MEDICINE

Body Fights Germs Harder In Winter Than Summer

Report Finding of Chemical Important in Body's Fight Against Disease; Killing of Cancer Cells Explained

THE BODY puts up a stiffer fight against invading disease germs in winter than in summer.

This discovery, accidentally made from observation of the marks of the battle on the brain tissues of mice that had encephalitis, was reported by Drs. R. D. Lillie, R. E. Dyer, Charles Armstrong and Joseph G. Pasternack of the U. S. National Institute of Health, Washington, to the meeting of the American Association of Pathologists and Bacteriologists in Chicago.

Whether the fiercer fighting in cold weather means that the body is more successful in resisting germ invasion is not yet known. That is the next problem for investigation. Meanwhile the discovery reported here gives an entirely new explanation for the old idea of a relation between climate and infectious disease.

Climate does not affect infection or transmission of disease, but exerts its influence on the internal or tissue reactions of infected animals to disease, Dr. Lillie and associates explained. These reactions, termed inflammatory changes, are part of the body's defense mechanism.

At warm temperatures, apparently, the standing army of defensive antibodies in the blood stream are sufficient to fight invading disease germs, Dr. Lillie suggested as a tentative explanation of the findings. When the temperature gets low, the reserves are called out, and these are the mechanisms within the body's cells which produce inflammation when they go into action.

Brains of Mice

Brains of mice that had encephalitis of the type epidemic in St. Louis in 1933 and 1934 gave the first hint that temperature affected the body's defense mechanism. The research had started in the winter and the reaction to the infection seen in the mice brains was graded severe, moderate and slight. As the seasons changed, fewer moderate and severe reactions were noted and in summer even slight reactions were few. In August the severe and moderate reactions began to increase again.

The evident relation to temperature suggested further studies, which were made with "hot" and "cold" mice infected with encephalitis and with guinea pigs infected with typhus fever and kept at varying temperatures.

Discovers Chemical

A chemical, tentatively named leukotaxine, which plays an important part in the body's fight against disease, has been discovered by Dr. Valy Menkin, of Harvard Medical School.

Reporting to the meeting of pathologists and bacteriologists, Dr. Menkin said that the chemical is produced by injured cells of the body but not by normal cells; that it causes increased leakage of fluid from small blood vessels, seen as the swelling in inflamed tissues; that it causes migration of fighting white blood cells to the point of injury; that it is a crystalline, water-soluble substance, as yet unidentified chemically.

No Danger

Encouragement for those who use benzedrine sulfate to decongest their noses during a cold appears in the studies reported by Drs. W. E. Ehrich and E. B. Krumbhaar of Philadelphia. These studies show the drug has a wide range of safety.

This chemical, or the similar benzedrine hydrochloride has other uses besides decongestion of nose, throat and ears. It is like adrenalin and ephedrine, and like them increases the blood pressure. Benzedrine, however, generally works more slowly and longer than ephedrine and adrenalin. It is said also to stimulate the brain, both in causing excitement, preventing sleep, relieving fatigue or narcoleptic (sleepy attacks) symptoms and shortening anesthesia from amytal.

Experimental studies have lagged behind the clinical use of this important drug, and the Philadelphia scientists undertook to determine the safety limits of the drug and whether its continued use would have any bad effects. Working with rats, they found that even when given over long periods, the drug

DATES WEAR RAINCOATS

Not good-looking young fellows in slickers. Just big clusters of the California palm-fruits covered with little individual tents of tough waxed paper to keep off dew and drops from any untimely shower that might fall during the ripening period. Even an almost microscopic wetting might cause the spoilage of a fifty-pound cluster of dates.

produced no harmful structural changes in the internal organs. Doses from ten to hundreds of times the medicinal dose produced little more than an exaggeration of the remedial effect, and had no lasting ill effects.

Fatal Transformation

Like the good fairy who changed the dreadful ogre into stone, X-rays destroy certain kinds of cancer cells by transforming them into abnormal cells with calcified or stony nuclei.

The fatal transformation of cancer cells by X-rays was described by Drs. Perry J. Melnick and Albert Bachem of Chicago.

The transformation is known scientifically as a mutation or variation. It has been known for some time that X-rays could cause mutations in plants and animals, but it remained for Drs. Perry and Bachem to discover that this is one of the ways in which X-rays cure cancer.

With large single doses of X-rays, suitable for treatment of certain tumors, the tumor or cancer cells disintegrate by dying. However, with small repeated doses of X-rays, a method suitable for certain other types of tumors, the X-rays induce changes in the tumor cells resembling lethal mutations.

"The cells," the Chicago scientists explained, "are transformed into abnormal forms which are unable to survive. In a series of rat tumors, the tumor cells were transformed by X-rays into abnormal giant cells which disintegrated in a specific manner by calcification of their nuclei."

Won't Cause Cancer

Dusty air, such as miners, stone cutters and many others work in all day long, is a health hazard and may cause diseases like silicosis, but it is probably not in this country a cause of lung cancer.

This is the conclusion of a study reported by Drs. Arthur J. Vorwald and John Karr of Saranac Laboratory, Saranac Lake, N. Y.

The tendency to regard inhaled dust as a cause of lung cancer was prompted, Drs. Vorwald and Karr pointed out, by reports from mining districts in Europe. The number of cases of cancer among miners there is unusually high. The ore dust in these mines is radioactive and therefore induces changes in the lungs which eventually develop into cancer.

These observations do not justify incriminating all dusts as cancer-causing. The great majority of the dusts are not radioactive, the Saranac scientists pointed out, and do not, so far as is known, contain cancer producing substances. If they did, the amount of lung cancer in men and experimental animals exposed to occupational dusts for long periods of time should be unusually high. A survey of patients suffering from pneumonokoniosis, the lung condition that is due to breathing dusty air, and observations on patients and animals at the Saranac Laboratory, Drs. Vorwald and Karr say, do not support this view.

Pneumonokoniosis itself, however, is one of the important occupational hazards in many industries throughout the country. Silicosis is one form of pneumonokoniosis, due to inhaling dust containing particles of silica. Few persons die of pneumonokoniosis or silicosis, but these conditions make the sufferer more liable to develop tuberculosis or other lung infections.

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BALLISTICS

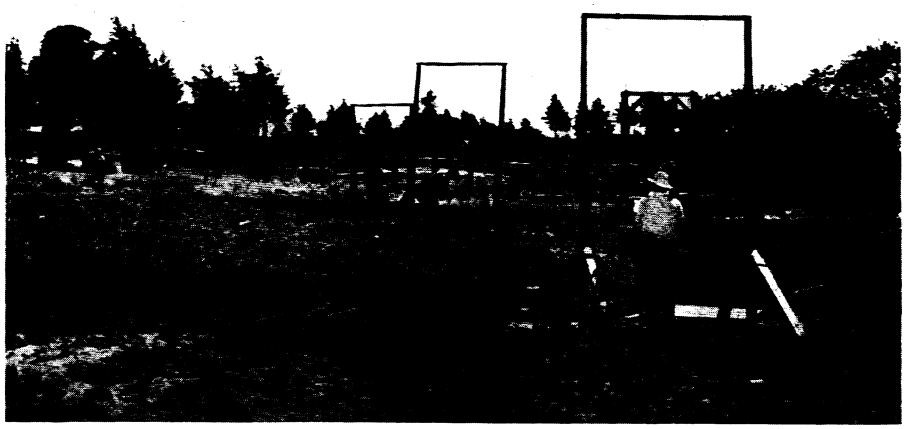
Determine Speed of Shells By Firing Through Light

Series of Light Beams Are Intersected by Projectile, Progress of Which is Recorded by Photoelectric Cells

AN ARTILLERY shell crashing through invisible curtains of light is the newest means of determining the speed of projectiles developed by scientists at the National Research Laboratories of Canada in Ottawa. Particular merit of the system is its portability which enables it to be used in the field, to bring added accuracy to computations of range in actual combat.

Light beams, mirrors, photoelectric cells and sensitive recording mechanism are the equipment which makes possible the new development of Dr. D. C. Rose, physicist in the division of physics and electrical engineering of the Canadian National Research Laboratories.

In effect the artillery shell passes down a narrow tunnel and every 50 feet intersects a beam of light falling on a photocell. Momentarily the shell blocks off the light beam and this decrease in light intensity cuts down the electrical output of the cell. By an amplifying system this electrical change produces a permanent record on photographic film.



MEASURING SPEED OF SHELLS

Dr. D. C. Rose, National Research Laboratories of Canada, supervising the installation of his photoelectric device. A light beam from the small box at the bottom of the frame is reflected and falls on the photoelectric cell at top of frame.