

ASTRONOMY

2-Channel TV Telescope Developed in Russia

➤ A TWO-CHANNEL television telescope has been developed in Russia for studies of the moon, planets, and stars.

The TV tubes and two screens make it possible to study simultaneously images in different parts of the spectrum of celestial bodies. Because of the bright image achieved, exposures are short resulting in greater brightness, it was reported in an article translated by the U.S. Joint Publications Research Service in Washington, D. C.

The telescope was developed by the Main Astronomical Observatory of the Academy of Sciences in Pulkovo. It consists of two identical reflecting telescopes with lenses about 18 inches in diameter. The telescopes are connected by a common circuit.

The new TV telescope is expected to "look" at the skies sometime in 1962 after adjustment and mounting in a structure especially built for the new telescope.

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NATURAL RESOURCES

Radioactivity in Water Discussed by Geologists

➤ RADIOACTIVE WASTES creeping into the water supplies of the country from nuclear test plants and dumping grounds have aroused much interest.

Radiation in the nation's most precious mineral, water, was discussed by leading geologists at the American Geophysical Union meeting in Washington, D. C.

Four widely separated areas—Idaho, Washington, Tennessee and South Carolina—were found to contain quantities of radioactive chemicals in well and river water stemming from nuclear reactors and other similar facilities, scientists noted. High amounts of tritium, a radioactive tracer, were found more than three miles from underground dumping sources in some areas.

The indications of seepage and movement of radioactive wastes and chemical compounds were strong in all of the studies reported at the meeting. Some of the radioactive products were followed many miles down the Columbia River in one survey.

Concentrations as high as one million tritium units (one tritium atom per billion billion hydrogen atoms) were found 700 feet from the disposal well and 1,200 tritium units were found three miles from the site near an Idaho station. Only four years before, an insignificant count of 50 tritium units was found close to the well, Dr. Paul H. Jones of the U.S. Geological Survey reported.

From a Savannah River disposal plant, using open seepage basins for the disposal of liquid radioactive waste and a burial ground for solid wastes, all but one of the radioactive chemicals released to the basin were found in surrounding waters. None from the burial ground were detected, however, Dr. S. O. Reichert of the Du Pont Company said.

A study is under way to trace the radio-nuclides released to the Clinch River at Oak Ridge, Tenn., Dr. M. A. Churchill announced. It will determine concentrations and proportions that reach downstream locations.

In the Columbia River, General Electric scientists at Richland, Wash., are determining the amount of radioisotopes introduced by the return of water used to cool the Hanford reactors.

They found trace amounts of both fission-product and activation-product isotopes in the river. These could be removed by self-purification up to 35% in the first 40 miles after release.

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PHYSIOLOGY

Drunks and Teetotalers Found in Baby Chicks

➤ THE INDIVIDUALITY among human beings that may make one man an alcoholic and another a teetotaler has its counterpart among such lowly animals as chickens and rats, a team of scientists from the University of Texas, Austin, reported to the National Academy of Sciences meeting in Washington, D. C.

Liking for alcohol varies greatly among baby chicks even when they have very similar heredity due to inbreeding. When the chicks are given free access to a synthetic beer containing four percent alcohol, some of the baby chicks will stay intoxicated most of the time. Others will not drink enough to be affected, and some will leave the beer alone entirely.

Among young inbred rats some, like the fat girl in human society, will eat 17 times as much sugar as others. Some will eat seven times as much butter as others. Others will eat 45 times as much fortified yeast.

There are differences, too, in the amount they will exercise. If given access to exercise wheels, one rat will travel only 150 feet a day, on the average, while another may travel two miles each day.

In both experimental animals and human beings, differences were found in the individual weight of organs, including stomachs, livers, kidneys and endocrine glands. One human's heart may be ten times heavier than that of another human the same size.

It seems probable, the scientists said, that these differences in organs and endocrine activities are related to the differences in appetite and behavior.

The Texas team is composed of Drs. Roger J. Williams, Richard B. Pelton and Frank L. Siegel.

Another link between body chemistry and appetite was reported to the Academy by Drs. Neal E. Miller, Kay S. Gottesman and John E. Holmes of Yale University. They told how injection of certain chemicals in specific areas of the brain would make satiated rats eat or drink an additional amount.

Administration of the poisons contained in bacterial cells, it was found, can have the opposite effect in cutting down the water intake of rats.

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IN SCIEN

GENERAL SCIENCE

American Society for Interlingua Formed

➤ A SOCIETY for those interested in the international language, Interlingua, that is used for abstracts and summaries of technical papers, particularly in the field of medicine, is being formed.

Members will also become part of the world organization, Union Mundial pro Interlingua, with headquarters in Geneva, of which Dr. Alexander Gode of SCIENCE SERVICE, New York, is president.

Interlingua is used in some 25 world medical journals to make summaries readable to all who are familiar with European languages. It has been used for abstracts in the programs of world medical congresses. It has also been widely used in other scientific fields, such as spectroscopy.

Further use of this language, which is easily read, is advocated by the organizers of the American Interlingua Society, headed provisionally by Hugh E. Blair of SCIENCE SERVICE's Interlingua Division. Teachers of Latin and modern languages are expected to join, as the simplified language forms a base for further language study.

The organizers of the new society do not present Interlingua as a panacea but simply as one tool of international communication, of demonstrated usefulness.

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OCEANOGRAPHY

Sound Waves to Explore For Manganese in Ocean

➤ SOUND WAVES can be used to explore the ocean bottom for the chunks of manganese ore scattered along the ocean floor. Scientists visualize the mining of the ocean floor for this element valuable in steel alloys.

The sound waves, sent by ship-borne instruments, would reflect at unusual angles when hitting large pockets of manganese nodules. The nodules, sized from a pea to a man's fists, are small objects such as shark's teeth or clay lumps, coated by many layers of manganese precipitated from the ocean waters.

This exploratory use of sound waves was suggested by John C. Fry, staff scientist aboard the U.S. Navy Commander Cruiser Destroyer Flotilla THREE, Long Beach, Calif., at the American Geophysical Union meeting in Washington, D. C.

During studies of sound velocities in water and in sediment covering the ocean bottom, the scientist also found that the velocity of debris rushing down submarine slopes sometimes exceeded that in surrounding water. The experiments were carried on at 40 stations widely spaced throughout the Pacific Ocean.

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CE FIELDS

GENERAL SCIENCE

System Set for Centers Of Technical Reports

► SCIENTIFIC REPORTS from Government agencies will soon be available from 12 widespread universities and libraries serving the entire United States.

Relieving a long-standing problem of the unavailability of information from Federally-sponsored research, the 12 centers have been chosen to help scientists and engineers obtain a complete, up-to-date collection of the Government's unclassified reports.

The Office of Technical Services of the U.S. Department of Commerce has accepted the responsibility for directing and coordinating the system.

Centers will receive copies of reports from Federal agencies, maintain a collection of the materials and furnish them to the general public. The 12 were chosen because of their desirable locations and room for expansion.

The centers will be located in cities such as Cambridge, Mass., Washington, D. C., Dallas, Texas, and Los Angeles, Calif.

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METEOROLOGY

Model of Hurricane's Bands Made in "Dishpan"

► MODELS of the cloud bands characteristic of hurricanes are being made in a rotating "dishpan" in Massachusetts.

The miniature hurricanes, made visible by a purple dye, are helping weathermen understand the forces that drive the tropical storms, which yearly take a high toll in lives and property. Dr. Alan J. Faller of Woods Hole Oceanographic Institution, Woods Hole, Mass., told SCIENCE SERVICE that the cloud bands of his model behaved in the same way as do spiral bands in a real hurricane.

Spiral bands can be seen on radar screens, since the radar waves are bounced from precipitation areas within intense tropical storms. They curve in a counter-clockwise direction toward the center of the storm and appear to merge to form the wall around the eye of a hurricane.

The spiral band pattern is most pronounced when the storm center is not moving.

Dr. Faller said that in his dishpan models the artificial clouds were being constantly replaced by convection from below and swept away at the top. This is believed to be what actually happens in a full-fledged hurricane.

Another kind of model of the earth's atmosphere, a mathematical one for use with electronic computers, was explained to the American Meteorological Society

meeting in Washington by Dr. George P. Cressman, director of the U.S. Weather Bureau's National Meteorological Center, Suitland, Md.

This mathematical model divides the atmosphere into three levels, and also takes into account the effects of surface friction and mountains. It is based on a model of the atmosphere that includes both temperature and pressure, rather than the pressure-only model now used in computer forecasts.

Dr. Cressman said that his so-called "three-level baroclinic" model produces "better forecasts" than the pressure-based model.

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SPACE

Device Measures Heat In Mars or Venus Entry

► ONE OF THE SMALLEST telemetering devices in the world is being used to measure the extreme heating encountered by space vehicles entering the atmosphere of Mars or Venus.

A quarter of an inch in diameter and approximately a quarter of an inch long, the device is actually a model of a nose cone and heat shield with a thermocouple attached. As the model is shot down a range area filled with gases representative of the atmosphere of the planet to be explored, the thermocouple sends off signals which reveal the actual surface temperature of the nose cone in entering the planet's atmosphere.

The device is being used at the National Aeronautics and Space Administration's Ames Research Center, Moffett Field, Calif.

The miniature simulated interplanetary space probes are not yet aimed at long-range, manned flight, NASA research scientists James L. Summers of the Ames Hypervelocity Ballistic Range Branch, told SCIENCE SERVICE. "Manned interplanetary flight obviously is a long way off," the scientist said, "but we want to get knowledge that will let us prepare for vehicle shielding for the unmanned vehicles that will be used for interplanetary travel in the near future."

The heat recordings for the simulated flights to Mars and Venus can be assumed to be fairly accurate since heat measurements by the tiny space model of simulated reentry into the earth's atmosphere check well with data gained in actual space flight and reentry.

For the flights to Mars, the small range is filled with nitrogen and carbon dioxide. "There are undoubtedly other gases present, but spectroscopic techniques today do not have the sensitivity to detect other things such as water vapor, for example," Mr. Summers said. "Water vapor may be part of the atmosphere of Mars but it is not detectable."

There is less certainty about the gases in the atmosphere of Venus. The latest thinking is that Venus may have a very thick atmosphere with a "dry earth" surface instead of being a planet whose surface is largely oceanic. Venus probes at Ames are exploring both views.

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MEDICINE

Survival Prolonged By Leukemia Treatment

► THE AVERAGE survival time for 40 children treated for acute leukemia was slightly over nine months, two physicians from the Royal Victoria Infirmary, Newcastle upon Tyne, reported in the British Medical Journal, April 28, 1962.

Nine of ten untreated children died in about 12 days after diagnosis of the so-far incurable cancer of the blood. The tenth lived only two months.

Carefully guarded treatment, in addition to blood transfusions given occasionally, began with steroids (cortisone or prednisone). Remissions of the disease occurred in most cases, after which "antimetabolite therapy" consisting mostly of 6-mercaptopurine, was given. Other drugs used were the folic antagonists aminopterin and methotrexate.

Drs. R. B. Thompson and W. Walker, who reported the study, said that brain complications occurred in four children.

The age of the patients ranged from five weeks to 14 years. Some of the older children had remissions of the disease that enabled them to attend school, but the researchers said they could not claim more than 60% of remissions among the 40 children treated.

The physicians were not optimistic about their results, saying that survival time does not mean that there has been "a restoration to anything like normal health and well-being." Remissions of the disease were claimed only when there was a restoration of all blood values to normal.

"During the past ten years or so," the doctors said, "the problem of malignant disease in childhood—particularly acute leukemia—has assumed a much greater importance than hitherto." The availability of new treatments has led to hope that more potent and permanent remedies may be discovered. This study showed how the disease can presently be managed.

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METEOROLOGY

"Cloudbusting" Machine Makes Dry Ice Pellets

► A METHOD for making the Dry Ice that can be dropped from airplanes to form holes in cloud layers is being tested by scientists at the Air Force Cambridge Research laboratories.

During recent flight tests using the technique, holes more than three miles wide were created in supercooled clouds. The purpose is to provide pilots with an economical method of clearing away clouds as needed with chemicals carried aboard the airplane.

A new machine known as the "cloudbuster" makes the Dry Ice pellets directly from liquid carbon dioxide. The feasibility of dissipating supercooled clouds by seeding with Dry Ice has been known for many years, but previous equipment for making the pellets was uneconomical and clumsy.

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