Europe Falter, Then Responds on Libyan CW*, DEF. & FOREIGN AFF., Jan. 1989, at 41.

427. In 1988, British Foreign Secretary Sir Geoffrey Howe proposed beefing up the United Nations' powers to investigate alleged chemical weapons attacks. He was supported by the Soviet Union but opposed by the United States and France. *Id.*

428. *Chemical Weapons; A Cloud of Talk*, THE ECONOMIST, Jan. 14, 1989, at 28.

429. *Id.*

430. *Id.*

431. *Id.*

432. The following countries formed the original Australia group: Australia, Austria, Belgium, Canada, Denmark, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Switzerland, the United Kingdom, and the United States. Finland and Sweden later joined to expand the group's number to twenty-two. At the end of 1992, Argentina and Hungary also were expected to join.

participants' conduct.⁴³³

In terms of practical action, the Australia Group developed a list of precursors and targeted Iran, Iraq, Syria, and Libya for export controls. However, the Australia Group applied no collective sanctions and its authority emerges from consensus.

The Australia Group met twice yearly to informally advance the objectives of the Convention and to share intelligence on suspected chemical weapons development.⁴³⁴ At the June, 1990 meeting in Paris, the Australia Group agreed to extend its counter-proliferation efforts to "technology and equipment as well as listed chemicals."⁴³⁵

1. Domestic Impact of Australia Group

This decision prompted a flurry of activity in the United States Departments of Commerce and State. The result was the "Enhanced Proliferation Control" policy, to be implemented through administrative agency rule making. On March 13, 1991, the agency published interim rules that expand the lists of chemicals and destinations controlled, as well as equipment, technology, and know-how.⁴³⁶ In addition, the agency issued a proposed rule on March 13, 1991 governing the question of scienter.⁴³⁷

The rules "are not multilateral in nature," complained a representative of the Chemical Manufacturers Association. "[T]he United States is not the sole source of the controlled materials and technology, and curbs should be agreed upon among nations."⁴³⁸ Because the controlled equipment is as "commonplace and benign as nickel pipe, ventilation ducts and pumps used for making fertilizer, as well as smokestack scrubbers used to remove air pollutants,"⁴³⁹ industry analysts fear that the United States will carry a disproportionate burden. Because the Australia Group possessed no sanctioning power, nor any apparatus to enforce or police compliance of its members, industry could not be assured of the multilateral application of the restrictions. "What makes business most nervous is the unilateral ap-

433. NATIONAL ACADEMY OF SCIENCES, FINDING COMMON GROUND: U.S. EXPORT CONTROLS IN A CHANGED GLOBAL ENVIRONMENT 71 (1991) [hereinafter SCHMITT REPORT].

434. Clyde G. Farnsworth, *U.S. Balks on Easing Export Curbs*, N.Y. TIMES, Mar. 4, 1991, at D2.

435. *News Chronology*, CHEMICAL WEAPONS CONVENTION BULL., Sept. 1990, at 12.

436. See 56 Fed. Reg. 10760-01, 10756-01 (1991).

437. See 56 Fed. Reg. 10765-01 (1991).

438. Karen Riley, *Bush Tightens Export Controls*, WASH. TIMES, Mar. 8, 1991, at C1.

439. *Id.*

plication of our controls History shows that other people don't necessarily follow our leadership, and so they get the sales we don't make."⁴⁴⁰

2. Industry's Discomfort

Industry felt no more comfortable knowing that the Australia Group delayed the revised lists of chemicals and countries because members wanted to avoid naming Syria and Egypt as possible renegade chemical weapons producers because they had joined the coalition against Iraq.⁴⁴¹ The fact that the Departments of State and Commerce were at odds over the new rules engendered no industry confidence either.⁴⁴²

Nor did the memory of India's attempt to break free from the Australia Group's influence in 1989 assuage the uneasiness about accepting control guidelines from an informal group. India charged "colonialism" when members of the Australia Group tried to persuade India to cut off its supply of thionyl chloride—an ingredient of mustard—to the Iranians. India explicitly opposed the Paris Conference call for a total chemical weapons ban.⁴⁴³ Some warned that the Indian attitude "casts more doubt on the viability of the Australia [G]roup approach It's pretty clear that a lot of third world countries with developing chemical industries have no inclination to sign on."⁴⁴⁴

E. Multilateral Future

Though the Bush Administration employed efforts to move the Convention forward in 1989 and 1990, little progress actually took place. The atmosphere of approaching war with Iraq, a proven renegade from the Geneva Protocol of 1925, heightened world interest in the prospect of a global ban, but little change occurred at the negotiating table in Geneva. The surprising absence of chemical weapons from the field of battle seemed to provide the world with an excuse to again ignore this critical issue.

440. Farnsworth, *supra* note 434, at D2.

441. Stuart Auerbach, *U.S. to Curb Export of Ingredients in Chemical Weapons*, WASH. POST, Feb. 27, 1991, at G1.

442. Farnsworth, *supra* note 434, at D2.

443. Stephen Engelberg & Michael R. Gordon, *India Seen As Key on Chemical Arms*, N.Y. TIMES, July 10, 1989, at A1. India was an active participant in negotiations, however, and was an early signatory to the Convention.

444. *Id.*

The abortive effort to enact a global ban on chemical weapons use and production before the Gulf War did affect the United States, however. The effort stirred up the frustrations of Congress and highlighted the cross-purposes of three executive agencies. The net effect of President Bush's attempt to forge a global chemical weapons ban has been to burden the United States chemical industry so as to hamper its expansion into new world markets. As industries of the world scramble to exploit the radically changed political and economic climate created by the realignment of Eastern Europe, the United States chemical industry may be left behind to sort out the latest labyrinth of regulations now called "enhanced proliferation control."

The challenge for United States policy makers lies in conducting an export control system that will stay synchronized with shifting balances not only within the United States but in the global arena as well. An enforcement policy driven by disjointed and conflicting interests can be no policy.

V. UNILATERAL/MULTILATERAL REMEDIES

Experts on United States export policy recently reported that, "[u]nilateralism disadvantages the United States economy and can rarely be justified in a competitive world economy by security concerns."⁴⁴⁵ These experts comprised the Panel on the Future Design and Implementation of United States National Security Export Controls. However, it is also referred to as the Schmitt Panel and its output as the Schmitt Report.

Paradoxically, the Schmitt Panel reported to Congress. Congress is perhaps the only body flexible enough to protect the competitive interests of United States industry. This protection is achieved, however, only through the very unilateral action the Schmitt Panel so vigorously condemns.

The period in which chemical weapons commanded the world spotlight saw contradictory executive policy-making further complicated by congressional policy-making. During this time, a blue-ribbon panel of experts examined the quandaries raised by proliferation and export control. Commissioned by Congress in 1988, the Schmitt Panel struggled with export policy as it affected national security. Its deliberations took a sharp turn in mid-course because of radical

445. SCHMITT REPORT, *supra* note 433, at 167.

changes in the world geopolitical climate, especially in Eastern Europe.

A. *The Schmitt Report*

The committee reviewed the issues of proliferation in terms of nuclear capability, missile technology, and chemical weapons across the widest possible spectrum. It recommended sweeping changes in United States export policy. Many of the Schmitt Panel's general conclusions, however, have immediate and specific application to the problem of chemical weapons proliferation.

The Schmitt Panel outlined several interactive goals, examined the impact of unilateralism on industry, and encouraged efficiencies afforded by "red-side thinking" in the intelligence community.⁴⁴⁶ The Schmitt Panel soundly criticized the current organizational scheme for export control.⁴⁴⁷ Among the Schmitt Panel's criticisms were the lack of sufficient judicial review and half-hearted participation by industry.⁴⁴⁸ Of all the shortcomings found, however, unilateralism received the greatest share of disapproval. Paradoxically, the Schmitt Panel thereafter concluded that a single agency could better manage United States export policy. A National Security Directive would be its only source of authority. This agency would harmonize control lists and ensure industry participation.⁴⁴⁹ The following sections will describe the findings of the Schmitt Panel, examine the shortcomings of those findings and offer an alternative plan.

1. Interactive Goals

Six of the nine "interactive goals" established for future adaptation and modification of export policy bear directly on the problem of chemical weapons proliferation:

[a.] Preventing or retarding the proliferation of items that could directly and immediately enhance the conventional or strategic capabilities of countries that may now or in the future pose a threat to the physical security or vital interests of the U.S. and other nations that share common objectives.

[b.] Preventing or retarding the proliferation of items for use in

446. *Id.* at 168.

447. *Id.* at 172. Their criticisms included overlapping enforcement, confusing control lists, and ineffective inter-agency dispute resolution. *Id.*

448. *Id.*

449. *Id.* at 167.

acts of terrorism or other political violence against the interests of the U.S. and other nations that share common objectives.

[c.] Preventing or retarding the proliferation of items that may be destabilizing to global or regional political structures and power alignments.

[d.] Avoiding negative impacts on economic competitiveness and the overall viability of the free market economies that participate in global trade.

[e.] Maintaining harmony with U.S. allies and cooperating countries in the administration of export control measures.

[f.] Improving the structure and administration of export controls to increase efficiency and lessen adverse effects in the private sector.⁴⁵⁰

Upon this broad base, the Schmitt Panel built its recommendations for reform in United States export policy. The Schmitt Panel's bias was clearly disclosed in its hard-line on unilateralism, a term which can be translated as "interference by Congress."⁴⁵¹

2. Unilateralism's Impact on Industry

Stating that "[u]nilateralism disadvantages the United States economy," the Schmitt Panel faulted the ease by which United States export controls could be modified by unilateral action.⁴⁵² The Schmitt Panel asserted categorically that the unilateral quality of export control action engendered the worries of United States industry. When restrictions and control practices are not implemented simultaneously by United States allies and, in particular, by members of the Coordinating Committee for Multilateral Export Controls ("CoCom"), United States industry rightfully perceives itself carrying the burden of export policy.⁴⁵³

The Schmitt Panel listed those unilateral features of current United States export policy which were most offensive to industry:

[a.] controls on reexports of U.S. items to third countries and the requirement for written assurances regarding end use and reexport;

[b.] controls on U.S.-owned foreign entities;

[c.] controls on foreign products that use (or are made with) technologies of U.S. origin;

450. *Id.* at 166.

451. *Id.*

452. *Id.*

453. *Id.* at 167.

- [d.] controls on foreign products that have U.S.-origin components in them;
- [e.] control of some items as munitions that other CoCom nations regulate less restrictively as dual use products;
- [f.] selective imposition of unilateral product and technology controls;
- [g.] more burdensome and complex licensing regimes; and
- [h.] more stringent enforcement mechanisms.⁴⁵⁴

The panel recommended that the United States eliminate unilateral features of export policy across the board, "except in those rare instances in which such unilateral action" might accomplish a short term objective.⁴⁵⁵

3. "Red-Side" Thinking's Efficiencies

The changed relationship of the United States and its allies to the former Soviets and their allies represented the focus of the Schmitt Report. Under this rubric, the Schmitt Panel found that export policy could not prevent espionage and that "diversion practices" continued to undercut the goals of United States export policy.⁴⁵⁶ Though the Schmitt Panel did not analyze the impact of espionage and diversion practices regarding chemical weapons specifically, the same conclusion concerning more common materials and technology easily follows.⁴⁵⁷

In its analysis of the intelligence community, the Schmitt Panel discussed how "red-side" thinking altered the United States focus on Soviet activities.⁴⁵⁸ "Red-side" thinking sets aside the idea that the Soviets possessed the identical technological skill and goals as did the United States and her allies.⁴⁵⁹ By reformulating the United States' perception of Soviet goals, the United States could devise a more specific regime of export control, thus reducing over-control.

"Renegade-side" thinking about the chemical weapons goals of a nation might prevent a similar sort of overkill. For example, if a renegade nation's only enemy-nation is highly sophisticated, the likelihood of chemical weapons use in battle might diminish. But if the enemy is a group of unsophisticated people isolated from the rest of

454. *Id.*

455. *Id.*

456. *Id.*

457. Nations such as Iraq, Libya, Syria, and Iran exemplify this concern. *Id.*

458. *Id.* at 168.

459. *Id.*

the civilized world, the likelihood of chemical weapons use might increase. Therefore, it might be more important to watch the flow of materials and technology where they are more likely to be used against an unprepared civilian population.

4. Schmitt Report Criticisms of the Status Quo

The Schmitt Panel found six major flaws in the current organizational framework for export control. The following sections detail those flaws.

a. The Organizational Scheme

The Schmitt Panel found that more than “a dozen agencies, plus the military services,” exert various degrees of control over United States export policy.⁴⁶⁰ The Schmitt Panel also found multiple statutes governing those agencies. The result is a plethora of overlapping and conflicting regulations. The agencies that are supposed to lead United States export policy and implementation—the Departments of Commerce, State and Defense—“are often unable to integrate the various national security, economic, and foreign policy issues.”⁴⁶¹ The dearth of balanced, coherent views on key issues, therefore, is no surprise.

b. Overlapping Enforcement

Within the United States, the Customs Service and the Commerce Department’s Office of Export Enforcement often find themselves “working the same case without each other’s knowledge.”⁴⁶² The Schmitt Panel found fault with the differing sanctions from statute to statute and with attempts to control behavior beyond the United States’ jurisdiction.⁴⁶³ The Schmitt Panel recommended bringing all export control authority within a single agency.⁴⁶⁴

c. Confusing Control Lists

The panel criticized list management because definitions necessary for control and decontrol are difficult to perfect. As a result, export lists do not reflect multilateral decision making. The panel

460. *Id.* at 171.

461. *Id.* at 172.

462. *Id.*

463. *Id.*

464. *Id.* at 191.

went so far as to assert that “foreign nations and suppliers—not the United States interagency process—are driving the [domestic] export control apparatus” because the President has been forced to work around the system.⁴⁶⁵ The Schmitt Panel recommended that the United States consolidate all controlled commodities and technologies into a single list with a single set of sanctions.⁴⁶⁶

d. Ineffective Inter-Agency Dispute Resolution

Without clear policy guidelines and straight forward agency responsibilities, disputes among the controlling agencies are inevitable.⁴⁶⁷ What is not inevitable is the reasonable resolution of those disputes. The Schmitt Panel echoed the criticisms heard in 1989 Senate hearings that agencies do not communicate adequately. As long as multiple agencies exert control over list construction and enforcement, inter-agency disputes will continue to burden the system to the detriment of industry.

e. Insufficient Judicial Review

Admitting that “judicial review is no cure-all,” the Schmitt Panel suggested allowing the courts to “correct agency abuses.”⁴⁶⁸ The Schmitt Panel relied on the doubtful efficacy of judicial review of administration action because it advocated removing congressional influence. If the executive branch controls export policy exclusively, some check on discretion will be necessary. Unfortunately, judicial review of administrative rule-making does not have the track-record to instill confidence in its ability to do the job.

f. Half-Hearted Industry Participation

The Schmitt Panel found that “the traditional policy process does not lend itself to effective and fair presentation of industry views.”⁴⁶⁹ Admitting that half the problem was the fault of an apathetic industry, however, it admonished United States industry to take a greater interest.⁴⁷⁰

465. *Id.* at 172.

466. *Id.* at 192.

467. *Id.* at 173.

468. *Id.*

469. *Id.* at 174.

470. *Id.*

5. Schmitt Panel Views Unilateralism as the Key Flaw

The cardinal sin of unilaterally imposed export controls is the requirement for non-United States parties to secure permission for the re-export of goods or technology. This attempt to control what foreign buyers do with United States products after the sale rankles United States industry more than any single policy. “[A]necdotal evidence [suggests] foreign manufacturers avoid United States sources in order to escape the encumbrance of United States export controls.”⁴⁷¹

If the perception that such congressional control automatically imposes a heavier burden on United States industry could be overcome, the necessity to exclude Congress from the export control arena may also diminish. But thrusting the entire export control policy into the hands of the executive branch may actually work against one of the Schmitt Panel’s most important objectives: to remove export policy from the arsenal that the United States uses to enforce foreign policy objectives.

6. The Schmitt Report Plan for Change

The plan that the Schmitt Panel offered to correct the flaws in the United States export policy scheme has four key elements. These elements are discussed in the following sections.

a. A Single Agency

A single agency should maintain exclusive control over export policy and its implementation. “[A] single agency [should have] final authority to make decisions on routine licenses, to promulgate regulations, and to resolve interpretive disputes with specific policy guidelines.”⁴⁷² While the endorsement of a single agency represents a bold move, courage failed the Schmitt Panel when it sought a location for the agency. Asserting that working within the present system was easier than making dramatic changes, it singled out the Commerce Department’s Bureau of Export Administration. The Schmitt Panel overlooked the Bush Administration’s inclination to shift power away from the Commerce Department and into the Department of State.⁴⁷³ A single agency answers the problems of overlapping jurisdiction and

471. *Id.* at 173.

472. *Id.* at 191.

473. This is evidenced by the “Enhanced Anti-Proliferation Rules” promulgated in 1991 over the vigorous objection of the chemical industry and its principal advocate in the Bush Administration, the Department of Commerce. *Id.*

contradictory enforcement, but the Schmitt Panel failed to follow through on the recommendation to produce a solution that would have overcome the greatest number of deficiencies in United States export control.

b. National Security Directive as Authority Source

The Schmitt Panel's anti-congressional bias appears most graphically when it selects the source of the single agency's authority. The single agency would derive its authority exclusively from a National Security Directive and not through amendment to the EAA. The directive would outline the process of implementing the executive's policy.

Under the Schmitt Panel's plan, the President would devise the objectives of national security export control and provide the direction for achieving those goals. The plan also suggests the establishment of an Export Control Policy Coordinating Committee, along with national security export control interagency groups, to provide advice as guidelines develop under the National Security Directive. The principal policy change that the Schmitt Panel envisions is the substitution of "economic security" for foreign policy goals. Yet, historically the President has been the source of the increasing emphasis on export control as a tool for foreign policy objectives.

c. Harmonized Control Lists

Because the Schmitt Panel insisted on working within the current structure, it could not recommend a dramatic revamping of the export control lists. Rather, the panel called for a "set of integrated United States control lists . . . similarly structured and formatted."⁴⁷⁴ Greater simplicity, the Schmitt Panel rightly argues, means greater "transparency," thus making industry cooperation easier. The Schmitt Panel, however, only recommended that "[a]n interagency task group should regularly review the Munitions and Commodity Control Lists to eliminate duplication and ensure coordination with the CoCom Industrial List."⁴⁷⁵ Likewise, it suggested some coordination of dual use lists with other multilateral control arrangements, such as the Australia Group.

474. *Id.* at 192.

475. *Id.*

d. Industry Participation

The strongest recommendation made by the Schmitt Panel envisioned greater industry participation in the export control regime. The Schmitt Panel presented an elaborate organizational scheme for a committee of industry advisors that would "ensure continuity from administration to administration."⁴⁷⁶ Moreover, it recommended enhancing technical advisory committees to ensure the highest level of expertise and responsiveness.

B. Short-sightedness of the Schmitt Report

Perhaps curiously for a committee created in response to a congressional call for a comprehensive study of United States export administration, the Schmitt Report recommended that, in the name of efficiency, the executive branch should undertake formulation of both export policy and the structure for its administration. The Schmitt Report called for promulgation of a new policy and a new machinery through the vehicle of a national security directive.

The Schmitt Report recommended, in addition, that the national security directive concentrate the day-to-day administration of export controls in a single agency, the Bureau of Export Administration, within the Commerce Department. All three of these recommendations reflect a coherent, if not necessarily compelling, view of United States government. Whatever the benefits from other forms of exports, these three recommendations offer no special advantage in shrinking either the global market for, or United States exports of, chemical weapons precursors and associated technology.

1. Efficiency as Sole Criterion

The Schmitt Report presumed that efficiency should be the sole criterion for judging export policy and its administration. Such a view fails to account for the fundamental presumption enshrined in the Constitution that separation of powers among governmental branches safeguards values more important than efficiency. The Schmitt Report echoes previous calls to streamline regulatory government by vesting greater control and discretion in the chief executive. Influential among these has been the 1971 report of the President's Advisory Council on Executive Organization.⁴⁷⁷

476. *Id.* at 194-95.

477. PRESIDENT'S ADVISORY COUNCIL ON EXECUTIVE ORGANIZATION, A NEW REGU-

The underlying blueprint for national government says nothing about making policy; it speaks only of making and carrying out laws. When the Constitution mentions lawmaking, it confers such power, in most instances, to the Congress and the President acting jointly. Tradition dictates that presidents approach Congress, thus honoring the difference between proposing and making law.

The proper scope of lawmaking by national security directive should reflect both constitutional presumption and inter-branch tradition. While the President is clearly expected to play a leading role in the conduct of our nation's diplomatic and military affairs, the Congress possesses the power to regulate international trade. At best, advocates for a greater presidential role in export policy-making should argue for a greater presidential voice in the constitutionally designed joint endeavor, not for the exclusion of the congressional voice.

A national security directive should not be a device to circumvent joint law-making in formulating policies as substantial as export regulation. The national security directive is not an appropriate substitute for legislation on international trade. So the authorization by statute of some presidential actions is not properly read as authorization for action of the proportions apparently contemplated by the Schmitt Report. The passage of the Chemical and Biological Weapons Control and Warfare Elimination Act of 1990 proves that conflict of competing constituent interests in the Congress does not foreclose coherent action on issues as multi-faceted as chemical weapons proliferation. The legislation's subsequent veto proves that the discipline of hierarchical organization in the executive branch does not necessarily enable coherent and uncompromised policy on such issues.

2. Executive Abhorrence to Single Agency Control

When the Schmitt Report recommended consolidating day-to-day administration of export controls in a single bureau of the Commerce Department, it flew in the face of the last twenty years of administrative experience. The history of federal administrative systems related to air travel and nuclear energy, for example, offers compelling evidence that placing both promotional and regulatory responsibilities in the same government office creates a conflict of bureaucratic

interest that discourages aggressive enforcement of safety standards in favor of industry accommodation.

The Federal Aviation Act of 1958, for example, abolished the old Civil Aeronautics Administration,⁴⁷⁸ and transferred the task of ensuring safety in domestic civil aviation to a new, independent Federal Aviation Administration. Congress also responded to criticism that the Atomic Energy Commission ("AEC") operated under a continuing conflict of interest as both the promotor and regulator of nuclear power. It divided the AEC's two primary duties between separate agencies: the Energy Research and Development Administration⁴⁷⁹ and the Nuclear Regulatory Commission.⁴⁸⁰

If, as the Congress clearly believes, the proliferation of chemical weapons threatens United States security interests, then administration of curbs on proliferation by export should not be assigned to a bureau under the department established to foster commerce. For an effective program of export control Congress should establish offices responsible for both policy design and implementation that are independent of existing bureaucracies.

The Schmitt Report recognized the need for a clearing-house of competing interests at the policy level, but failed to recognize its appropriate location in the legislative branch. The Schmitt Report failed to see the equivalent need for a clearing-house of competing interests at the administrative level, since it proposed consolidation of administration into a bureau of the Commerce Department.

3. Means or Goals in Control?

Each of the three Schmitt Panel recommendations stems more from dissatisfaction with the balance of power between political branches than from the necessities of effective export control. This observation is even more compelling if it is limited to just the impact of the Schmitt Panel recommendations on chemical weapons precursor and technology proliferation. The concentration of power in the

478. The Civil Aeronautics Administration, along with the Civil Aeronautics Board which developed and promoted industry, was located within the Department of Commerce. Federal Aviation Act of 1958, Pub. L. No. 85-726, 72 Stat. 731 (1958).

479. The Energy Research and Development Administration is responsible for the promotion and support of civilian use of nuclear power. Act of October 11, 1974, Pub. L. No. 93-438, 88 Stat. 1237 (codified at 42 U.S.C. § 5814 (1988)).

480. The Nuclear Regulatory Commission is responsible for the safety regulation of reactor construction and operation. Act of October 11, 1974, Pub. L. No. 93-438, 88 Stat. 1237 (codified at 42 U.S.C. § 5814 (1988)).

hands of an executive branch willing to re-analyze congressional assessments of the competing costs versus other diplomatic objectives, the domestic economy, and national security would affect a significant shift in the balance of power between the White House and Capitol Hill.

C. Unilateralism Is the Core Problem

The chemical industry's aversion to unilateral national controls on international trade in chemical weapons precursors and technology also contradicts the industry's apparent endorsement of the worldwide elimination of such weapons. If the industry does not sell in the military market, then it has little to lose from unilateral sanctions intended to punish the renegade producer or broker.

1. Industry's Objections

Much of the industry's objection to unilateral controls centers on controls applicable to resale. Producers object to the United States' efforts to prevent foreign buyers from reselling precursors or technology to third parties interested in weapons development. Producers claim that foreign customers avoid United States sources in order to avoid burdensome resale restrictions. If those foreign customers intended to resell weapons to third parties at the outset, then the sale was one which United States producers have already foresworn in the absence of a middleman.

The industry's forbearance from direct sales for military use seems hypocritical if, at the same time, it demands freedom to make unrestricted sales to brokers intending the same final use. An objection to effective restrictions on resale because they restrict United States producers in a market where foreign producers remain free is only a variation on the industry's old position that it should be able to sell directly abroad for military use because others do.

If the industry is not complaining about the discouragement of buyers anticipating future resale for military use, then the industry must be objecting to the discouragement of buyers anticipating resale for legitimate reasons. United States restrictions intended to deter military resale might well impact the other if the buyer's subsequent task of satisfying United States authorities is foreseen by the potential buyer as too costly. It might well be that brokers, or even consumers who sometimes trade inventory, would abandon the United States

market for one in which the same chemicals at the same price are available without resale restriction.

2. Industry Objections Shortsighted

The United States chemical industry is complaining about United States restrictions that prevent the United States producer from competing with itself for the resale. Parallel end-user certifications have served conventional arms manufacturers very well. For example, Colt, a firearms manufacturer, has relied heavily on resale restrictions created by both contract and treaty to prevent buyers of its military rifle manufacturing process from offering the product to other countries in competition with Colt's product. Restrictions on resale may drive some customers to other sources. But they also protect United States producers from having to discount their products because a competitor offers legitimate buyers the same product at sale prices.

C. *The Schmitt Panel Criteria for Change*

The central goal of the Schmitt Panel's recommendations lies in using multilateral sanctions to constrain access to technologies and materials by countries that might use chemical weapons. The Schmitt Panel, it must be remembered, examined all aspects of United States export policy, including nuclear, biological, and missile technology with its principal emphasis on the changed relationship between the United States and the former Soviet bloc. However, the Schmitt Panel's general recommendations on the broader problem of proliferation apply to the narrower issue of chemical weapons proliferation.

Though the Schmitt Panel conceded that "export controls are not universally effective in slowing proliferation," they are better than unilateral controls.⁴⁸¹ The Schmitt Panel stated:

Control regimes must be tailored to the particular circumstances of specific proliferation threats and, to be effective, must be as fully multilateral. . . involv[ing] the maximum number of suppliers [Export controls] should be targeted *only* on those technologies or products *directly essential* to the development and/or manufacture of [chemical] weapons.⁴⁸²

Arguing that modifying the current system is likely to be more

481. SCHMITT REPORT, *supra* note 433, at 184.

482. *Id.* at 182.

effective than starting anew, the Schmitt Panel set out criteria for evaluating their plan:

- [1.] Policy issues [must be] resolved in a timely manner and policy decisions [must be] enforced by the executing agency.
- [2.] View of relevant departments [must be] heard and considered, and resolved cases presenting significant policy issues [must be] taken to a senior-level inter-agency group for prompt resolution.
- [3.] The system [must be] made simpler, more open, and internally consistent so that policymakers, administrators and United States and foreign business can more easily understand it and work with it.
- [4.] The development of export control policy [must be] well balanced, and industry and other affected parties [must] have appropriate opportunities for input into policy formulation, including regulatory changes and list development.⁴⁸³

These four criteria represent an excellent test of a revised export policy control regime.

D. A Proposed Alternative Plan

The Schmitt Panel discussed the heart of the export control policy problem. Their report illustrates the deficiencies in United States policy. The Schmitt Panel's assessment of the problem and some of its recommendations are excellent. However, the Schmitt Panel did not go far enough. The following suggested changes would better serve the goals set out by the Schmitt Panel.

1. A Single Agency

Export control must be brought under the auspices of a single agency. The agency should be neither exclusively influenced by the executive nor the legislative branch. In order to meet the Schmitt Panel's overall objective of tailoring "the particular circumstances to specific proliferation threats," the agency must be free of political tinkering for the purposes of advancing foreign policy by the President and domestic interests by the Congress.

Industry and technical groups must advise the single agency. That agency should harmonize the goals of the executive agencies—Commerce, State and Defense—which traditionally influence export policy. But that agency must remain independent. Such independence is only possible if Congress through its legislative power, not

483. *Id.* at 178-79.

the President through the National Security Directive power, provides the enabling authority for this independent agency. That enabling authority must possess at least a ten year life-span before congressional renewal in order to reduce political "tinkering."

Following the example of the organization of the Federal Reserve Board, the President should appoint a director and a board whose terms would overlap administrations. All board members should be confirmed by the Senate. Sitting *ex-officio* on this board would be an Under-Secretary of State, Commerce, and Defense, as well as a representative of the United States Customs office to serve as the enforcement arm of this new agency.

2. A Single List

If economic security takes precedence over foreign policy as the primary objective of export policy, then list-making must return to the historical assumption that all commodities are candidates for unrestricted trade to any destination. In other words, the United States should scrap all the previous lists—Munitions, Commodity Control, dual use, and restricted destinations. A single, simplified list should then be reconstructed with no item or destination revived unless it passed muster under a set of concrete criteria for inclusion. The assumption must be that the entire list is temporary, thus fulfilling the Schmitt Panel's goal of targeting only those technologies and products directly essential to the development and manufacture of weapons.

Items and technologies with clear military applications would certainly be revived from the Munitions List but without the vague "including but not limited to" categories. Specific destinations involving nations which present clear threats to the security of the United States, its allies, or vulnerable nations and peoples would also be revived from the collection of lists presently in place. The list of commodities and technologies having both commercial applications and the potential for chemical weapons development—or any other weapons development potential within the larger scope of export control reform—would be reconstructed with guidelines developed from calculations made with "renegade-side" thinking, a variation of current "red-side" thinking. Thus, the single list will advance the Schmitt Panel's goal of making the entire system more simple, open, and internally consistent.

3. Single Set of Monetary Sanctions

With a single list must come a single set of sanctions, and a single process for adjudication entirely within the federal system of civil justice beginning with an administrative proceeding and advancing to federal district court upon appeal. Criminal penalties would be reserved exclusively for cases of fraud and conspiracy to commit fraud.

Sanctions would be exclusively monetary with no threat of losing export privileges. The monetary sanctions, however, would be significant, ranging from \$100 thousand for minor infractions to \$10 million for serious breaches. Parent corporations would only assume liability for the actions of their subsidiaries if the offending subsidiary is unable to pay a levied penalty.

4. Quick Response Guidelines

The primary charge of the new agency should lie in developing—under the informal rule making procedures of the Administrative Procedure Act⁴⁸⁴—a set of guidelines that will allow commodities and destinations to be *removed* from the agency's jurisdiction as quickly as they are included. A swift response to changing geopolitical climates would provide a measure of flexibility that the Bush Administration insisted the executive branch must maintain. A quick response would also reassure industry that it will not be encumbered with export control. A quick response would, finally, foster the multilateral cooperativeness of other countries.

5. System of Incentives

Sanctions enforce restrictions but do little to encourage the sort of domestic and international cooperation necessary to discourage the proliferation of chemical weapons. Incentives represent the better course.

a. Incentives to Governments

For friendly governments, the United States should provide economic incentives from its collection of foreign assistance programs. However, for Third World countries not participating in the Convention, the United States and other participants should devise a program to encourage nations to destroy their stockpiles of chemical weapons in an environmentally safe manner.

484. 5 U.S.C. §§ 551-706 (1988).

Nonetheless, the single most significant deterrent to chemical weapons use is the gas mask and protective clothing. The United States and the Conference participants should launch, through the United Nations, a worldwide program to make protective gear and information readily available, not only for military, but for civilian use.

b. Incentives to Industry

A nagging problem of chemical weapons proliferation is the existence of an unregulated market for precursor chemicals and technology outside of the government-to-government market. Industry is the principal supplier. To short-circuit the intensity of supply and demand economics, industry must receive greater incentives to discourage proliferation than to sell to renegade buyers. In short, participation in an antiproliferation regime must be made profitable enough to guarantee industry's long term cooperation.

1. Incentives to Clean Up

Just as oil well fire fighting companies arrived in Kuwait following the Gulf War to exploit the urgent need to extinguish fires set by the retreating Iraqis, chemical disposal teams will have plenty of work helping the Iraqis destroy their stockpiles of mustard, Tabun, and Sarin safely. Moreover, the United States should encourage the chemical industry to develop methods by which countries can dispose of their stockpiles now that the Convention is ratified. For example, Lockheed, Olin and Babcock & Wilcox apparently see a lucrative market. Newly incorporated as International Disarmament Corporation, they submitted a proposal to the Defense Nuclear Agency in hopes of capturing some \$400 million appropriated by Congress for the destruction of nuclear and chemical weapons in the former Soviet Union.⁴⁸⁵

In addition, as Third World countries decide to take advantage of the incentives to destroy their stockpiles, the need for environmentally safe procedures will grow. The United States should create tax incentives and government grants to encourage the chemical industry to develop those procedures and reap the global profits.

485. *News Chronology*, CHEMICAL WEAPONS CONVENTION BULL., Mar. 1992, at 16.

2. Environmental Clean-Up

In tandem with chemical demilitarization development, there should be an emphasis on general environmental clean up. Besides the need to clean up the post-war debris in Kuwait and Iraq, there is a generation's worth of environmental clean up waiting for attention in Eastern Europe. The United States could direct much of the chemical industry's energy into an environmental "Marshallization" of nations newly entering the free world. It could compel the governments of those countries to bring in modern technology for the purpose of cleaning up ecological toxins left by former communist regimes.

3. Convention Verification

The chemical industry has already demonstrated its ability to provide direction to the Convention deliberations with its willingness to embrace verification. The chemical industry in the United States overcame its reticence about surprise searches of facilities and demonstrated that the major stumbling block to an efficient and fair global chemical weapons ban was not impossible to remove.

E. Prospects for the Immediate Future

Negotiations at the Convention suddenly became energized in the summer of 1992. By September 1992, the Convention submitted the final draft to the 47th Session of the United Nations General Assembly. At the formal signing in Paris in January 1993, then Secretary of State Lawrence Eagleburger declared:

We have seen the international community liberate itself from half a century of gridlock and paralysis and move beyond the rhetoric of democracy to achieve real democracy; move beyond the rhetoric of disarmament and achieve real reductions in weapons of mass destruction.⁴⁸⁶

Within days of the Convention's opening in January 1993, 137 nations became signatories. This immediately triggered formal activation of the treaty, which only required 65 signatories.⁴⁸⁷

The final hours of negotiations were not without some snags, however. In a monograph released by The Committee for National Security on July 29, 1992, Brad Roberts, a Research Fellow at the

486. *Chemical Weapons Convention Signing Ceremony*, STATE DEP'T BULL., Jan. 18, 1993 (statement of Sec. Eagleburger).

487. Alan Riding, *Signing of Chemical Arms Pact Begins*, N.Y. TIMES, Jan. 14, 1993, at A16.

Center for Strategic and International Studies, painted a cautiously optimistic picture of the Convention negotiations during 1991.⁴⁸⁸ In Geneva, Roberts interviewed the negotiators, including those representing the new Eastern Bloc nations.

Surprisingly, in the closing hours of negotiations, the issue of challenge inspection did not maintain its historical priority.⁴⁸⁹ Rather, differences emerged between the Western group and G-21 over the continuing role of the Australia Group, which had grown to 22 nations.⁴⁹⁰ "G-21 viewed this as a form of double jeopardy," because they believed "that either states should be subject to one set of rules or another but not two sets at the same time."⁴⁹¹

A third issue to emerge was whether non-lethal agents should be included within the Convention ban. Germany, the current chair of the Chemical Arms Control group, favored inclusion stating, "the U.S. position is firmly that they ought not be [included]."⁴⁹²

Less amenable to compromise was the fourth problem of old and abandoned stocks. China complained that vast quantities of undeposited chemical agents,⁴⁹³ were left behind by the Japanese during World War II. Disposing of these old and abandoned stocks would "consume money that China does not feel that it has."⁴⁹⁴ A deal between China and Japan for disposal might be "overly optimistic."⁴⁹⁵

The fifth technical problem was a familiar one. The G-21 and the Western voting bloc had different ideas about the structure of the Executive Council. "Everybody wants to craft the voting rules such that they have an ability to block votes and actions by the Council deemed unacceptable to them, whether with a blocking majority or a minority veto."⁴⁹⁶ The negotiators are:

[N]early unanimous in the view that the time is now or never for the conclusion of the Convention. Either there will be agreement within the July-August time frame, or the odds for agreement will begin to decline and the likelihood for agreement will begin to slip

488. BRAD ROBERTS, A STATUS REPORT ON THE CHEMICAL WEAPONS CONVENTION NEGOTIATIONS 7 (1992).

489. *Id.* at 1.

490. As this Article went to press, the Australia Group had officially grown to 24 members. *See id.*

491. *Id.* at 2.

492. *Id.*

493. *Id.*

494. *Id.* at 3.

495. *Id.*

496. *Id.*

away relatively quickly.⁴⁹⁷

Among the Western group, there was "the slightest hint of feeling that the importance of [the Convention] is waning [T]his was a Cold War-era priority."⁴⁹⁸ If agreement could not be reached by 1993, many countries threatened to pull their most talented negotiators away from Geneva and to dispatch them to other problems which were "more pressing."⁴⁹⁹

Even President Bush's dramatic gesture in May 1991, declaring that the United States would destroy *all* its chemical weapons in ten years did not seem to give the negotiating states the will to press forward to a final agreement. Reinforcements from the United States chemical industry coupled with incentives from other nations that serve as home bases for multinational chemical corporations provided the missing impetus. Even the Chemical Manufacturers Association wanted a swift "ironclad ban on chemical weapons—now and for all time."⁵⁰⁰

E. Conclusion

The urgency to change United States export policy may have dissipated with the quick end to the war for Kuwait. The Chemical Weapons Convention is now an accomplished fact with only the vagaries of implementation left. Anti-proliferation legislation passed the Senate quickly in the closing hours of the Persian Gulf war. But it now languishes in anticipation of a rerun of the conference committee in 1990 and another potential slugfest over whether Congress can force the President to impose sanctions on foreign contributors. In the meantime, the executive administrators control a vast portion of United States export policy, including chemical weapons proliferation measures, tipping the balance of influence within the executive branch away from the industry-sensitive Commerce Department and toward the Department of State, whose interests are focused beyond the economic realities faced by the chemical industry, though no one is sure how the "changing of the guard" to the new Democratic administration will affect the situation.

The United Nations Commission inspecting Iraqi weapons has announced finding 50 thousand pieces of filled munitions, including

497. *Id.* at 5.

498. *Id.* at 6.

499. *Id.*

500. *News Chronology*, CHEMICAL WEAPONS CONVENTION BULL., June 1992, at 21.

rockets, bombs and artillery shells, 75 SCUD missile warheads designed for chemical weapons use, and as many as 75 thousand pieces of unfilled munitions designed for chemical weapons use. Iraq has declared between 10 thousand and 15 thousand such munitions but the United Nations discovered so many more, actually filled with mustard and nerve gas, that the most critical problem now is how to safely dispose of them.⁵⁰¹

At the same time, ideal conditions for deployment of the vast stores of chemical weapons no longer in the undisputed and exclusive possession of the former Soviet Union are materializing in pockets of ethnic hostility around the world. In April 1992, reports from the Azerbaijani Defense Ministry in Nagorno-Karabakh alleged that Armenians fired a 120mm shell filled with "substances from the cyanide group."⁵⁰² In the same month, reports from the Yugoslav People's Army alleged that an unknown poison gas was used by Croatian forces south of Stolac in Bosnia-Herzegovina.⁵⁰³ In May 1992, Health Minister Farhad Dzhaferuliyev of the Nakhichevan Autonomous Republic, insisted on the basis of blood specimens taken from casualties that Armenian bombardment of the border town of Sadarak included both cyanide and mustard gas.⁵⁰⁴

As new locales for suspicion emerge, the old hot spots refuse to be smothered. Then Central Intelligence Agency Director Robert Gates told the House Armed Services Committee in March 1992, that even though Iraq had surrendered vast quantities of chemical weapon stockpiles, "we believe the regime still has more of everything—more precursor chemicals, more bulk agent, more munitions, more production equipment."⁵⁰⁵

At the opening of the Chemical Weapons Convention on January

501. Rolf Ekeus, *Chemical Weapons and the New Global Security Structures*, CHEMICAL WEAPONS CONVENTION BULL., June 1992, at 2.

502. *News Chronology*, CHEMICAL WEAPONS CONVENTION BULL., June 1992, at 19. A workshop organized by the Swedish government in December 1992, examined all of the reported uses of chemical weapons, including the recent report from Azerbaijan; "[a]fter examining alleged victims, interviewing alleged witnesses, inspecting alleged munitions and fragments and reviewing Aseri chemical analytical procedures, the team concluded that it had found no evidence of [chemical weapons]." *Investigating Alleged Uses of Chemical Weapons*, CHEMICAL WEAPONS CONVENTION BULL., Dec. 1992, at 22. The same workshop announced that "definitive evidence of the use of chemical weapons other than riot-control agents was obtained only in the case of the 1984-88 UN investigations in Iran and Iraq." *Id.*

503. *News Chronology*, CHEMICAL WEAPONS CONVENTION BULL., June 1992, at 19.

504. *Id.* at 22.

505. *Id.* at 15.

13, 1993, just one week before leaving office, President George Bush released the following statement:

For more than 20 years, the United States and many other countries have labored to achieve a ban on chemical weapons. The long-awaited Chemical Weapons Convention is now completed and open for signature

The Chemical Weapons Convention is uniquely important in the field of arms control agreements. It will improve the security of all nations by eliminating a class of weapons of mass destruction that exist in all quarters of the world and that has been used in recent conflicts. It is a truly stabilizing and non-discriminatory agreement

Much work remains to make the Convention fully effective. The United States will cooperate closely with other countries to bring the Convention into force as soon as possible and to ensure that it is faithfully implemented. Only then will we be able to say that the risk of chemical warfare is no longer a threat to people anywhere in the world.⁵⁰⁶

Hardly one month later, the specter of chemical weapons use reappeared. On February 18, 1993, a representative from the Department of State announced that Libya was back in the chemical weapons production business on a large scale.⁵⁰⁷ Unnamed intelligence sources in the United States claimed that Libya was building an underground plant near Tarhunah, forty miles southeast of Tripoli, disguising it as a water project.⁵⁰⁸ "We invite any neutral international body and international media to visit the area," announced the Libyan Foreign Ministry.⁵⁰⁹ "And we make this invitation to the Democrats so they do not make the same errors as the previous administration," the Libyan communique declared.⁵¹⁰ Those who have followed the complex web of political paradoxes of chemical weapons proliferation cannot help but wonder if the the struggle to eradicate these weapons has not come full circle.

506. *U.S. Signs Chemical Weapons Convention*, STATE DEP'T BULL., Jan. 18, 1993.

507. Douglas Jehl, *U.S. Says Libya is Building 2d Poison-Gas Plant*, N.Y. TIMES, Feb. 18, 1993, at A7

508. *Id.*

509. *Libya Says U.S. Can Visit Alleged Chemical Plant*, REUTER LIB. REP., Feb. 20, 1993.

510. *Id.* See also *Libya Denies Building Chemical Arms Plant*, CHI. TRIB., Feb. 21, 1993, at 26.