

MEDICINE

Patient Given Cancer

Heroic woman, hopelessly sick, allowed doctors to back-transplant her own previously removed cancer cells, which had been cultured in test tubes for several months.

► THE STORY of a patient who wanted so much to "be useful to humanity" that she let doctors graft living cancer cells under her skin was related at the meeting of the American College of Surgeons in Chicago.

The patient was herself hopelessly sick with widespread cancer. She first let the doctors, at Memorial Hospital, New York, operate several times to remove pieces of cancer tissue for culture in test tubes and in laboratory animals.

After the cancer cells had been growing for several months outside the patient's body, the crucial test was made to see whether the cells were still human cancer cells. Proof of this came when they were back-transplanted under the patient's skin. They grew actively and, when pieces of this new cancer were removed for microscopic examination, they were seen to be identical with the cancer cells removed for examination so long ago.

The story was told by Dr. C. P. Rhoads, director of Memorial's Sloan-Kettering Institute for Cancer Research, to show that control over cancer can be won through chemicals, just as control of tuberculosis and other diseases due to invading germs has been won through development of suitable chemicals.

To test new chemicals against TB, scientists first have tried the chemicals out on cultures of human TB germs growing in test tubes outside the human body. Now, thanks in part to the heroic patient of the report, scientists know that the cancer cells they cultivate outside the human body are really human cancer cells.

When they find drugs, such as the new 6-mercaptopurine and the still newer, still on trial, azaserine, that might stop cancer, they can try them on cancer cells cultured outside the body.

If the drugs work on these cultured cells, they are working to destroy human cancers, not merely mouse or rat cancers, and can with more confidence be given to patients.

Dr. Rhoads stressed, however, that although cancer can be considered a foreign invader of the body, it cannot be considered a virus in the usual sense of the word. In fact, he said, the "virus theory" of cancer has perhaps led "to more misunderstanding than any other single topic" in cancer research.

"If," he said, "one restricts the term 'virus' to an agent capable of affecting by contagion, one derived from the external environment, and capable of inducing a permanent immunity, no evidence indicates that cancer in man is due to a virus. The question of virus etiology then becomes an academic one.

"If one extends the term 'virus' to include components of cells allied to genes or similarly inheritable units of the cytoplasm (often termed plasmagens), then one can easily develop a concept into which all the known observations will fit. The neoplastic (cancer) cell, by this concept, is a genetically modified unit.

"In some instances the gene or gene-like equipment has been modified by physical or chemical injury. In others this has occurred by the inclusion of new genes or similarly functioning units derived from other cells with different and neoplastic inheritable qualities.

"In either case our task is first to exploit existing leads to the chemical cure of cancer by the selective destruction of its component cells.

"Eventually we must define and eliminate the cause of the genetic modification which produces these cells."

Science News Letter, April 17, 1954

ASTROPHYSICS

Identify Solar Line

► TEMPERATURE OF the sun's corona may be even higher than the presently used 1,000,000 degrees Centigrade, a discovery at the High Altitude Observatory, Boulder, Colo., suggests.

The corona is the giant pearly white halo of the sun, spectacularly visible during an eclipse, but usually hidden by the million times brighter light of the sun. Using a special device, known as a coronagraph, scientists can produce an artificial eclipse for studying this part of the sun's outer atmosphere.

With it, they have confirmed that a previously unidentified yellow emission line of the solar corona is caused by calcium atoms that have been stripped of 14 electrons. This line can be found only when very violent events, such as sunspots, are seen to take place on the sun.

Dr. Walter O. Roberts, director of the Observatory, states that, in order for the calcium to be present in such a state, "there must be some source of powerful ionization corresponding to temperatures higher than 1,000,000 degrees Centigrade.

The identification was made under the sponsorship of the Office of Naval Research by Dr. Roberts, Donald E. Billings and Charlotte Pecker of the Observatory staff. Mrs. Pecker is a Fulbright scholar on a one-year leave of absence from Clermont-Ferrand University in France.

• RADIO

Saturday, April 24, 1954, 3:15-3:30 p.m. EST
"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Harold R. Wainerdi, medical director of the National Multiple Sclerosis Society, will discuss "The Mystery of Multiple Sclerosis."

PSYCHOLOGY

Pigeon Tests Show Thirst Ruins Appetite

► THE STRENGTH of hunger depends upon thirst, at least for pigeons. This interdependence of hunger and thirst was shown by experiments with key-pressing pigeons reported to the Eastern Psychological Association meeting in New York.

Three adult pigeons were trained by Drs. B. F. Skinner and C. B. Ferster of Harvard University to secure food and water by pecking at colored keys. Pecking the white key would bring food out of a machine. Pecking a green key would bring water.

When the pigeon had gone without water for a long time, he would slow down in his pecking at the white food key. When he had just consumed an overabundance of water, his pecking at the white key went way up.

Science News Letter, April 17, 1954

Identity of the yellow coronal line has puzzled scientists since it was found 16 years ago by Bernard Lyot of the Meudon Observatory, inventor of the world's first coronagraph.

Emission lines in the solar corona were first discovered by the American astronomers Harkness and Young in 1869. Their cause was a long-standing mystery, however, since not a single one agreed in wavelength with the spectrum lines given by any known atoms in laboratory measurements. The name "coronium" was given to the unknown atomic gas.

In 1940, Dr. Bengt Edlen of the University of Uppsala, Sweden, identified the atomic composition of almost all of the lines. In particular, he showed that the principal spectrum lines, the green coronal line and the red coronal line, both arose from iron, but iron at so high a temperature and so low a pressure that it is impossible to produce its spectrum lines in the laboratory. Thus he explained the failure of previous investigators.

The suggestion, now confirmed, that the yellow line was due to calcium was made by Dr. Max Waldmeier of the Eidgenossische Sternwarte in Zurich, Switzerland. Details of the identification will be published in *Comptes Rendus*, official journal of the French Academy of Sciences.

Science News Letter, April 17, 1954