In an investigation recently conducted at the University of Pittsburgh, in a cooperative research program with the Society, comparative studies were made on the bacterial content of conditioned and non-conditioned operating rooms. From these studies[4] it was concluded that the bacterial content of conditioned operating rooms was considerably less than that of non-conditioned rooms. Although this difference may not be great it is sufficient to demonstrate that properly conditioned spaces with adequate filtration can definitely reduce the bacterial and other foreign substance content in an enclosure.

Operations may be postponed on allergic patients during asthmatic manifestations through fear of complications. The removal of air borne allergens, therefore, is in some cases an important function of the air conditioning system in preparing patients for operation.

Central system air conditioning plants and unit air conditioners prove satisfactory in operating rooms when producing between 8 and 15 air changes per hour of filtered and properly conditioned air without recirculation during the course of anesthesia. A separate exhaust fan system is as a rule necessary to confine and remove the gases and odors. Double windows are desirable and often necessary to prevent condensation and frosting on the glass in cold weather and to minimize drafts. The high air flow of 8 to 15 air changes in operating rooms is desirable for three reasons: (1) to reduce the concentration of the anesthetic to well below the physiologic threshold in the vicinity of the operating personnel, (2) to remove the great amounts of heat and sometimes moisture, from sterilizing equipment if inside the operating room, from the powerful surgical lights, from solar heat, and from the bodies of the operatives, and (3) to provide extra capacity for quickly preparing the room for emergency operations. Much can be gained by careful insulation of sterilizing equipment and by thorough exhaust ventilation of sterilizing rooms adjoining the operating rooms.

A very common complication presumably traceable to operations is pneumonia. The difference in conditions between the operating room and the final hospital destination of the patient, including corridors and elevators, is conducive to post-operative pneumonia. A suggested remedy is a recovery ward where conditions closely approximate those of the operating room and in which the patients remain from one to four days. Satisfactory conditions in the recovery ward not only hasten convalescence, but dispel the fear frequently found in patients who must undergo operations during the hot seasons[5].

Sterilization of Air in Operating Room

Of considerable significance to operating rooms and contagious wards is the use of ultra-violet radiation for sterilizing the air[6]. Results reported[7] would indicate that the post-operative temperature rise of patients

[4]Report on Air Conditioning in Surgery, by W. Leigh Cook, Jr. (Department of Industrial Hygiene, School of Medicine, University of Pittsburgh, 1940).

[5]Report of the Committee on Air Conditioning (*The American Hospital Association*, 1937, p. 2).

[6]Air-Borne Infection and Sanitary Air Control, by W. F. Wells (*Journal Industrial Hygiene*, 17:253 1925).

[7]Sterilization of the Air in the Operating Room by Special Bactericidal Radiant Energy, by Deryl Hart (*Journal Thoracic Surgery*, 6:45, 1936).

during the first few days is in most instances caused more by bacterial contamination of the operative wound than by the absorption of blood and traumatized tissues. Operating room infections, which were quite frequent before the installation of special ultra-violet lamps, are apparently being reduced.

Direct ultra-violet radiation is distinctly advantageous in sterilizing not only the site of operation but also wounds to prevent the spread of infection. In infants' wards, contagious disease wards, and even in school rooms, the sterilizing effects are definitely known. Whether an air conditioning system with ultra-violet installations in the ducts is a feasible procedure is controversial; but it would appear that this indirect method is not as satisfactory as the direct in the light of present reported knowledge.

TABLE 3. NET MORTALITY OF PREMATURE INFANTS ACCORDING TO HUMIDITY[a]
Infants Hospital, Boston, Mass.

CAUSE OF DEATH	UNCONDITIONED NURSERIES (1923-1925)	CONDITIONED NURSERIES (1926-1929)	
	NATURAL HUMIDITY	RELATIVE HUMIDITY	
		25-49 Per Cent	50-75 Per Cent
	Per Cent Mortality	Per Cent Mortality	Per Cent Mortality
Acute and chronic infections	26.5	9.7	0.0
Congenital deformities	1.2	0.0	0.7
Unclassified	1.2	4.8	0.0
All causes	28.9	14.5	0.7

[a]Excluding cases with multiple congenital anomalies incompatible with life, and also deaths occurring within 48 hours after admission to the hospital.

NURSERIES FOR PREMATURE INFANTS

One of the most important requirements in the care of premature infants is the stabilization of body temperature. This is because their heat regulating systems are not fully developed; the metabolism is low and the infants generally exhibit marked inability to maintain normal body temperatures. The resistance to infection is low and mortality rate high.

Air Conditioning Requirements

The optimum air conditions for the growth and development of these infants were determined by extensive research[8] at the Infants Hospital, Boston, Mass., using four valid criteria, namely, stability of body temperature, gain in weight, incidence of digestive syndromes, and mortality. Individual temperature requirements varied widely (from 72 to

[8]The Premature Infant: A Study of the Effects of Atmospheric Conditions on Growth and on Development, by K. D. Blackfan, C. P. Yaglou and K. McKenzie (*American Journal Diseases of Children*, 46: 1175, 1933).