



Sulfur Mustard — an "Outlawed" WWI Vesicant



By John Loofbourow, MD

This is the fifth article in a series on terrorist warfare.

At 3 a.m. on a summer Sunday, an 18-wheeler rolls down Highway 80 past Roseville, trailing a light orange mist, almost invisible in warm night air. It moves on to Sacramento next to the W-X streets, West Sacramento and Davis, where it is abandoned at Sycamore and Russell Streets. At the junction of Highways 5 and 80, a sister rented semi arrives from Stockton, turns right at P Street and continues on a circuitous route to Fair Oaks Boulevard and ends at Folsom.

Between 3 a.m. and 5 a.m., tens of thousands have been exposed to a vaporized vesicant. They note a garlic-like smell, but little else. During the next 2-24 hours they develop persistent respiratory and eye irritation, and burning of the skin. Alarmed, they find that many others have the same symptoms, and it is obvious that something is very wrong.

ED phone lines and waiting rooms are overwhelmed; medical staff are exposed to the same vesicant, before finding that decontamination (within minutes, with soap and water or dilute bleach) and protection of hospital staff from secondary exposure are vital.

Adequate decontamination equipment, procedures, and protective clothing are not readily available let alone large amounts of bleach. Some major hospitals are in the exposed zones close to freeways, and their triage and decontamination must be moved to an uncontaminated parking lot or school. Someone suggests contacting pool supply stores and markets for bleach. Meanwhile, hospital staff must do the best they can with gloves, surgical masks, face shields and makeshift barriers.

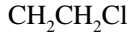
The Health Department quickly finds the micro aerosolized vesicant to be simply sulfur mustard, of the type used in World War I, absorbed immediately but with multiple delayed effects. It becomes clear that the results of decontamination efforts have been minimal. Within 48 hours of exposure, symptoms appear, including: Respiratory failure, blisters requiring debridement and, later, bone marrow depression. While most hospital staff are not so affected as the original victims, skin lesions and bronchitis are very slow to resolve.

Nationally, hyper-coverage by the media fuels panic, as people desperately try to acquire gas masks and bleach, and crowd into rural areas. Conflicting views about the likelihood of similar attacks, and the nature of vesicants abound, amid official calls for calm, and assurances that further similar attacks are unlikely. Heavy truck traffic is suspended, commerce is nearly completely halted, and a state of heightened public alertness is called for despite the call for calm. Gradually, over the next six months, it becomes clear that morbidity and mortality resulting from the attack are quite low, and the nation moves toward a recovery.

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Sulfur mustard is a simple, and widely available agent that could be used to create chaos and panic, a principal goal of terrorism, taking advantage of our freeway system for access to densely populated areas, in just the right weather conditions.

Mustard, used in WWI, and thereafter outlawed, was employed in the 1980s by Iraq against Iranian soldiers and on Iraqi Kurdish civilians. Among similar vesicants, mustard has the relative advantage of delayed effects and persistence; however, it is not effective in cold weather. A comparison with phosgene and lewisite can be downloaded from page 199 of the Textbook of Military Medicine, at <http://ccc.apgea.army.mil>.

Local and State Health Departments are the prime source of local current information.

Other helpful sites include:

Biologic:

<http://www.usamriid.army.mil>

Radiologic:

<http://www.afri.usuhs.mil>

Public Health Emergency Response:

<http://www.bt.cdc.gov>

Terror Response:

<http://www.usfa.fema.gov/pdf/ertss.pdf>

Hazardous materials:

<http://hazmat.dot.gov>

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