



Bionetics Research Laboratories

PROTECTED BABY—A baby rhesus monkey housed in a germ-free incubator is being fed by a nurse at the Bionetics Research Laboratories, Inc., Falls Church, Va., where studies on leukemia are being carried out in cooperation with the National Cancer Institute. More than a thousand primates are kept at these laboratories for various research purposes.

PHYSIOLOGY

Odor Identifies Disease

► SCIENTISTS are now putting people in a bottle to find out what they smell like.

Although the experiments are at present in very preliminary stages, they may lead to the identification of criminals or diseases by "smell."

The experiments may even help lead to the development of bug repellents that are swallowed rather than sprayed, and potential drug addicts or alcoholics may one day be picked out long before they form the habit.

The bottle is actually a tube-shaped glass cell six feet long with an inside diameter of about two feet. A volunteer is put into the cell, which is fed with a constant stream of pure conditioned air. Outgoing air is caught in a multiple trap and all the vapors, both odorous and non-odorous from the person are captured.

The composition of these vapors is analyzed, giving the researchers a "chemical signature," which is somewhat like a fingerprint by smell.

"We are presently trying to find out which substances are common to all persons and which ones are not," reported project leader Dr. Andrew Dravnieks, Illinois Institute of Technology Research Institute, Chicago. "We are looking for the individual differences in 'chemical signatures.'"

So far the researchers have identified some 24 such substances that the body gives off.

MEDICINE

Diagnose Uterine Cancer

A new method that detects the amount of nucleic acids present within a cell will help early diagnosis of cancer of the uterus and thus save the lives of many women.

► THE LIVES of many of the 14,000 women who die of uterine cancer each year could be saved by early detection and treatment made possible by a new method of diagnosis developed at the University of Chicago Medical Center.

Dr. George Wied, University of Chicago, who developed the "fluorometric" test, says that approximately one of every 225 apparently healthy women is carrying uterine cancer cells although she has no symptoms that would make her aware of their presence.

Checkups for cancer inside the womb should be just as routine as those for cervical cancer, which the "Pap" smear made popular, Dr. Wied believes.

The fluorometric test is a painless procedure that does not require hospitalization or anesthesia. It costs about \$5.00 when given during a clinic visit at the University, and it could be equally simple and inexpensive for use by cell pathologists everywhere.

The present standard test, called punch

biopsy, involves the surgical removal of a small sample of tissue from the lining of the uterine cavity, but may miss a tumor area completely and provide only normal cells for diagnostic examination, Dr. Wied explains.

The new method removes material that includes a very good random sample of the entire cell population of the womb. A very narrow, sterile tube is used, which contains a tiny brush used to collect material for examination in which cells are suspended. These cells have been shed from the glandular lining of the wall of the uterus, and any tumor that develops in the womb is composed of glandular-type cells.

Dr. Wied uses an instrument called a fluorospectrophotometer that measures the fluorescent light from cancer cells, which, being greater than that from normal cells, establishes the presence of cancer before symptoms are noted.

The amount of fluorescence is directly related to the quantity of nucleic acids present within the nucleus of each cell. Cancer cells contain more nucleic acids than normal cells.

Dr. Wied was born in Czechoslovakia, but has been on the medical faculty of the University of Chicago since 1953. His wife, Daga M. Wied, is also an M.D.

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MEDICINE

Leukemia Cells Killed By X-ray but Not Virus

► AN EXPLANATION of why leukemic animals and humans often obtain a remarkable but temporary remission after X-ray treatment is seen in research reported by the American Cancer Society.

The leukemic cells die but the virus persists and infects new cells.

Dr. Ludwik Gross of the Cancer Research Unit of the Bronx Veterans Administration Hospital, who 14 years ago isolated a virus from "spontaneously" leukemic mice, reported research with the Gross virus that illustrates the new findings.

He and his co-workers collected common and very deadly leukemia viruses from leukemic rats, sealed them in ampoules and exposed them to X-rays of 100,000 to 1,000,000 roentgen units delivered by fuel elements from a nuclear reactor.

When these irradiated viruses were injected into newborn rats, the only viruses halfway inactivated were those exposed to one million roentgen units, and even then, five of the 11 rats inoculated with them got the disease. Only one of 38 rats injected with viruses irradiated with up to 750,000 roentgen units escaped the disease.

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Medicine may eventually be the most significant application for these studies, Dr. Dravnieks said. It is well known in both general and mental hospitals that various types of diseases are accompanied by various shades of odors, he said.

This may be a future method of diagnosing physical or mental diseases in their early stages.

It is believed that certain changes in a person's chemical makeup may induce a hunger for drugs or alcohol, Dr. Dravnieks said.

Since changes in the body chemistry are reflected in the "chemical signatures," potential addicts or alcoholics may be screened out, he added.

Criminologists may be able to tell whether a person was in a certain room or not by his "chemical signature."

"There are indications that 'chemical signatures' may be inherited," Dr. Dravnieks said. "Thus, we may be able to tell whether certain persons are related or not."

There are also plans for developing a mosquito repellent that can be eaten. The chemical repellent works its way to the skin and repels the bugs.

The bottling study, started in September, is helping to open up the new field of "olfactromics." This field not only deals with identifying the "chemical signatures" of people but of materials as well.

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