

October 29, 1927

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## SCIENCE AND INVENTION

### THE BLESSINGS OF CHEMICAL WARFARE

**P**OISONOUS gas as used in warfare is "a blessing, not a curse," and makes for the future security and peace of the world, declares J. E. Mills, of the U. S. Chemical Warfare Service, in a lecture given recently before the Institute of Chemistry at Pennsylvania State College. Our quotations below are from an abstract issued by the American Chemical Society. We read:

Theoretically one ton of mustard gas could kill 45,000,000 men. Actually one ton of mustard gas as used at the front caused about twenty-nine casualties, of which one died.

Is gas warfare inhumane? All warfare is inhumane and barbarous, but the facts are that only 2 per cent. of American gas casualties died, while more than 24 per cent. of American battle casualties died.

In an ideal world, what armament adjustment is desirable? The situation can be summed up in one sentence. National security without large national armaments.

Many men have read wrongly the tendencies of the new developments of the past war, says Mr. Mills. Three new and powerful weapons were developed—airplanes, gas, and submarines. It is fortunate for the world, he declares, that two of these, airplanes and gas, are bound up with the development of civilization. He explains:



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It will be a blessing to the world, not a curse, if its water-power can be turned to the production of cheaper fertilizer in time of peace, and yet aid tremendously in securing national security in time of war.

It is a blessing to the world, not a curse, that dye factories can change almost overnight from the manufacture of dyes and perfumes that appeal to the taste and vanity of mankind, to the manufacture of the most powerful poisons for use in war.

Airplanes and gas warfare give to a nation a powerful means of defense in time of emergency without serious expenditure in time of peace. This is a blessing and makes for the future peace of the world. It means eventually national security without large national armaments.

Alarmists have repeatedly mistaken the effect of new inventions. The ability to wage gas warfare is a blessing—not a curse—and will make for the future security, peace, and happiness of the world.

Gas warfare as it stands to-day, and as it will stand in the future, as far as future tendencies can be foreseen, is a more powerful defensive than offensive weapon. This fact arises primarily because mustard gas, and similar gases, can be used to prevent the occupation of territory. Invasion is, therefore, rendered much more difficult.

It is not possible to limit by the abolishment of chemical warfare research for new poisonous compounds. Poisonous compounds are a necessity of modern civilization. The development of insecticides, fungicides, germicides, disinfectants, preservatives, fumigants, medicinals, etc., calls for intensive study of poisonous compounds. It is, therefore, both certain and essential that research upon poisonous compounds will be continued.