MEDICINE

Virus May Cause Cancer

Also being studied are the possible relation of diet to cancer and the effect of spleen tissue on cancer. Successful control now held more likely.

➤ HOPE of success in controlling cancer "within a reasonable time" is held by scientists at the Clayton Biochemical Institute of the University of Texas.

Evidence from their studies tending to show cancer is caused by a virus or virus-like substance is the basis for this hope. At the same time, the Institute is not neglecting other avenues of approach to the problem, including the dietary one. A long-range research program is under way, Dr. Roger J. Williams, director, states in the second report of the Institute's cancer studies.

The virus theory is based on work by Dr. Alfred Taylor and associates. They have been able to produce breast cancers in mice with a virus-like material obtained from the yolk-sacs of chick embryos previously inoculated with extracts of mouse cancer tissue. After the cancer tissue had been growing on the yolk-sacs for a time, the yolk, cancer, blood and fluids of the egg were treated in various ways, including filtration through a fine filter, to remove all cancer and other cells. Only a virus is small enough among living organisms to go through such a filter. Consequently when healthy mice developed cancers after injection of this material, the scientists felt certain it was a virus that caused the cancer.

Latest efforts have been to develop methods for obtaining this cancer-producing material such that the results can always be duplicated and then to develop methods for studying the virus. If this research shows that the cause of cancer is a virus, there is hope that methods of controlling it can be discovered.

Still in the early stages are the studies of the possible relation of diet to cancer and of the effect of spleen tissue on cancer. Spleen cells, Dr. R. E. Hungate and Miss Hester Snider find, always show a tendency to slow or check the growth of cancers in eggs. This finding which supports that of other scientists is considered important because it emphasizes a technique with which a killing of cancer cells by other cells can be studied.

Science News Letter, June 2, 1945

MEDICINE

Pneumonic Plague Remedy

Sulfadiazine treatment is credited in part for the recovery of one patient. Thiouracil helped seven out of 10 with angina pectoris.

➤ NEW SUCCESSES in treating pneumonic plague, heart disease and psittacosis are reported in the *Journal of the American Medical Association* (May 26), which also reports success with penicillin treatment of neurosyphilis.

Thiouracil, a chemical which suppresses the thyroid gland hormone, helped seven out of 10 patients with angina pectoris, Dr. Wilhelm Raab, of the University of Vermont College of Medicine, reports.

Symptoms were completely relieved in four of the patients during treatment. One was only slightly improved, while two were not helped and died. The treatment is effective in the same way that removal of the thyroid gland helps some patients with angina pectoris. It has the advantage of not involving a major surgical operation. The thyroid hormone, Dr. Raab believes, sensitizes the heart muscle to the oxygen-depriving toxic action of epinephrine, one of the adrenal gland hormones. When the thyroid is removed by operation or suppressed by thiouracil, the heart is protected.

Sulfadiazine treatment is credited in part for the recovery of the pneumonic plague patient. He was a physician engaged in plague research with the U. S. Public Health Service, in the course of which he contracted the disease. No one knows how this accident occurred.

He suffered from the pneumonic form of the disease. Recovery from this is so rare "that for all practical purposes the disease is considered fatal," Dr. Edgar J. Munter, U. S. Public Health Service, points out in his report.

The disease was recognized within 26 hours after its start and treatment started at once. The patient had had a large amount of plague vaccine the year before. This, plus the modern treatment facilities and excellent nursing, probably played a part in his recovery. The disease did not spread to anyone else.

Penicillin, previously found effective in protecting laboratory mice against psittacosis, is credited with helping a human patient to recover in the case reported by Drs. Harrison F. Flippin, Michael J. Gaydosh and William V. Fittipoldi, of Philadelphia.

Science News Letter, June 2, 1945

PUBLIC HEALTH

Cases of "Diaper Rash" Traced to New Antiseptic

➤ FIVE cases of "diaper rash" have been traced to a new antiseptic solution used by a diaper service, Dr. William L. Dobes, of Atlanta, Ga., has reported. (*Journal, American Medical Association,* May 26)

The solution, marketed under a trade-name, was used as the final rinse by the diaper service. The company making the rinse claims, Dr. Dobe states, "that its purpose is to make textiles actively antiseptic as a protection to persons and as a prevention of destruction of textiles by bacteria, germs, mold and mildew."

The chemical is "a primary skin irritant in strong concentration and a sensitizer in weak concentrations," a U. S. Public Health Service official informed Dr. Dobes.

A commercial testing company has reported testing samples of cotton fabric treated with the chemical. No irritated areas developed on any person on whose skin these samples were placed for 48 hours, removed for 24 hours and replaced for another 48 hours.

Dr. Dobes made the same kind of test on one of his patients with one of the diapers treated with a much weaker solution of the chemical. The test was positive after 24 hours.

When mothers of babies who had the diaper rash used their own diapers instead of those from the diaper service, the rash cleared up in three to seven days. It came back immediately when the babies started wearing diapers from the diaper service.

The diaper service was very coopera-

tive and because of the potential dangers, omitted the rinse. The babies got over the rash and have not had any more although the same diaper service is being used. The fact that the antiseptic solution is the only ingredient omitted by the laundry confirms the diagnosis that it was the cause of the trouble.

Science News Letter, June 2, 1945

OPTICS-PHOTOGRAPHY

Better Photos After Dark

New developments in optical science cut lens reflection. Will mean better photographs will be possible under poor light conditions.

➤ LENSES and glass produced by the American optical industry today by mass production methods are equal to or superior to the best hand-made items produced by German craftsmen, who were long considered leaders in the field. Many important developments that have made this record possible stem from research carried out by scientists at the Frankford Arsenal in Philadelphia, where high-school girls produce lenses and prisms for intricate gunsights, periscopes, and bombsights with speed and precision that is the envy of optical artisans.

From the cutting of the lens blank, through the rough grinding, fine grinding and polishing stages, all of the work is done by machines. With the active cooperation of industry, machines that were never meant to see the inside of an optical shop are speeding the production of lenses. Blanchard machines, used to cut, grind and polish metal, are employed to rough out lens blanks. A curve generator, with a mechanical arm that replaces the human arm, rough-grinds the lens blanks to tolerances of less than one millimeter. Over 60 different kinds of abrasives are used in the grinding of precision lenses. These range from coarse abrasives of synthetic aluminum oxide or silicon carbide in particles as large as 290 microns (one micron equals one-thousandth of a millimeter) down to fine abrasives only five microns in size. One of the fine abrasives used is made from domestic garnets. Enough rouge is used yearly on just one of several dozen lens-polishing machines to supply about 11,000 women with their cosmetic requirements for a year.

As a standard procedure, all lenses manufactured at Frankford Arsenal must be coated with a thin film of magnesium fluoride before being installed in instruments. This coating increases the transmission of light through the lens by 25%, through reducing reflection. This means increased visibility at all times, and particularly at dusk. It extends the good hunting time for our armed forces at least one-half hour at dusk. Since the magnesium fluoride coating permits more light to reach the eye, it will have many postwar uses in spectacles, microscopes and camera lenses. Glass coated with the metal is easier to keep clean, and fingermarks do not show up on it.

Lenses to be coated are mounted in a hemisphere-shaped rack which is suspended inside a large glass cylinder above a crucible cup containing finely powdered magnesium fluoride. The air is exhausted from the cylinder, leaving a nearly complete vacuum. Then a tungsten filament above the crucible cup is turned on and heated to a high temperature. The heat causes the magnesium fluoride to evaporate and condense on the lens surface, leaving a thin, almost invisible, film less than a millionth of a millimeter thick. The process takes about one hour to complete.

By depositing several magnesium fluoride films, one on top of the other, it is possible to increase reflection instead of cutting it down. This discovery may lead to new types of mirrors with the reflecting surface facing out, instead of into the glass.

For years, balsam, an oily, fragrant resin, has been used to seal parts of lenses together. However, since lenses sealed with it would not stand up in the extremely low temperatures encountered in high-altitude flying, or in the heat of a Pacific atoll, a new substitute had to be found. Men from the optical laboratory here went in search of a substitute and came up with new thermal setting cements. The one in use at Frankford Arsenal today is known as CR-39, which looks like kerosene when cool, but becomes a jelly when heated. The formula for this synthetic resin cannot be revealed at present. The other usable cement is a resin containing butyl methacrylate.

In using these cements, the lenses are pre-heated, the cement applied, and then the lenses are baked in an electric oven at about 200 degrees Fahrenheit for as long as 2½ hours. Although balsam is easier to use and dries in 15 minutes, the properties of the new thermal-setting cements make them more desirable for general use.

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A good *queen bee* lays from 2000 to 3000 eggs a day.

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