

CHEMISTRY

Chemical Warfare Dangers

At the American Chemical Society meeting it was reported that nerve gases would be most lethal in chemical warfare. U. S. scientists have worked on new detection methods.

THE LATEST chemical or biological warfare agents, carried in a single bomber, could kill more people than an H-bomb. At this moment the U.S. population has virtually no means of protecting itself in the initial stages of the attack.

At a meeting of the American Chemical Society in Cleveland, Ohio, Dr. William H. Summerson of the U.S. Army Chemical Corps reported that nerve gases are the most lethal agent that could be used in chemical warfare. These gases kill in minutes by overstimulating the nervous system. Some are so powerful that an aspirin-sized amount of the dried powder can kill 350 animals. There is no detectable odor or color; the victim inhales the gas and dies before anything can be done to save him.

A bomber load of these gases could kill

30% of the people in a 100-square-mile area. The area could be dangerous for as long as 36 hours.

Biological agents (450 pounds) could kill 75% of the people in a 34,000-square-mile area. The residual effects could last up to eight days and once an epidemic was started, it could spread to a much larger area.

Dr. LeRoy D. Fothergill of the U.S. Army Biological Warfare Laboratory, Ft. Detrick, Md., reported that diseases such as typhoid, cholera, anthrax, and rabies could be dispersed by dropping aerosol bombs. The organisms could also be put into water, food and drug supplies, or they could lie dormant in the soil.

Gen. Marshall Stubbs, the Army's Chief Chemical Officer, noted that chemical and biological agents, used together or in com-

ination with nuclear weapons, could wreak untold havoc on an unprepared nation.

Soviet microbiologists, he said, have conducted biological tests in an isolated location over a long period of time. Medical and technical reports indicate that the Russians are well versed in biological warfare.

The officials of DOSAAF, a Soviet program for the military education of civilians, claim that 85% of the population has completed a 10-hour anti-air defense course. The present aim of the organization is to train every citizen in defense against chemical, biological and radiological attack.

The Soviet Union has the physical facilities and the know how to make a successful chemical or biological attack, he stated.

Dr. Alan W. Donaldson of the Public Health Service, Atlanta, Ga., reported that U.S. scientists have been working on new detection methods. The new fluorescein antibody technique is proving fairly successful in identifying many biological agents.

Civilian protective masks have been developed but they are not generally available to the public, said George D. Rich of Washington.

On the other hand, the Russians have gas masks and shelters in many of their public buildings.

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Relative Effects of CBR Weapons. Table prepared by the ACS Committee on Civil Defense

Basic Assumption: For the purposes of this table one B-52 bomber (or its equivalent) is considered capable of carrying either one 20-megaton thermonuclear bomb or enough chemical warfare or biological warfare agents to create the comparable results shown in this table.

	<i>Nuclear Agents</i>	<i>Chemical Agents</i>	<i>Biological Agents</i>
Immediate effective area	More than 36 square miles (A & B rings)	100 square miles	34,000 square miles at the very least and with only 450 lbs. of agent
Human lethality (or morbidity) in immediate area (unprotected)	98% (Lethality—A ring)	30% (not necessarily lethal)	25%-75% (morbidity, not necessarily lethal)
Residual effect	Six months fallout with an additional 1,000 square miles of area	3-36 hours (nearly same area)	Up to 8 days or more (possible epidemic spread to other areas)
Time for immediate effect	Seconds	7½ seconds to 30 min.	A few minutes to 14 days
Real property damage, immediate area	Destroyed (nearly 36 sq. miles)	Undamaged	Undamaged
Variation in effect	Little	Wide—need not kill, only incapacitate	Wide—need not kill, only incapacitate
Time an aggressor is able to safely invade area after attack	3-6 months	Immediate	Immediate
Human protection that could be available	Evacuation (?) Shelters Civilian mask (fallout)	Civilian mask, CD-V-805 Shelters with filters	Civilian mask, CD-V-805 Immunization Shelters with filters
Current defense for U.S. population (physical devices)	Some, but can be greatly improved	Nearly nonexistent	Nearly nonexistent
Cost of protection	Shelters (150-\$800/person)	Mask—\$2.50-\$8.00 Filters in shelters (\$15-\$20/person)	Mask—\$2.50-\$8.00 Filters in shelters (\$15-\$20/person) Immunization (?)
Covert application	Little	Some	Great
Detection and identification	Simple	Complex but fairly effective and rapid	Difficult, complex, slow
Medical countermeasures	Little	Good if immediate	Some, much more needed. High health and sanitation standards help.
Would attack trigger retaliation?	Yes	Yes	Doubtful if covert, slow at most
Capital equipment costs to produce agents	Very expensive	Somewhat expensive	Relatively inexpensive