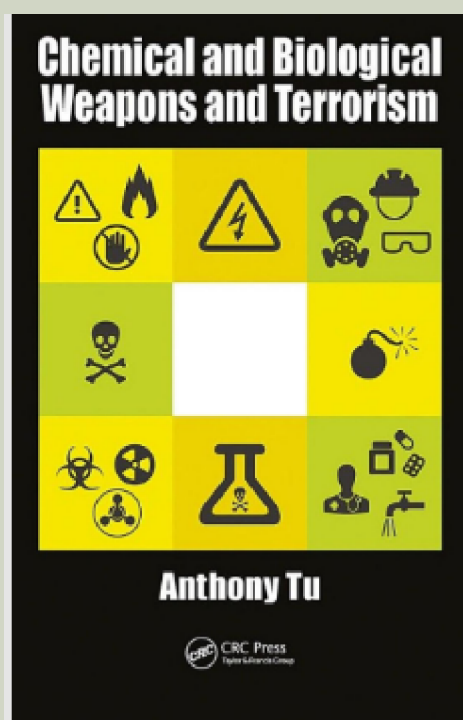


Chemical and Biological Weapons and Terrorism

by Anthony Tu,
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Toxic chemicals have been used for warfare purposes for thousands of years however first international agreement to limit the use of chemical weapons was signed by France and Germany in Strasbourg in 1675. Since then, numerous times poisonous chemicals ranging from temporarily debilitating tear gas to deadly Sarin gas have been used to defeat one's adversary. The most recent use of chemical weapons was reported in 2017 from the Syrian city of Douma in which 40 people were killed. The Organisation for the Prohibition of Chemical Weapons (OPCW) conducted an investigation and detected the use of "various chlorinated organic chemicals" while the Assad government denied the charges. In these circumstances, Chemical and Biological Weapons and Terrorism by Anthony Tu come as a breather for scholars interested in knowing about chemical and biological weapons.

Anthony Tu, who is Professor Emeritus at Department of Biochemistry and Molecular Biology, Colorado State University, tries to provide Bird's Eye view of CBW to the readers in this book. He begins the book explaining basic concepts like the difference between a chemical agent and a chemical weapon and goes on to list properties of various chemical agents including nerve gases, blister agents, blood agents and choking agents. Recipient of lifetime achievement award presented by Toxinological Society of India in 2013, Anthony Tu familiarizes the readers with the fact that humans, animals and crops can be damaged by micro organismic biological weapons, naturally occurring toxic weapons and by modified and genetically engineered toxins. Tu states that if an amino acid sequence of the protein is known, totally new toxins can be developed with the help of

genetic engineering (p. 31). Nevertheless, not every toxin can be used as a biological weapon. For a toxin to be used as a biological weapon it has to be easy to obtain, has high toxicity level, shall have stable nature, be easy to handle, be hard to detect, be hard to cure and should have the ability to become a stable aerosol (p. 31). Bacteria fulfills most of these conditions and that is why there are many precedents of Anthrax being used as a biological weapon. Small pox caused by Variola major has the potential to become one of the world's most dangerous biological weapon.

The author who received 'the order of the Golden Sun' by the Japanese emperor, describes incidents of use of CBW in the world including Anthrax attack in U.S., use of mustard gas and Sarin by Iraq against Iran, Halabja tragedy, use of Chlorine, Sarin and mustard gas by ISIS, use of chemical weapons in Syria, Sarin attack in Matsumoto and Tokyo subway Sarin attack in Japan. While elucidating the Sarin attack in Japan in chapter four, he provides a lucid description of the responsible Aum Shinrikyo Tibet Vajrayana Buddhist cult organization founded by Shoko Asahara. He explains in detail about its approved status in Japan, it's highly educated clientele, effective way of functioning, precision in executing the attacks and the role of the chemical scientist Masami Tsuchiya (p. 97). The author had an opportunity to meet one of the death row accused named Dr. Tomomasa Nakagawa (p.84) and he has used the garnered information to explain the attack. Towards the end, he has also explained the response of the Japanese government (p. 86) and the preemptive measures to avoid future attacks.

In this book, Tu mentions about the Chemical weapons program of India and says that India destroyed its stockpile of 1044 tons of Sulfur Mustard in 2009 as it is a

signatory to Chemical weapon convention. He believes that it is highly unlikely that India is going to use chemical weapons, however, risk of theft or diversion of material by terrorists remains a genuine concern. India established the National Authority for chemical weapon convention which has a primary liaison to OPCW. Till now India has been twice accused of using chemical weapons, once by Pakistan in 1999 and second time by Israr Abbasi, an opposition leader in Azad Kashmir in 2000. India destroyed its chemical weapons after achieving nuclear capability. It is the third country to completely destroy its chemical weapon after South Korea and Albania (p. 161).

Anthony Tu cautions that a state should always be prepared against a chemical or biological attack. He firmly believes that the use of chemical weapons in large quantities can change the outcome of any war; the possession of chemical weapon has a deterrent effect and an analysis of used chemical weapon is important to administer the right antidote (p. 20). He also explains that transportation of chemical weapon can be hazardous and one way to safely transfer it is the use of binary system used by the U.S. He says that strict regulations and legal measures can be helpful in checking the use of the CBW by the state as well as non-state actors. Lastly, he advises that the use of radiation weapons and explosive agent like ammonium nitrate shall not be taken lightly.

To comprehend this book fully, one has to have a certain degree of pre-acquired basic understanding of science. Use of pictures, equations and tables makes it an interesting read while Tu enriches the readers by mentioning various important books on the topic. He has acknowledged the co-author of his third chapter Sayid Abbas Foroutan's contribution who gave him insightful information about Iran-Iraq war and Iran's

covert response. The book has been written in a narrative manner due to which there are avoidable repetitions, for instance, anthrax issue is repeated in p. 34 and 102. It would have been great if it was avoided. However such lucid and honest books are not written every day. This book is truly a delight for the reader who is looking for comprehensive knowledge about CBW.