

biological agent was necessary to produce the toxin. Other types of toxins, such as ricin and saxitoxin, could be extracted from biological materials. Most toxins suffered from the drawback that, to obtain significant amounts (from gram up to kilogram quantities), thousands of kilograms of material had to be processed. Have advances in science and technology changed this to any significant extent?

In 1970, a group of consultant CBW experts to the World Health Organization made the following observations (paraphrased from the Report of a WHO Group of Consultants, 1970. Health Aspects of Chemical and Biological Weapons, World Health Organization, Geneva, p. 26):

- (1) it is unlikely that any substance appreciably more toxic than V-agents had been developed into a practical chemical weapon;
- (2) there exist a large number of animal, plant and bacterial toxins, notably saxitoxin, tetrodotoxin, ricin, abrin and the bacterial toxins from Clostridium botulinum and Cl. tetani;
- (3) most of these are proteins of high molecular weight that are expensive to extract and difficult to disseminate while retaining their toxicity;