

## MEDICINE

# Aim For Cancer Immunity

**Faye Marley describes her visit, en route to Moscow, to the new Tumor Biology Building of Karolinska Institute in Stockholm where extensive cancer research is underway.**

➤ STOCKHOLM—Even a king must tread gently and cleanly when it comes to mice used for cancer research.

When visiting the small colony of uninfected mice in the new Tumor Biology Building of the Karolinska Institute, I had the privilege of standing, as it were, in the footsteps of King Gustav Adolf VI, 80-year-old monarch. I wore the same type of flannel shoe coverings which, in dedication ceremonies, he donned a few months ago to prevent tracking disease into this pristine laboratory.

The King stayed five hours listening to explanations of work in the new building, which in spite of the "state medicine" of Sweden was paid for by voluntary contributions through the Swedish Cancer Association.

Careful records are kept of generations of white mice here. Dr. George Klein, 37-year-old director of tumor biology, selects pairs of these mice for use in a study that may lead to successful cancer treatment for humans.

The squirming red newborn mice that I saw in the room where four strains of mice are bred for experiments seemed far removed from any relationship to human cancer, but in the next room, young Dr. Goran Moller showed me malignant tumors that had been induced in other older mice and said cautiously that "tumor specific antigens" in mice might open a clue for human cancer treatment. (An antigen is any foreign substance, which when introduced into the body, leads to the formation of antibodies.)

The tumor biology department of the unique 150-year-old medical school of Stockholm is one of 47 departments, including a hospital where patients are treated free.

Dr. Klein is the professor, as well as director, and his wife, Dr. Eva Klein, who came with him from Hungary 15 years ago, is first docent, or assistant.

A number of young husband and wife teams are working in the department, including the Mollers. Dr. and Mrs. Charles F. McKhann of Boston are working for a year and a half in Stockholm. Dr. McKhann, a surgeon from Massachusetts General Hospital and the John Collins Warren Laboratories of the Huntington Memorial Hospital of Harvard University, is working in immunology.

"Immune response to injected spleen cells in certain types of mice is influenced by the dose of cells injected," he explained.

His experiments have shown that small doses cause immunity to subsequent skin grafts. Large doses give prolonged graft survival and intermediate doses have no influence on the lasting effect of the graft.

Immunology, transplantation and virology are the leading research projects of the basic researchers at the tumor biology department, but chemotherapy is a cooperative project with the chemists working at Uppsala, Sweden.

"We do the mouse work," Dr. Moller said, "and the chemists work with such toxic drugs as 5-fluorouracil and 6-mercaptopurine. If chemotherapy could be combined with immunology, it might lead to something."

A new modern tumor "bank" is maintained for the World Health Organization. Its numerous small sealed tubes of mouse tumor can be maintained as long as eight or nine years.

When the National Cancer Institute at Bethesda, Md., for example, wants a tumor sample, a tube is opened and the tumor injected into a mouse which is sent across the Atlantic for experimental purposes. The temperature of the absolute alcohol in the bank where the tubes are immersed is 78 degrees centigrade below zero.

"We are inducing tolerance in mice that cannot yet be done with humans," Dr. Moller said. "Vaccination, for example, has great dangers. You are introducing a new tumor virus, and normal tissue is always present along with the abnormal so that other diseases such as encephalitis (inflammation of the brain) are a hazard. There is also the possibility of 'enhancement' of

the malignancy." Asked about the cancer vaccine of Dr. Bertil Bjorklund, who last December startled Swedish television audiences by dramatically jabbing himself with a hypodermic needle filled with his own vaccine, Dr. Moller said, "We should be as careful with cancer as scientists were with polio."

Seven researchers from the tumor biology department are participating in the Eighth International Cancer Congress in Moscow.

The new building looks out over an old wall once built by Russian slaves to enclose the northernmost part of Stockholm. The wall has almost crumbled.

• Science News Letter, 82:66 August 4, 1962

## TECHNOLOGY

## Machine Walks Like Man But at a Quicker Pace

➤ A GIANT machine that walks like a man and travels over roadless areas at 35 miles per hour is on the drawing boards. The walking vehicle will even be able to pick itself up when it falls, according to General Electric Company's engineers working on the project at Pittsfield, Mass.

Designed primarily for off-the-road locomotion, it would have legs 12 feet long. Agility and power over rough terrain, not speed, are its main design goals.

The walking vehicle is one of a series of applications envisioned for a new concept of man and machine, in which the human operator is coupled directly to the machine he operates. Movements are dictated by like movements of the operator inside.

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**WALKING VEHICLE**—The new walking vehicle with legs 12 feet high may look something like this model. An operator inside will maneuver the machine. The General Electric Company is studying the development of the machine under a U.S. Government contract.