

## Book Reviews

**Timothy C Marrs, Robert L Maynard, Frederick R Sidell**, *Chemical warfare agents: toxicology and treatment*, Chichester and New York, John Wiley, 1996, pp. vii, 243, £40.00 (0-471-95994-4).

The large-scale use of chemical warfare agents first occurred during World War I (the “chemists’ war”), and was thereafter repeated at irregular intervals, most recently during the Iran-Iraq conflict of the 1980s. There was consequently a possibility that chemical weapons might be used in the Gulf war. The threat posed by terrorist groups became evident in 1994–95, when Japanese civilians were twice exposed to the nerve agent sarin. Thus, there is clearly a need for effective medical management of injuries caused by chemical agents.

The authors of this book, all experienced toxicologists, present a highly competent and readable synthesis of the scientific and medical literature on the toxicology of the major groups of chemical warfare agents. Detailed descriptions and explanations of mechanisms of action, pathology, and symptoms of poisoning are given. Emphasis has been placed on the practical aspects of treatment—including the difficulties encountered in the field—thereby providing an invaluable guide for civilian and military health care professionals. Historical details about each agent are included throughout.

Readers of *Medical History* may be most interested by the introductory chapter, which provides an overview of the history of the use of chemical weapons and the attempts to prohibit them by international convention. Their relation to ethics and the customary rules of war, and associated arguments, are outlined. Of the few defenders of chemical warfare since 1919, historians of science and medicine will be most familiar with the names of Fritz Haber

and J B S Haldane, who held that chemical weapons were a higher form of killing, possessed of a greater humanity than high explosives and fragmentation devices (p. 1). Public opinion has always been against these weapons, considering them to be particularly unpleasant (p. 15). Indeed, poison has been feared throughout history.

Subsequent chapters treat each group of chemical warfare agents in detail, beginning with a summary of their physicochemical properties and general toxicology; complex information is explained clearly with the aid of tables and figures. Of three chapters devoted to the organophosphate nerve agents (which include sarin, soman, tabun, and VX), one summarizes the history of British and American human studies; the subjects were military volunteers and the occasional victim of accidental exposure.

Chapter Six is devoted to the compound known as mustard gas, sulphur mustard. Its effects as a vesicant are known mainly from World War I and the Iran-Iraq war; western centres treated casualties of the latter in 1986. Of the organic arsenicals developed for use as chemical warfare agents, the most important is lewisite, a non-persistent vesicant. Phosgene acts by damaging the lungs, and was responsible for some 85 per cent of all deaths attributed to chemical weapons during World War I (p. 185). Among the cyanides, the most infamous is hydrogen cyanide, which was used for mass extermination by Nazi Germany (Zyklon B). Finally, riot-control agents are discussed. Their effect is to incapacitate, not kill or severely injure; the best known is CS, a sensory irritant dispersed as a smoke or fog.

Today, more countries than ever possess chemical weapons capability. This book is a reminder of just what that means.

**Katherine D Watson**, Wellcome Institute