SAND2018-11531C

Chemical Security Education in the U.S.

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Daesh/ISIL/ISIS and the Capture of Mosul

Mosul University Before Daesh

Mosul captured in June 2014

Daesh/ISIL/ISIS and the Capture of Mosul

Mosul University After Daesh

Early 2017

Question

What does this have to do with Chemistry?

What Does this Have to Do with Chemistry?

Labs at Mosul University

What Does this Have to Do with Chemistry?

chemical weapons

What Does this Have to Do with Chemistry?

airport security testing equipment

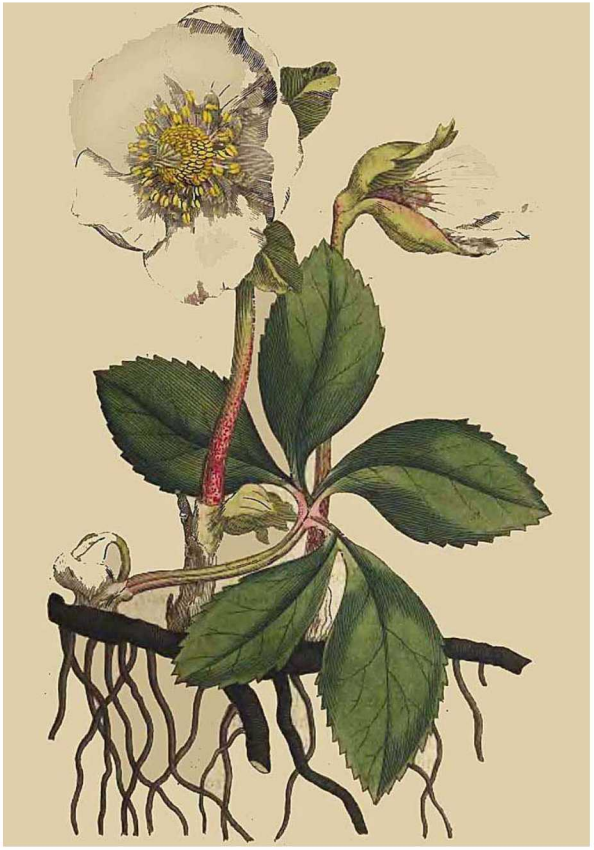
What Does this Have to Do with Chemistry?

technical experts

Chemical Weapons—An Ancient Problem

1000 B.C.—China:
Arsenical Smoke

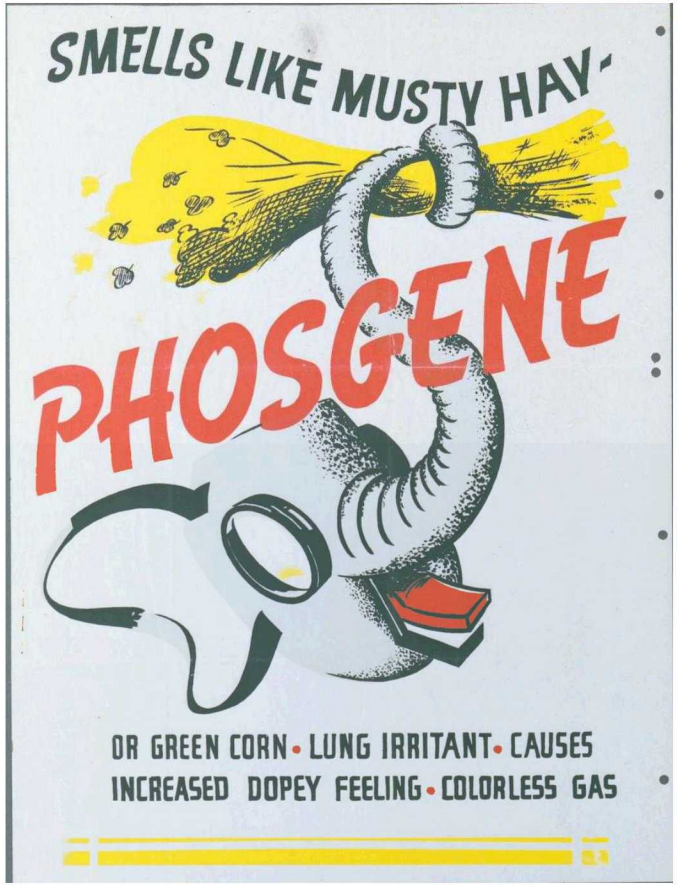
photo from: http://www.globalhealingcenter.com/about



600 B.C.—Greece: Helleborus

Photo from http://www.gutenberg.net

Chemical Weapons—Dual-Use Chemicals



WWI– Europe: Chlorine, Phosgene, Mustard

Photo from:
http://www.slate.com/content/dam/slate/blogs/the_vault/2013/5/24/PhosgeneFinal.jpg.CROP.article920-large.jpg

Use of Poisonous Gas Declared Inhumane

"the use in war of asphyxiating, poisonous or other gases, and of all analogous liquids materials or devices, has been justly condemned by the general opinion of the civilized world"

Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or other Gasses, and of Bacteriological Methods of Warfare, 1925

1937-present— Germany, Iraq, Japan, Hollywood: Organophosphates

Theatrical release June 7, 1996. Screen capture. Copyright © 1996 Hollywood Pictures Company, Don Simpson Productions, Inc. and Jerry Bruckheimer, Inc. Credit: © 1996 Hollywood Pictures / Courtesy: Pyxurz.

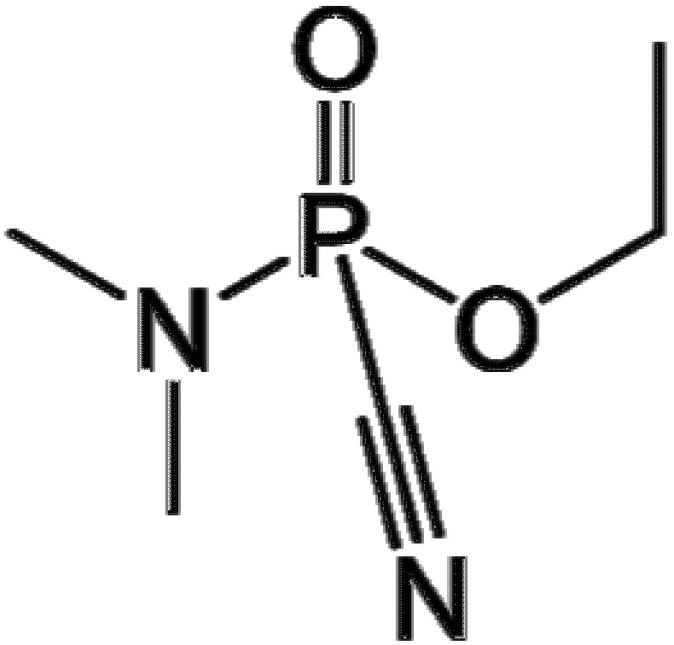
Former Secret Government Research Programs

Porton Down, UK

https://www.telegraph.co.uk/news/science/science-news/3292496/Porton-Down-scientists-face-charges-over-1950s-experiments.html

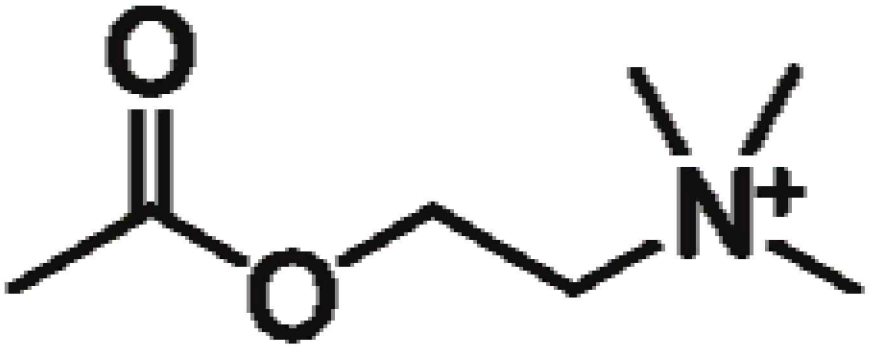
Chemical Weapons—Designed to Kill (1937)

Tabun



Acetylcholine

(a neurotransmitter that Tabun mimics)



Nerve Agents Used in War

Iraq-Iran War: Iraq was first nation to use nerve agent (Tabun) in warfare 1984 against Iran

Chemical Weapons—Non-State Actors

Aum Shinrikyo: nerve gas attacks in Matsumoto (1994)
and Tokyo Subway System (1995)

Chemical Weapons—Still A Threat Today

Syrian Chemical Weapons, 2013

Photo from: http://www.huffingtonpost.com/2013/08/21/syria-chemical-weapons_n_3788481.html

Chemical Weapons—Still A Threat Today

Kim Jong-Un, February 13, 2017

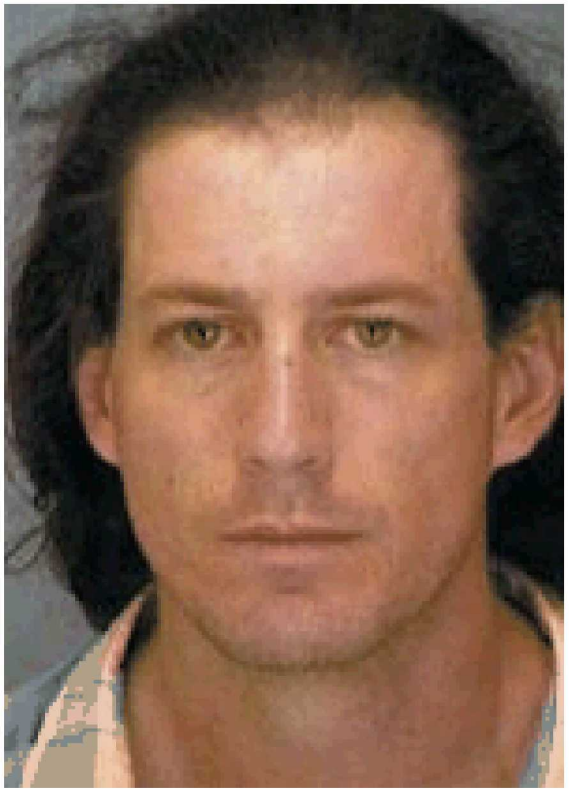
Photo from: http://www.abc.net.au/news/2017-02-15/kim-jong-un-half-brother-kim-jong-nam-dies-in-malaysia/8270840

Illicit Drug Production—Not just a Hollywood Drama

Breaking Bad, Albuquerque, NM

Photo from: http://www.nydailynews.com/life-style/eats/breaking-bad-inspired-cafe-walter-coffee-roastery-cooking-article-1.2781771

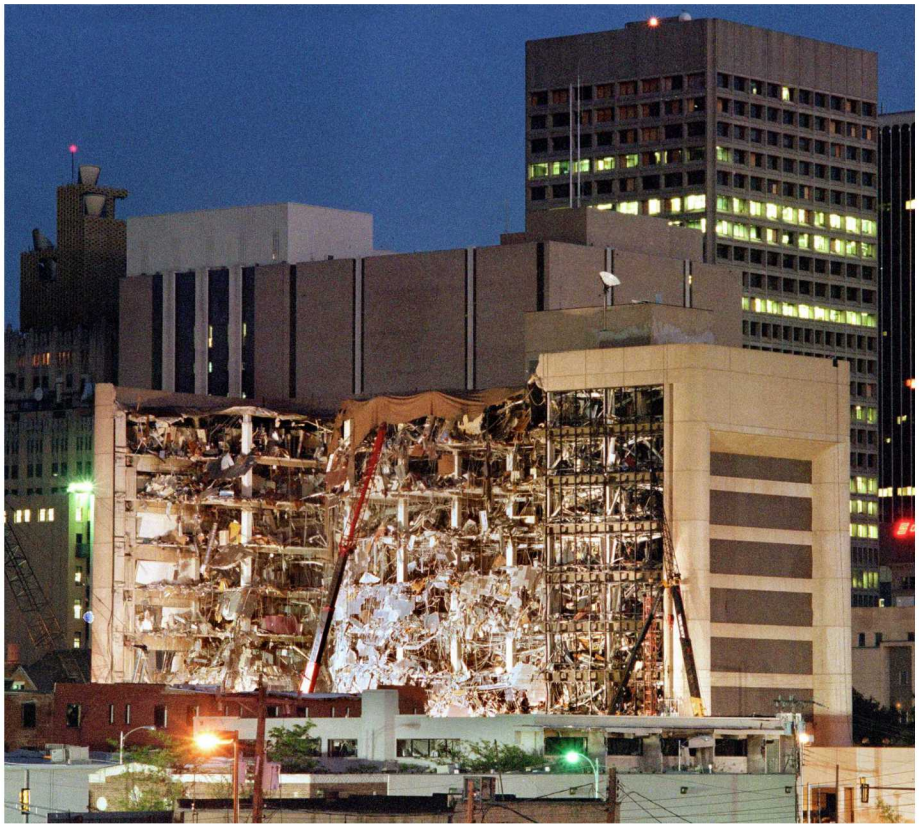
Illicit Drug Production—Not just a Hollywood Drama



2008, UC Merced, Student Stole ~$10k in chemicals to make meth

Photo from: http://cen.acs.org/articles/86/i36/Student-Suspected-Making-Meth.html

Explosives—Made from Chemicals



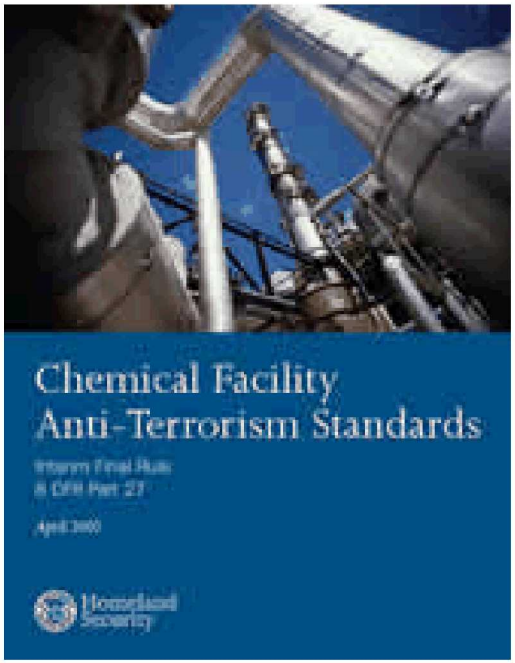
Oklahoma City Bombing, April 19, 1995

Photo from: http://newshour-tc.pbs.org/newshour/wp-content/uploads/2015/04/136396589.jpg

3 Arrested, March 16, 2017, George Mason University, bomb materials

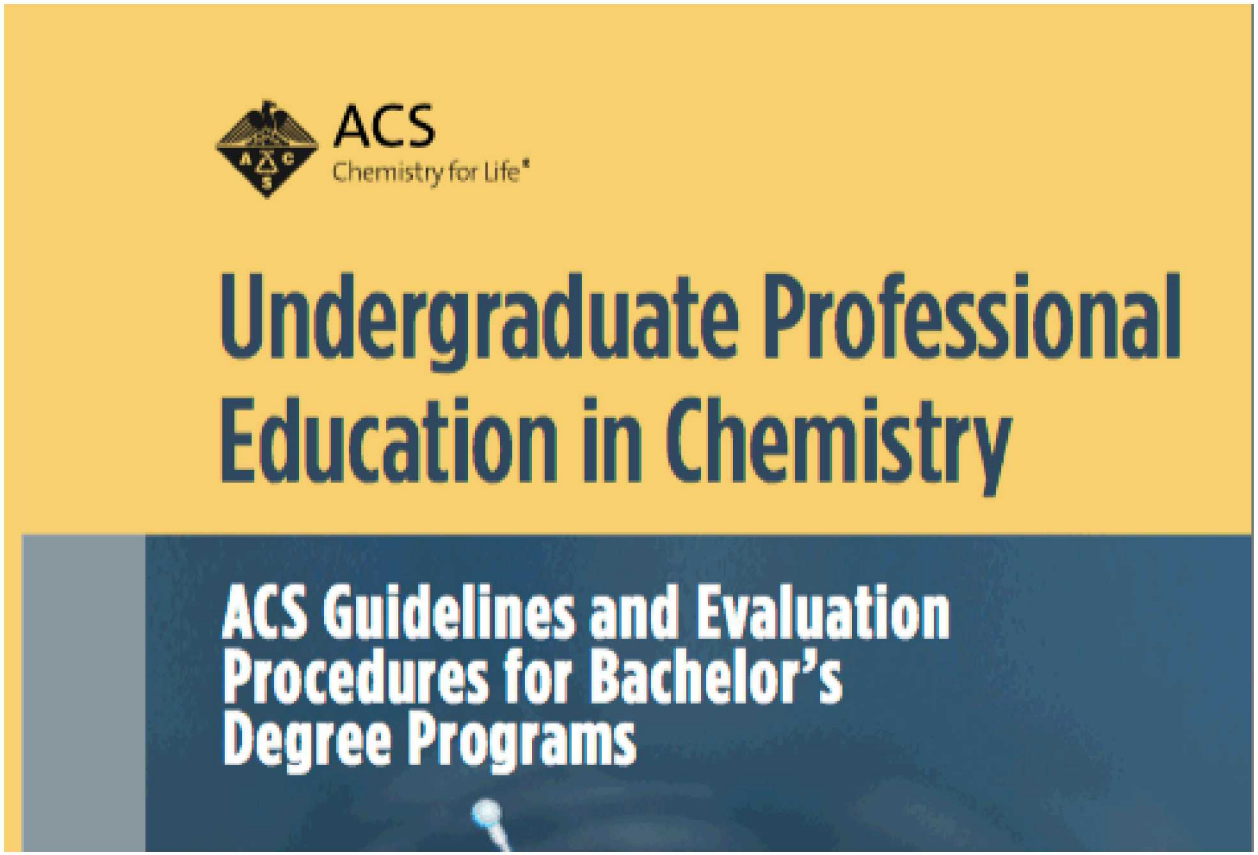
Photo from: http://www.nbcwashington.com/news/local/Three-George-Mason-University-Students-Barred-From-Campus-After-Fire-Bomb-Materials-Found-in-Dorm-Room-373247751.html

How Do We Stop Illicit Usage of Chemicals?



Photos from: https://issa.house.gov/news-room/press-releases/issa-bill-undoes-last-minute-presidential-regulations;

Change Culture through Education



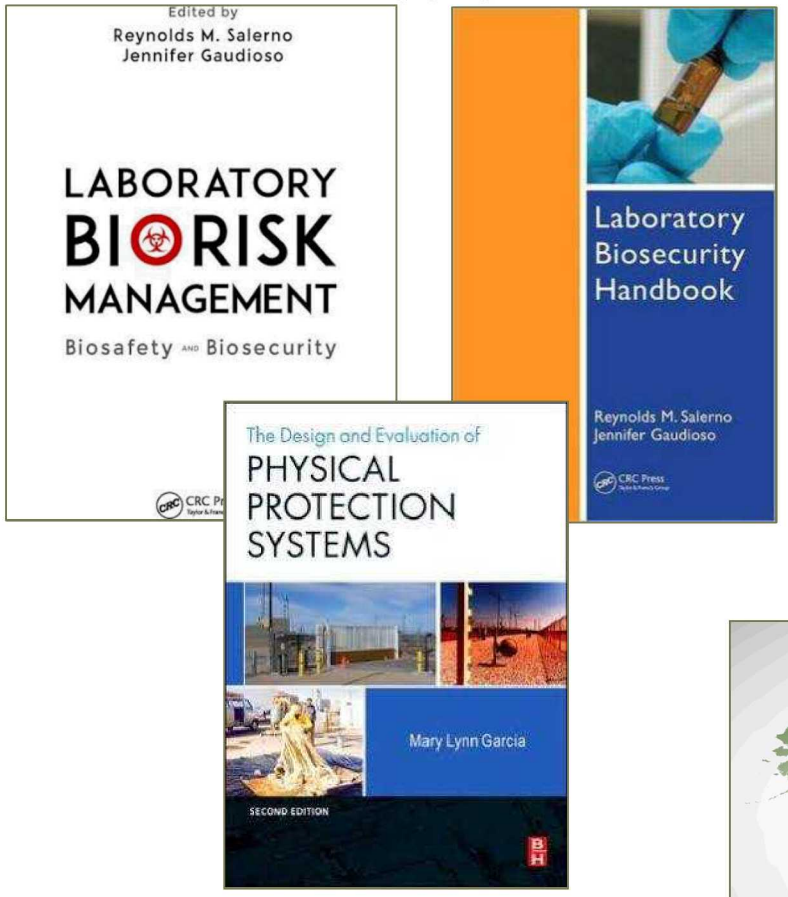
Word “Safe” mentioned 40 times, not a single mention of “Secure”

Key Messages

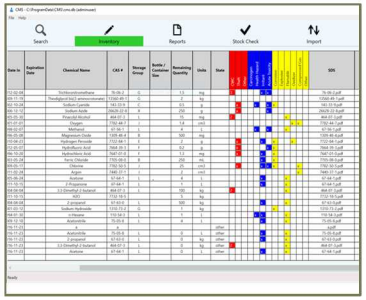
- Chemical Security is:
  - ancient AND ***current*** problem
  - important for developing and ***developed countries***
  - prevents weapons, illicit drugs, and explosives
  - **a teachable skill**!

Sandia Resources

Books



Software



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International Networks

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Thank you for your time!

Let's continue to discuss:

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