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The release of the nerve agent Sarin in Tokyo's subway system on March 20, marks the first clearly non-state terrorist use of chemical weapons. The agent was highly diluted and fatalities were relatively few (10), though the number of injured was substantial (5,000+, with 600 hospitalized). This incident clearly indicates the potential political effectiveness of chemical weapons against an unprotected civilian population. Once a population has been sensitized by an incident like this, even the threat of CW can become significantly disruptive. Some have credited fear of another attack with contributing to the cautiousness of the Japanese police investigation.[1]

1. Initially discovered in the 1930's in the course of insecticide research, nerve agents destroy the regulatory ability of the body's nervous system. Though colloquially called "nerve gases", these agents are, in fact, liquids which give off a vapor. Sarin, also known as "GB", is an ester of phosphonofluoridic acid. It inhibits the production of cholinesterase in the body, an enzyme that regulates nerve impulses. The effects of nerve agents are highly dependent upon the amount of agent an individual is exposed to. Exposure to 55mg/cubic meter is considered sufficient dosage to incapacitate, while 70mg/cubic meter is sufficient to kill when inhaled. Nerve agents can also be absorbed through the skin, with a percutaneous lethal dosage estimated to be 12,000 mg for Sarin. Sarin is considered a "non-persistent" because it dissipates

relatively quickly (1/4-4 hours) depending on temperature, wind speed, and precipitation. Initial nerve agent effects are difficulty in breathing, dimming vision, accompanied by pain in the eyes and nose. As symptoms intensify, the victim is subject to nausea, involuntary urination and defecation, and loss of muscle control. Death occurs by asphyxiation as a result of muscle exhaustion and pulmonary edema. Depending on the dosage received, death can result within 2-15 minutes.

Packages leaking Sarin nerve agent were placed almost simultaneously aboard five subway cars, eventually affecting passengers in sixteen stations. Five days previously, three briefcases had been discovered in a Tokyo subway station. Each case contained three tanks with an unknown liquid, a motorized fan, vent, and battery power source. On March 5, nineteen passengers on the Yokohama subway were hospitalized for eye and respiratory pain from unidentified fumes. In June 1994, seven people were killed by a still unexplained release of Sarin in the central Japanese town of Matsumoto in the neighborhood of a Buddhist religious cult-- Aum Shinri Kyo. Subsequent police raids have discovered literally tons of Sarin precursor chemicals, along with

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sophisticated laboratories and production equipment in the cult's facilities. Police investigations have also revealed evidence that Aum members were carrying out research on botulism and other biological warfare agents. Aum Shinri Kyo's leader has denied any connection with the CW attack, but remains in hiding.

On April 19, about 400 people received medical treatment after a gas was apparently released in Yokohama' main railway station and a commuter train. Yokohama authorities initially identified the gas as phosgene (carbonyl chloride), but now believe that it was a form of tear-gas or respiratory irritant and that the incident may have been a "copy-cat" attack.

At a time when over 150 nations have signed a Chemical Weapons Convention (CWC) to ban these weapons, this incident points out that the arena for their use has expanded. Chemical weapons can no longer be treated as a monopoly of nation-states or state-sponsored terrorists. The occasion for their use is no longer only international conflict. Relatively small amounts of chemical agent, amateurishly dispersed, are now demonstrably a threat to peacetime urban populations. This may serve to shift some attention away from international proliferation and sophisticated delivery systems to domestic control issues. The CWC requires State Parties to criminalize even the manufacture of chemical agents like Sarin, which would provide most countries the first legal framework to address this unique threat. Implementing legislation for the CWC, which will be considered by both the House and Senate when submitted, will address this issue. The Biological Antiterrorism Act of 1989 criminalized the manufacture of biological weapons in the United States or by U.S. citizens.

The CWC has been submitted to the Senate for its advice and consent. The Senate Foreign Relations Committee may hold additional hearings before it reports the ratification resolution, and it is likely that the implications of the Tokyo CW attack will come under examination. Supporters of the Convention may contend that such incidents should speed up the ratification process, bringing the Convention into force, and beginning the international process for the monitoring and destruction of chemical weapons. For others, the incident may exacerbate concerns about the potential effectiveness of the Convention's verification regime, particularly with regard to production of relatively small amounts of CW useful for non-military objectives.