GENERAL SCIENCE

Virus Destroys Cancer

Human cancer given to rat completely obliterated by injection of Coxsackie virus, National Academy of Sciences autumn meeting told.

➤ COMPLETE OBLITERATION of a human cancer by a virus has been achieved, scientists of the National Institutes of Health, Bethesda, Md., reported at the National Academy of Sciences meeting held at the Institutes.

The cancer had been taken from a patient, cultivated in flasks in the laboratory and then put into a rat. There it grew to large size. Then Coxsackie virus was injected.

At first there was very little change in the cancer, but when the virus was extracted from this cancer and injected into the human cancer in another rat, and this was repeated five or six times, the virus was able to wipe out completely the growing human cancer in the rat.

This enhanced virus has not yet been tried on human cancers in human patients. The scientists hope to try this next.

Coxsackie virus causes mild sickness in humans. The sickness has sometimes been confused with non-paralytic polio. It may make the cancer patients sick, with a headache and pain in the chest, for a few days, if and when it is given them.

However, this "calculated risk" is considered worth taking in the hope of wiping out the cancer. Except for newborn infants, no deaths have been reported due to Coxsackie virus.

Scientists who reported the work with Coxsackie virus against cancer are Drs. R. J. Huebner, R. R. Smith, W. P. Rowe, R. G. Suskind and R. Love.

Previously they had reported that one of the adenoviruses, which cause illness like severe colds after growing on human cancer cells outside the body, could destroy cancers in patients.

"Definite, sometimes extensive local destruction" of the cancer tissue was achieved in 40 patients. No destruction of normal tissue could be seen and there were minimal side effects.

The effects, however, were not complete, as they were with the Coxsackie virus against the human cancer in rats. In no case were the results with the adenovirus "curative."

Deep Earth "Minerals"

➤ NEW "MINERALS" that may exist under pressures of a million pounds per square inch and high temperatures more than a hundred miles beneath the surface of the earth have been made at the Geophysical Laboratory of the Carnegie Institution of Washington.

Dr. F. R. Boyd, Carnegie Institution physical chemist, told the meeting how the rigorous conditions deep beneath the earth are imitated in his laboratory.

Unless in the future it is possible to drill to such great depths as more than a hundred miles, man will never see these silicates if they are formed in nature under high pressure.

Three or four new high-pressure phases, as the man-made rock compounds are called, have been discovered in these investigations. The term "mineral" is reserved for chemical compounds occurring naturally in the earth's crust.

Dr. Boyd suggested that changes in the transmission of earthquake waves in the earth's crust, which are called discontinuities, such as occur at the base of the earth's crust and in the upper part of the earth's mantle, may be explained by transitions from one mineral phase to another.

Cells Live Minus Nuclei

➤ HUMAN CELLS can continue to live and carry on many functions, even after their nuclei have been removed surgically.

The first demonstration of this ability was reported by Drs. T. Timothy Crocker, Lester Goldstein and Relda Cailleau of the University of California Medical Center, San Francisco.

In earlier experiments, larger and more primitive cells, such as amoeba and sea-urchin eggs, were kept alive for some time after removal of their nuclei, but this had not been achieved in the much smaller, specialized cells of mammalian tissue.

Human Hela cancer cells were used. They are only about one-thousandth of an inch in diameter, and are believed to be the smallest cells yet subjected to microsurgical techniques.

The "operation," performed under a microscope, with microscopic-sized knives and manipulators, actually consisted of cutting the dumbbell-shaped cells in two.

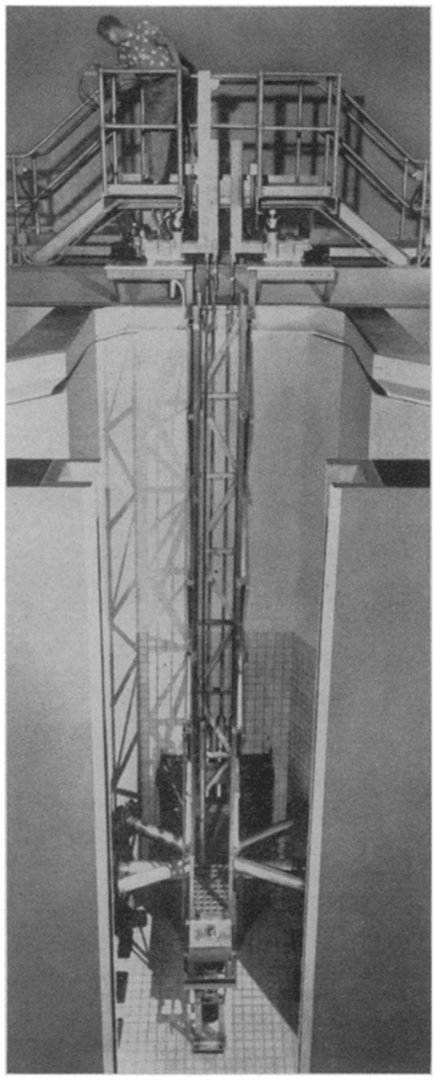
One part contained the nucleus, which governs reproduction, heredity and other important cell activity. The other part contained only cytoplasm, material that forms the main body of the cell, assimilates food and carries out activities directed by the nucleus.

Time-lapse motion pictures showed the cell parts without nuclei healed at the point of cut, retained apparently normal cytoplasmic structure, and survived for as much as 40 hours.

The edges continued to show the slight, rhythmic motions characteristic of feeding, and the cytoplasm continued to move about in the tissue culture medium like intact cells. The cytoplasm fragments abruptly shriveled and became immobile after varying periods of survival. There was no reproduction among the fragments. This is a function of the nucleus.

The work is important in understanding the function of individual cells, the basic units of life. It may ultimately be important in understanding cancer and other biological problems.

The scientists now want to know what mechanisms enable the cytoplasm to survive without a nucleus, and what independ-



TALL TOWER—The core of the reactor Battelle Memorial Institute now operates is located at the bottom of this suspension tower. When sufficient fuel elements are in their proper positions, fission produces gamma rays and neutrons for use in research. Tubes entering from the sides of the pool have samples for irradiation inside them when the reactor is operating.