

MEDICINE

Viruses Elude Microscope

EVIDENCE that cancer may be caused by a virus the microscope misses was presented by two Rutgers University scientists at New Brunswick, N. J.

The evidence is based on animal studies by Drs. Vincent Groupe and Frank J. Rauscher of the University's Institute for Microbiology. The men have been working with RSV, the Rous sarcoma virus, known to cause deadly cancer of connective tissue in chickens and turkeys.

They have found that chicken cancers contain some substance that destroys cancer-causing viruses. If chickens are given large doses of the virus, the resulting cancers are full of virus that can be harvested from the tumors. If only small doses are injected, however, the virus cannot be detected although cancers develop, Dr. Groupe said.

This has led him to suspect that perhaps when scientists look for a cancer-causing virus in human cancers, it is present in such small amounts that it cannot be detected or is in a non-infectious form.

Recently the scientists produced cancers by injecting turkeys with RSV and extracted from tumors a substance that knocked out cancer viruses growing in

eggs or maintained in laboratory animals. Only those tumors that had been growing for two weeks or more seemed to contain the mysterious anti-virus substance. Tumors grown only a short time had none, he said.

Even the blood of some of the turkeys contained the virus-destroying substance, which in many respects resembles antibodies. The researchers found that the virus-inhibitor substance was not always associated with the presence or absence of virus in the tumor—cancers frequently contained the anti-virus material regardless of whether or not virus could be recovered from them.

Sometimes the factor could be found in blood but not tumor tissues. Sometimes just the opposite was true. The factor eliminated RSV only; it had no effect at all on a half-dozen other non-cancer viruses.

The work at this stage has yielded no answers applicable to cancer in humans except to indicate some of the factors which may influence the success or failure of attempts to isolate viruses from human cancer tissue, Dr. Groupe stressed.

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RADIO ASTRONOMY

Large Radio Telescope

ONE OF the largest non-steerable radio-telescopes in the world is being built in a ravine on a bluff of the Vermillion River about 35 miles east of the University of Illinois at Urbana.

The trough-shaped receiver of the instrument can be built in the sunken terrain at less cost. The ravine also gives natural protection against radio interference.

The ravine's sides and bottom will be smoothed and covered with metal, producing a large reflector about 150 feet above the bottom of the trough. Tall towers down the center of the trough will support the receiving units.

The metal reflector will be 600 feet long, its cylindrical axis lying north and south. It will be 400 feet wide and 65 feet deep.

The wavelength it will receive is about one-half meter, or about 20 inches.

Dr. George C. McVittie, head of the University's astronomy department and an internationally known scientist, heads development of the huge instrument. He said it should pick up radio waves from distances far beyond any now reached, signals that have been billions of years on the way from their source in space.

Dr. George W. Swenson Jr., of the University's engineering department designed the radio telescope.

The receiving area will be more than twice the size of the 250-foot radio telescope at Manchester, England, the largest in use. The British instrument is steerable.

The beam of the University of Illinois' radio telescope will be steerable only in the meridian plane. Observers will have to wait for the earth's rotation to bring the source being studied over it.

The instrument and related equipment will occupy an area larger than six football playing fields. To give protection from electrical disturbances, more than 220 acres were purchased.

Cost of the installation will be more than \$250,000. The Office of Naval Research is financing the estimated cost of the telescope itself, about \$233,000. The University is supplying other necessary funds. The large radio telescope is expected to be in operation in about two years.

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TECHNOLOGY

Russians Claim Another First for Radiosondes

THE RUSSIANS are claiming another first in science and technology—that a Russian engineer used the first radiosonde. Radiosondes are devices that broadcast radio waves to allow tracking of their airborne positions and receipt of information concerning their environment.

However, a definitive list of all available references to radiosondes just completed in the U. S. shows that a radiosonde device was used in the U. S. by D. C. Wilkerson in 1924, whereas the earliest published

reference to the Russian engineer's work was in 1928.

Lawrence B. Whit of Westport, Conn., compiled the radiosonde listing at a time when it was thought the airborne instrument would become a symbol for the International Geophysical Year, which ended Dec. 31, 1958. The earliest reference to radiosondes that Mr. Whit uncovered appeared in the Weather Bureau's *Monthly Weather Review* in June, 1920, in a discussion of aerological instruments.

The only other reference to radiosondes prior to Mr. Wilkerson's 1924 report appeared in a German journal in 1923. Mr. Wilkerson used a radiosonde device for three-dimensional tracking of aerial bombs or pilotless planes.

The Russian claim for first use was reported by the U. S. Department of Commerce in *Information on Soviet Bloc International Geophysical Cooperation—1959*.

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OCEANOGRAPHY

Safety of Waste Disposal Into Sea Questioned

THE DEEP WATERS of the oceans are not isolated, but on the contrary a very intensive mixing is taking place continuously, Russian scientists are convinced.

The Russians have undertaken extensive studies of the movement of the waters and have found that there are different layers of water in the ocean down to a depth of seven miles.

A turbulence occurs where these layers converge, and this is responsible for the overall mixing of the water. This was reported by Prof. L. A. Zenkevitch in a paper presented to the experts in Monaco participating in a conference of the International Atomic Energy Agency on the disposal of radioactive wastes.

Soviet scientists have also found clear indications that there are strong vertical movements in the Black Sea. The mixing of the water sometimes transports material from the bottom of the Black Sea very rapidly to the surface.

In another paper Prof. P. A. Moiseev objected to any form of disposal of radioactive wastes into the sea. Considering both biological and physical transport of waste products, he came to the conclusion that radioactive waste emerging from a container at very great depths does not stay localized but will mix rapidly and will finally be brought to the surface waters.

U. S. scientists objected and pointed out that the Russians had quoted no figures in their papers about the time it will take for bottom waters of the ocean to come to the surface. Prof. F. F. Koczy of the Marine Laboratory of the University of Miami mentioned that, according to determinations by carbon-14 measurements and by radium measurements, the time span for the total displacement of surface water by deep water or vice versa has been found to be 400 to 600 years in the Atlantic and 1500 to 2300 years in the Pacific.

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