

Nerve Gases

History

Prior to WWI toxic products have been used to kill or immobilize the enemy since the time of the Assyrians in 600 BC. They used ergot in the enemy's wells to poison their foes. No large-scale chemical attacks were recorded throughout history until the early twentieth century, when the might of more modern industrialized nations changed the nature of war.

Between 1914 and 1918, over sixty chemicals were employed in gas warfare. Some were hard to disperse effectively such as chlorine and phosgene. Mustard was the most potent and commonly used gas of World War 1 and due to its persistence, caused the most casualties of any chemical agent.

Following World War I, an increasing awareness of the importance of chemical warfare existed. Mustard was too persistent, too hard to control and protection by the aggressor as well as the defender was extremely poor against this agent. Something better had to replace these noxious gases. The hunt was on for more efficient, and more potent agents. Delivery systems and protective equipment also improved to make the older gases obsolete. Nerve gases were that substitute. They are between 15 and 100 times more potent than any of the gases of World War 1.

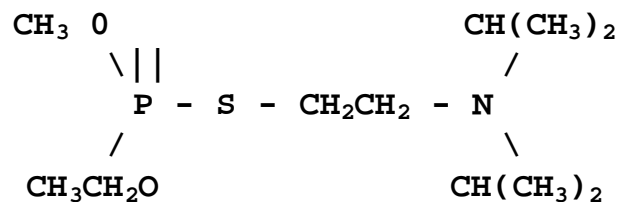
Current nerve gases are synthetic esters of phosphonic acid and are related to organophosphates, which are used as insecticides and occasionally in medicine. Our current treatment of Alzheimer's disease, in fact, utilizes a reversible type carbamate organophosphate.

The first organophosphate to be discovered was in 1854 and used strictly as an insecticide. In December 1936, Gerhard Schrader, head of a research team to discover new insecticides at I. G. Farbenindustrie, synthesized Tabun in a search for a new insecticide. One year later his team synthesized Sarin. Military use was recognized early and by 1942, Tabun production was begun by the Nazis. Thirty thousand tons of Tabun were placed in shells and bombs between 1942 and 1945. Only 0.5 tons of Sarin was produced during this time. The Soviets captured this facility and moved it to the Soviet Union with Sarin and Tabun production initiated in 1946. Soman was discovered in Germany in 1944. The North Atlantic Treaty Organization designated Tabun as GA. Sarin was designated GB and Soman was GD. In addition there is a compound termed GF with no common name. More recently synthesized in 1952 in Port Down, Wiltshire England is a toxic product termed VX, which is a less volatile liquid and thus more persistent. It is the most toxic of the 5 recognized nerve gases. There is no common name for this compound, which is methylphosphonothioic acid. The Soviets in fact had been reported to have develop an even more deadly series.

Why did Hitler not use his thousands of tons of nerve gas? No one is sure. It would have had a major impact on behalf of the German military

and may have influenced the outcome of the war since we did not possess this agent. There is some evidence that Hitler was advised not to use chemical weapons due to massive retribution that would occur. Hitler's Minister of Production, Albert Speer, said after the war, "All sensible army people turned gas warfare down as being utterly insane, since, in view of America's superiority in the air, it would not be long before it would bring the most terrible catastrophe upon German cities." More likely, we should remember that in 1918 a young corporal named Adolph Hitler was temporarily blinded by a British gas attack in Flanders and personally experienced the horrors of gassing.

After WW II, The Soviet troops captured the factories manufacturing tabun and sarin and immediately resumed production. Many developed nations, including the United States, conducted research and acquired stockpiles of nerve gases as well as biological agents. More recently less developed nations have acquired this technology. Of the seven nations regarded by the State Department to be terrorist supporting, five have developed biologic and chemical weapons. It is looked at as a status symbol. Most of the United States chemical development occurred at Edgewood chemical and Biological Center (ECBC) at the Aberdeen Proving Ground, Maryland. By order of President Nixon, all of our biologic agents were destroyed in 1969 and 1970 (except for a small amount for research purposes or held by the CIA). By contrast our chemical stockpiles still exist and are being destroyed very slowly for "technical reasons". As an example, 1,269 steel containers of VX gas sit at the Newport Chemical Depot in western Indiana.



VX

There is evidence that Tabun was used by Iraq on Iran in their 1982-85 war. It was also used by Iraq on elements of the Kurdish minority in northern Iraq. Even Kurdish extremists used it against a Turkish village. In 1995, UN inspectors verified that Iraq had loaded sarin into Scud missiles as well as artillery shells. In 1998 traces of VX were also found on fragments of destroyed Iraqi Scud missiles. Iraq has denied the deployment of VX.

In Operation Desert Storm, belatedly the Department of Defense has stated that it is possible that 98,910 soldiers were exposed to low levels of

Iraqi nerve gas when troops destroyed a weapons cache at Khamishia, Iraq in 1991. There were up to 1200 chemical canisters and shells destroyed. Czech chemical detectors indicated the presence of nerve gas after some Scud attacks. This is believed by some to play a role in the Gulf War syndrome, especially when combined with the heavy use of organophosphate insecticides, pyridostigmine (a carbamate), and DEET dog collars worn around the neck of many servicemen. This matter remains controversial.

In 1987 Chizuo Matsumoto, alias Shoko Asahara, founded a sect of primitive Buddhism worshiping the God Shiva, the God of creation and destruction. Destruction was a part of this cult's belief system and in June 1994 this cult, Aum Shinrikyo released sarin nerve gas and injured over 200 and killed seven. This was apparently a dress rehearsal as they again released sarin gas, which they manufactured, on March 29th 1995 simultaneously on three separate subway systems. Sarin is 26 times more deadly than cyanide and is odorless and colorless. In a coordinated attack, the tip of an umbrella punctured lunch boxes and soft drink containers containing sarin placed on the subway train floor. The cult members then immediately left the train. This attack was designed to coincide with rush hour in Tokyo. St. Luke's International Hospital in downtown Tokyo saw 641 victims on that day and another 347 in the days that followed. Five arrived in cardiac arrest with severe miosis and very low cholinesterase levels. Two died and three recovered completely with proper medical care. One hundred and six were hospitalized. Over 20% of the medical staff suffered from mild delayed sarin poisoning due to ineffective decontamination. Altogether there were 12 deaths and 5,500 injuries

This incident serves as a warning as the materials to make sarin are not too difficult to acquire and not difficult to produce. Interestingly the Allies cut off the chemicals to produce sarin to Saddam Hussein when the conflict was imminent in 1991 so that intelligence reported that he produced GD (soman) instead. Due to certain characteristics of soman, the best therapy is preventive measures using pyridostigmine in our troops. On June 24, 1998 UN weapon inspectors indicated that the Iraqis had also filled missiles with VX. A claim that was vehemently denied by the Iraqis.

VX gas again came to the public's attention when the United States bombed a Sudanese factory said to be manufacturing VX.

More recent experiences with nerve gas include a report from the London Telegraph dated February 10, 2001 that senior London police officials confirm that they exposed a terrorist plot to use sarin gas in the London underground in a recreation of the Japanese attack. These terrorists are being linked to others in Germany that have ties to Osama Bin Laden

On December 10th, 2001, Israeli police told the Times of London that a recent suicide bomber carried “rat poison” in a container in hopes of killing more rescuers. Thus the battle with terrorism continues.

A report from the American Journal of Public Health May 2000 indicates that less than 20% of 186 hospital emergency rooms in the northeast United States polled have a plan to treat biological or chemical terrorist acts. Only 14% have a self-contained breathing device and 47% have facilities to decontaminate. This excerpted form “Hospital Preparedness for Victims of Chemical or Biological Terrorism.” Contact: Donald Clark-Wetter, PA-C, MPH, US Public Health Service.]

