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CHAPTER 7

AIR CONDITIONING IN THE PREVENTION AND TREATMENT OF DISEASE

Sanitary Ventilation, Control of Airborne Infection, Value of Air Cooling Under Tropical Conditions, Treatment of Disease, Operating Rooms, Nurseries for Premature Infants, Fever Therapy, Cold Therapy, Allergic Disorders, Oxygen Therapy, General Hospital Air Conditioning

THE Second World War caused an increase of interest in the preventive aspects of air conditioning. It re-emphasized the importance of the control of airborne infection and demonstrated the value of air cooling under tropical conditions for the prevention of heat rash, for promoting proper rest and sleep, and in the convalescence of patients.

The problem of air conditioning or air purification in shelters, hospitals, or any buildings, following an atomic explosion has the attention of engineers, military personnel, public health authorities, private physicians, and the general public. The type and structure of shelters are important. In strategic areas likely to be bombed, they should be windowless, underground, strong enough to resist blast and have sufficient cover to protect against initial radiation. Suitable ventilation is a necessity, and could be provided by the use of pressurized installation in which any air taken from the outside is forced through a ventilator. Air conditioning and heating or cooling systems could then be kept in continuous operation for improving inside air conditions and controlling room temperature. Heat transmission through the walls, carbon dioxide accumulation, and the total number of people using the shelter, are factors in determining the necessity for using outside air. Such a shelter should be closed to outside air during the period immediately following a blast.

A surface or subsurface burst of an atomic bomb would result in a wide dispersion of airborne radioactive particles.[1] Windows of buildings within a three-mile radius from the point of detonation of a 20 KT bomb would be broken, and consequently, any protection however slight, obtainable through the use of conventional air-conditioning systems would not be accomplished. Beyond the three-mile radius many structures may be found with windows undamaged and otherwise capable of providing some degree of protection from airborne radioactive particles by the utilization of an air-conditioning system. However, conventional air-conditioning systems should not be relied upon for such protection in urban structures which may be utilized in the accomplishment of specific missions following an atomic detonation. There are special techniques and devices available which will provide this protection.

The *smog* incident in Donora, Pa., has focused the attention of health authorities and engineers on the problem of air contamination by toxic gases. The exact way in which such substances affect the human being is unknown.[2] There has been a great deal of speculation, but in reality there is little specific information concerning this problem. It is believed that in such cases the combination of contaminants, rather than any single substance, produces the toxic effects. It is known that low atmospheric pressure, with accumulation of toxic substances in increasingly higher