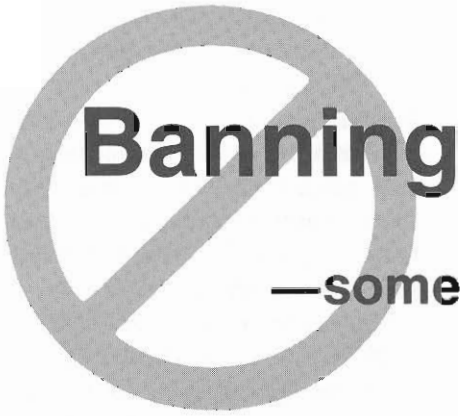

Banning Chemical Weapons

—some questions to be considered

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It's cold and damp. The dew still lies upon the field and there is the ever-present water in the trenches. February 15, 1915, is going to be a day just like every other day of the past two weeks. The Belgian front is a desolate place to be. The thought of charging the Germans in their trenches a thousand meters to the front is not a pleasing one. There will be the normal artillery prep, in about 30 minutes, prior to the charge.

We still have time for one last smoke before we make final checks and begin. Upwind, off to the left, someone is coughing. The sergeant will take care of him quickly enough. All along the trench more men seem to be coughing and becoming restless. Our eyes and throats are burning from something in the air. Farther up the line, some of the men are running from the trench. It's getting harder to breathe and the burning is almost unbearable. Most of us are running from the trenches, trying to escape and find fresh air.

Those who didn't (or couldn't) get away stayed in those trenches forever. The use of "modern" chemical warfare during World War I, first with the use of chlorine, then phosgene, and yperite caught the world unprepared for this type of warfare. Even the Germans, who used chemicals first, were not prepared for the dramatic effect that it would have.

Later, those chemical warfare (CW) agents were mixed with other substances to maximize their effeciveness or to try out new compounds. The fledgling chemical industry of the early 1900s quickly learned to adapt known compounds such as insecticides or pesticides for other uses and to develop more toxic gases and substances to retaliate with.

Use of these "inhumane" weapons brought an almost immediate response by the free world. Attempts were made to insure that these weapons would never again be used. Soon after WWI the United States drafted the Washington Treaty of 1922, which outlawed the use of lethal poisonous gases and similar substances in war (except in retaliation), but it did not go into effect because it was not ratified by France. Shortly thereafter, during the Geneva Convention, the "Geneva Protocol" of 1925 was adopted and ratified by most of the world powers. Although the United States abided by the terms of the protocol, it was not ratified by the US Senate until 1975.

The Geneva Protocol, intended to eradicate the use of chemical weapons, seems to have been poorly written to accomplish that goal. It has been alleged that the Italians used chemical weapons against Ethiopian troops in their conflict in 1936. There was officially no use of chemical weapons during WWII, although there have been unverified reports that the Japanese used chemical weapons against Chinese forces.

More recently there have been increasing reports of the use of chemical weapons in various parts of the world. The use of chemical agents in the Iran–Iraq conflict, the reported use of chemical weapons in southeast Asia, by Libya against Chad, and in Afghanistan have spurred renewed interest in seeking to prevent the use of these weapons. Preventing the use of asphyxiating gases and poisons in war is insufficient. There must also be provisions to eliminate CW agent production, storage, and weaponization. Without these provisions, a new ban or protocol may be no more effective than the Geneva Protocol has been.

Current interest in this area is evident by the January 1989 meeting of the ratifying countries of the 1925 protocol, recent talks between the United States and the

Soviet Union, and the attempt in Geneva (since 1968) to produce an international ban on the production, storage, weaponization, and use of chemical warfare agents. But interest alone is not enough for such an endeavor.

It will be extremely difficult to achieve a 100 percent verifiable ban on chemical weapons. There is still much debate on the classification of chemicals used to produce chemical agents, inspection procedures, integration of the world's chemical industry, and the authority vested in the ban.

A number of ways exist to classify chemicals used to produce CW agents. One method is to prepare a hierarchy of substances required to produce a given CW agent by their relation to the production process. In this way, key precursors and other chemicals that may be combined to manufacture a particular CW agent are listed in a descending order. ("Key precursors" are specific chemicals or chemical compounds that are either one or two steps away from a CW agent or must be present for the production of a particular chemical agent or type of chemical agent. Chemical industries and customs agencies monitor the production and disposition of most of these precursors internationally. A few of these chemicals serve no practical use other than the production of chemical agents, while most do have legitimate commercial value.)

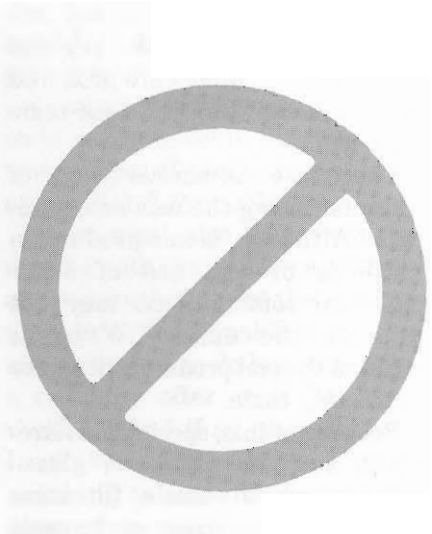
This method lists those chemicals that should be monitored. But determining where to draw the line on what to monitor poses a problem. The more generations away from the CW agent, the more common the substances become.

Another method is to create categories based upon either a substance's toxicity or the possibility of its use as a CW agent. For example: Category A1 could include supertoxic substances such as Parathion or known toxic CW agents such as nerve agents (some would include S- and N- mustards and Lewisite). Category A2 could include the key precursors required to produce supertoxic substances (some chemicals that fit here are thiodiglycol, pinacolyl alcohol, and chemicals which contain a phosphorous-alkyl bond where the alkyl is ethyl or methyl).

Category B1 could include other lethal chemicals such as hydrogen cyanide or cyanogen chloride (blood agents) or phosgene (choking agent) which have legitimate commercial uses but have been or could be used as CW agents.

Category B2 could include other precursors such as phosphorus trichloride (PC13) or phosphorus oxychloride (POC13) which could be used for nerve agents. Other categories could be added as necessary. Some reports using this method, such as the Stockholm International Peace Research Institute (SIPRI) Report CD/514, included glycollate incapacitants in category A1. Carbamates may also be included by certain countries.

This discussion brings out only some of the difficulties in determining which substances should be monitored. Whether incapacitants and novel agents should be included, and how new types of CW agents could be found out and included are other points of concern. Some countries would request that herbicides, smoke and flame materials, and riot control agents also be included in any ban.



Another major area of debate is inspection and verification procedures. The technology required to produce CW agents is very basic, although constructing a major chemical production facility and bulk storage does require availability of higher technology.

On-site inspections are the primary means of determining compliance with a ban. One problem with on-site inspections is that a high technology-based facility that produces pharmaceutical products, industrial insecticides, or fertilizers can be converted in a relatively short period of time (suggested to be as little as 12 hours) to produce CW agents.

In the same timeframe, a factory could be converted back to allow production of the original product. This is because the required materials (glass-lined pressure vessels and other special items) for this type of substance production can also be used for CW agent production. With this in mind, the answer would seem to be either no notice or extremely short notice inspections. This would work for most of the free world industries but would not be feasible for the majority of state run or nationalistic industries due to the requirement for visas, verification of appropriate paperwork, and notification of the facility to be inspected—all of which would take time.

This is not to infer that on-site inspections would be useless. They would necessarily need to be an integral part of any ban. However,

other verification procedures would need to be utilized in conjunction with on-site inspections.

One method would be to analyze upstream and downstream water around the facility to determine if substances other than those said to be produced are being manufactured. Traces of chemicals will stay in the water for relatively long periods of time (weeks to months or more). This could be used as a means of verification as long as the analytical methods for each site are the same.

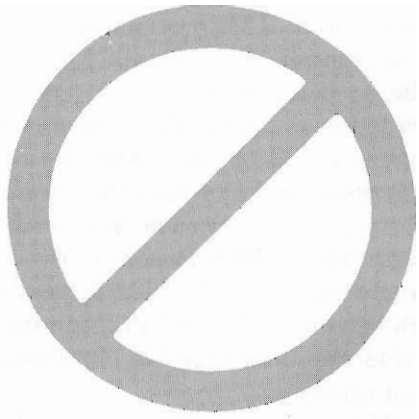
Another method would be to monitor the quantities of certain chemicals that are brought into a facility for the production of stated substances and compare these quantities with those used by other plants which produce the same or similar substances. This could be supplemented by monitoring the use of the produced substances, either in the country or exported by the country. Waste products from the facility may also prove to be valuable in determining the types of substances produced.

Integration of the world's chemical and pharmaceutical industries is an extremely delicate area of concern. Problems exist not only with getting the industries of different countries to agree on certain aspects of inspections, but also with companies within the various industrialized countries.

The laws governing patents, trade secrets, and proprietary rights are not the same in all countries, and nearly every company has its own trade secrets it does not want divulged for the sake of compliance. Many of these trade secrets or proprietary rights, if exposed, could reduce or eliminate any advantage a company has over its competition.

No company would allow this without fighting. Let's examine a hypothetical situation: An American pharmaceutical company on the verge of producing a new drug is notified that it's to be inspected for compliance with the ban. To protect its interest in the new drug, the company files to get a court order to prevent the inspection. An injunction would probably be granted but, even if it wasn't, the company could postpone the inspection by filing a lawsuit for litigation. This scene could be acted out in most of the industrialized countries.

As mentioned earlier, the production and distribution of most of the key precursors is monitored. Appropriate import and export controls are needed to reduce the possibility of further proliferation of CW agents. But regulating the



primary chemicals required for CW agent production is only one step. The majority of the key and secondary precursors are produced from combining other, less toxic chemicals.

There are numerous ways of manufacturing the needed chemicals. Although some production methods or the use of other chemical combinations may not produce the exact CW agent desired, the end product still can be extremely toxic.

Because of this, specialized hardware, such as distillers, glass-lined pressure vessels, filtration systems, and other equipment manufactured solely for the purpose of chemical/pharmaceutical production or storage, must be controlled.

Such materials are designed to increase their resistance to corrosion by chemicals. Almost every industrialized nation has companies that manufacture these types of equipment. When the market on a company's products is restricted, competition from other companies increases. There's a greater likelihood that some companies would be tempted to sell their products to unauthorized countries—a very real concern to prevent proliferation. Many companies could sell a complete production facility to a buyer with enough money, but this is easy to monitor. Identifying a buyer who has bought enough hardware from different companies to complete a facility is more difficult. Any ban, therefore, must seek to insure that this market is not only monitored adequately but is open enough to allow for free enterprise.

Our chemical/pharmaceutical industries rely on free enterprise for their survival and prosperity. The same type industries operate quite differently in state-run countries. Their production by quotas or other requirements relies on the needs of their governments. Many companies within these countries supply not only civilian needs, but also the needs of their respective military forces.

Monitoring the production of certain materials (hardware and chemicals) from these countries is not as easy as in free world countries. These governments could restrict the release of some information vital to monitoring, citing that the information could give away secrets regarding military capabilities.

Monitoring the sale of chemical substances and production hardware from these countries also would prove difficult, primarily

"The international community must work together to find a solution to the CW problem."

because the information provided by the government would be difficult to verify. In some cases, the petro–chemical and other chemical industries are an integral part of the military structure, making inspections and verification even more difficult for these facilities.

Any military or civilian facility of special interest could be subject to inspection. It wouldn't be difficult for a country to suggest that a banned substance is being produced at another laboratory or military installation simply to gain information on that facility. There must be guidelines in any ban that would prevent unwarranted inspections, yet allow those that are justified.

What about violators? How does the international community deal with countries that do not abide by the ban? What types of penalties would be appropriate? There have been many suggestions recently–especially after news of West German involvement in aiding Lybia to acquire a CW agent production capability. If the country used chemical warfare (after the ban went into effect) or stated that it would have no reservations about its use, would this determine whether or not military action is warranted?

What organization would have jurisdiction to authorize that type of action, and who would perform the military action? Proof of violating the ban certainly would be needed for any action. The ban would have to define what was a violation and what would be required as proof of non–compliance. Economic sanctions are one means of penalizing a country, but what about that country's people? Should they be punished for the acts of their government, or a few within their government? If economic sanctions were imposed, could the ban state which types of sanctions would be appropriate? Probably not.

There must also be a means of dealing with the country and those companies that assist the violator to acquire the capability. Do we simply refuse to do business with a company after proof has been verified? And if so, then for how long? Would levying a fine do anything to prevent the proliferation of chemical weapons?

These are the types of questions that must not only be asked, but answered as well. The international community must work together to find a solution to the CW problem. Cooperation among the chemical and pharmaceutical industries throughout the world will be needed to allow them to police their own industries. Until an acceptable ban is achieved and ratified, a watchful eye must be kept on the world to try and prevent the proliferation of CW.

The author acknowledges and applauds the member nations of the Australian Working Group, the negotiators at Geneva, the Commerce Department, and the President of the United States for their continuing efforts to eliminate the proliferation of CW agents and to secure a total ban on chemical weapons.

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