

MEDICINE

# Transform Cells in Test Tube By Cancer-Causing Chemical

## Experiments Indicate That Carcinogenic Chemicals Act Directly on Cells, Independent of General Body Action

**P**ROBING for the secret of how normal healthy cells in a human body are transformed by a chemical into malignant cancer cells, Drs. Wilton R. Earle and Carl Voegtlin, of the National Cancer Institute, U. S. Public Health Service, have achieved the test tube transformation of one type of living cell into what appears as a radically altered type. (*Public Health Reports*, Feb. 23)

Whether their cellular alchemy has created cancer cells out of normal cells remains to be proved. The new cells, however, have at least many of the appearances and characteristics of cancer cells.

This transformation is important scientifically because it is the first time it has ever been accomplished, outside the body, with mammalian cells, such as humans have.

The new type of cells were produced by growing mouse cells in flasks and treating them with methylcholanthrene. This substance is a powerful coal tar chemical which causes cancer when in-

jected into or rubbed on the skins of mice or other laboratory animals. It is similar to the substance in coal tar which causes the kind of human cancer known as chimney sweepers' and spinners' cancer.

Since the cells that were transformed by the chemical were outside the animal's body, the experiments show that the chemical probably causes cancer by direct action on the cells, independent of any general systemic action. In other words the chemical causes cancer by its own contact with the cells and not by indirectly producing changes in general body chemistry which in turn might cause cells to become cancerous.

Significant feature of the transformation of normal mouse cells into this type is the fact that the chief changes so far observed in the cells seem to suggest changes in the cell membrane or envelope. It is suggested that this might be a crucial change in the transformation of a normal cell into a cancerous one by chemical treatment.

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# Cancer Conquest May Be Triumph of Machine Age

**C**ANCER, Number Two Killer of mankind, may be mowed down by the mechanical developments of the machine age we are now living in. This picture of the conquest of cancer being added to the annihilation of time and space by man-made machines appears in a review of latest cancer developments announced by the American Society for the Control of Cancer.

The two latest developments in treatment of cancer patients are neutron rays from one of the hugest of machines, the cyclotron, and the refrigeration treatment in which air-conditioning machines are now used to maintain the low temperatures. The verdict of the American

Society for the Control of Cancer on the refrigeration or frozen sleep treatment is that cancer pain is temporarily alleviated but that vigorous cancer cells are unlikely to be killed by it.

On neutron ray treatment, the Society's verdict is more hopeful, although it indicates more time is needed to determine the cancer-curing value of this treatment. High speed neutron rays are not expected to give much better results in curing cancer than high voltage X-rays, but there is a possibility of capturing the slow neutron rays and putting them as well as the fast ones to work at destroying a cancer. A recent report of attempts to do this by injecting boric

acid into the tumor or cancer, to capture the slow neutrons, makes it appear "probable that some method based on this principle will prove of practical value in treatment of cancer, with high speed neutrons."

X-rays themselves, already serving valiantly as cancer destroyers in some cases, may also be considered a machine age development. Radium, another of the Big Three that are curing cancer today, is a chemical element rather than a machine, but it can truly be called a machine age discovery. Oldest of the Big Three for cancer treatment is the surgeon's knife. Surgery was practised in prehistoric times, but the modern surgeon's healing scalpel is a machine age product.

These machine age developments for cancer conquest are directed toward treatment of cancer patients. For prevention of cancer, scientists have turned to chemistry, genetics, and the study of races, skin color, sunlight and food. Much knowledge has been won, the Society's report indicates, but the twin puzzles of what causes cancer and how it can be prevented have not yet been completely solved.

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## Free Cancer Treatment Made More Available

**M**ORE free treatment for cancer sufferers will be available as a result of the reorganization of the American Society for the Control of Cancer.

Teaching people to be on the look-out for cancer signs, and to seek early diagnosis and treatment by one of the three accepted methods, surgery, X-rays and radium, has been the chief job of the Society so far. The time has now come, Dr. C. C. Little, managing director, explained, for the Society to assist people to put its teachings into practise.

Through its reorganization the Society will be in a position to aid indigent patients to get and pay for cancer treatment from accredited physicians. It or its auxiliary body, the Women's Field Army, will also be able to establish and maintain cancer clinics, hospitals, or laboratories. The Society will not, however, treat patients or operate the hospitals or clinics. Its activities will be limited to financing and organizing such institutions.

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An owl turns its head to stare because its eyes are directed forward.