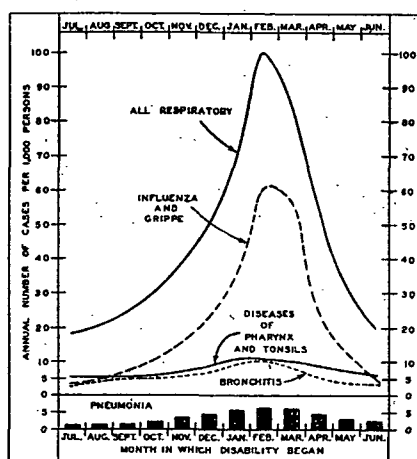


in this probable infection chain has been demonstrated to be the reintroduction of particles into the air⁴.

Intensive studies on air disinfection have indicated two distinct control measures, (a) suppression of dust and lint, and (b) disinfection of droplet-nuclei.

Well controlled, large scale tests of the various methods of air sterilization conducted in barracks^{4, 5} have confirmed the importance of dust control in minimizing the spread of airborne disease, a consideration which has guided the practices of ventilating engineers for a number of years. The importance of the dust factor has been emphasized by many engineers and



Occurrence of diseases causing disability for 8 consecutive days or longer in a group of 100,000 wage earners (10 per cent women) in different industries.

* Graph obtained from Dean K. Brundage, U. S. Public Health Service.

FIG. 1. STUDY OF AVERAGE MONTHLY FREQUENCY (1921-1926 INCLUSIVE) OF SPECIFIED RESPIRATORY DISEASES*

has been convincingly demonstrated by subsequent bacteriologic studies aboard ships.

Treatment of floors and bedclothes with oil emulsions has proved effective in reducing bacterial dispersion by as much as 90 per cent in Army barracks and station hospitals⁶. The incidence of acute respiratory infections was from 10 to 30 per cent lower in barracks with oiled floors and bedclothes than it was in control barracks which received no special treatment. More recent studies, however, have yielded inconsistent results.

An emulsifying mixture, *Fixanol C* containing cetyl pyridinium bromide, when incorporated in the oil-in-water emulsion imparted a bactericidal action to the emulsion. Blankets treated with this substance and oil became bactericidal and retained this property for as long as three months. The possibility of hypersensitivity of an occasional individual to bromide

drugs should be borne in mind when exposing large groups to treated garments or blankets⁷.

No simple method for disinfecting droplet-nuclei has yet been devised. Under favorable laboratory conditions, propylene glycol in concentrations of 0.07 to 0.14 milligrams per liter, and triethylene glycol in a concentration of 0.0045 milligrams per liter were highly germicidal for most airborne bacteria in clean air when the relative humidity was between 40 and 60 per cent^{6, 7, 8}. Apparatus for the production of glycol vapor and an independent duct system for carrying this vapor and diluting air for large rooms or spaces and unit type vaporizers for small spaces have been described recently⁹. There is also available a device for the automatic regulation of glycol vapor in the air called the glycostat. This instrument has been calibrated to measure the degrees of saturation of the air with glycol vapor by direct reading of the variations in the intensity of light reflected from the glycol condensing surface of the wheel of the instrument¹⁰. Under

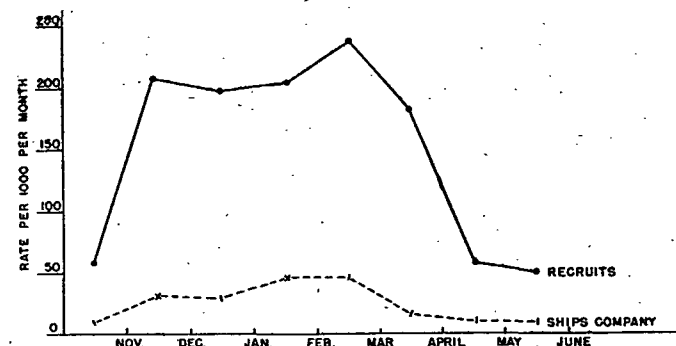


FIG. 2. MONTHLY INCIDENCE OF ACUTE RESPIRATORY ILLNESS AMONG NAVAL RECRUITS AND SHIP'S COMPANY (PERMANENT PERSONNEL)¹

practical conditions, however, particularly in the presence of dust in the air, glycol effectiveness is much reduced. The use of other chemical aerosols that have been tried is limited by their toxicity, odor, or destructiveness to fabrics and metals.

Ultraviolet radiation of floors and upper air has been studied extensively at the Naval Training Center, Sampson, N. Y. In barracks housing naval recruits, hospital admissions for respiratory infections (mostly *catarrhal fever*) were 25 per cent lower in a group of men exposed to ultraviolet radiation—(2537 Angstrom Units, 1 to 7 ergs per (cm²) (sec) at bed level)—than they were in adjacent control barracks without ultraviolet radiation¹¹. Sources of ultra violet radiation should be so situated as to protect the eyes of the occupants of the room from direct or reflected rays. A combination of ultraviolet radiation and dust control measures is believed