

Bacteria Raise Deaths

► THE MOST IMPORTANT CAUSES of severe infection and death in hospitals today are antibiotic-resistant bacteria. These now top the previously more fatal pneumonia bacteria and strep-infection type bacteria that proved susceptible to antibiotics.

In Boston City Hospital in 1935, antibiotic resistant *Staphylococcus aureus*, which causes boils, carbuncles and other inflammations, accounted for one of every five cases of infection and less than one of every five cases of death from bacteria-caused infections.

In 1957, it accounted for two-fifths of both infections and deaths, Dr. Maxwell Finland, associate professor of medicine at the Harvard Medical School and physician-

in-chief of the Fourth Medical Service of Boston City Hospital, reports in the New England Journal of Medicine, 263:207, 1960.

Dr. Finland says that reliance on antibiotics may be responsible for increasing laxity in application of strict aseptic methods for avoiding infection and cross-infections in surgery, nurseries and general wards in which infections are being treated. This laxity, he says, "is undoubtedly a major contributing factor," to the rise in staph incidence and fatality.

No remedies for stemming the continuing rise of staph deaths have yet been demonstrated "to produce any lasting salutary effect," says Dr. Finland.

• Science News Letter, 78:111 August 13, 1960

INVENTIONS

Jet Deflector Patented

► A MEANS OF DEFLECTING the thrust of a jet engine downward and the first commercial process for making diamonds have been patented.

John Avery Flint of Farnborough, England, was awarded patent No. 2,947,501 for "a deflecting device located in the jet nozzle unit of a jet propelled aircraft for diverting the jet from a rearwardly directed nozzle into a downwardly directed nozzle." He assigned his invention to Power Jets Ltd. of London.

The patent calls for a normal horizontal jet duct with a second duct of the same diameter branching down from it at an angle of about 60 degrees. Two "butterfly valves"—circular plates hinged across a diameter or elliptical plates hinged at both ends of either the major or the minor axis—operate together so that when one nozzle is open the other is closed. Both valve plates are curved so that when positioned to provide a downward thrust they provide a smooth curve rather than an abrupt change in direction.

The purpose of the device is to increase the vertical thrust at the expense of the forward thrust. Planes using this device may require less runway in take-off. The device may make it possible for larger aircraft to be used on aircraft carriers and for planes to pull out of dives more abruptly.

Four patents, all assigned to General Electric, covered the preparation of diamonds from other forms of carbon. General Electric was first successful in developing a process for the commercial production of diamonds more than five years ago, but details were secret until late last year.

Patent No. 2,947,610, awarded to Howard Tracy Hall of Provo, Utah, and Herbert M. Strong and Robert H. Wentorf Jr., both of Schenectady, N. Y., and assigned to General Electric, was one of the four mentioned and describes how carbon may be converted to diamond by the action of heat and pressure in the presence of certain metallic catalysts.

Pressures of more than 75,000 atmospheres

and temperatures of between 1,200 and 2,000 degrees centigrade may be used, the best results being obtained at about 95,000 atmospheres and between 1,400 and 1,800 degrees centigrade. The eleven metals listed as catalysts for the process include iron, nickel, cobalt, chromium and manganese.

The apparatus used to achieve these conditions consists basically of a doughnut-shaped ring and two conical pistons. The reaction mixture is placed in the center of the ring and the two pistons, one above and one below the ring, are compressed. The unit is heated electrically.

U. S. industry uses more than two tons of diamonds every year for cutting, grinding and polishing, and was completely dependent on external sources of natural diamonds before General Electric started marketing synthetic diamonds in 1957. These man-made diamonds are not of gem quality.

A patent was also issued for a means of making flavored cigars or cigarettes. They can produce two different flavors.

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CHEMISTRY

Chemical Process Can Shrink Wool Fibers

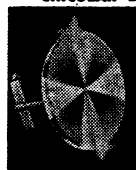
► A CHEMICAL TREATMENT that shinks wool fibers may be the basis for improved manufacture of wool felts, according to the U. S. Department of Agriculture. Dimethyl sulfoxide, an inexpensive, commercially available liquid, shortens fibers by rearrangement of wool molecules and thus effects a permanent hardening and toughening of the felt. Relative hardness of the felt can be controlled both by the length of time the felt is left in the solution and the temperature of the bath. Aim of the improved process is to lower the cost of felt manufacture by reducing the amount of mechanical beating now required to harden felts.

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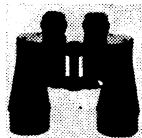
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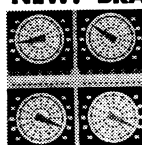
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