SPACE TECHNOLOGY

'Streetcar Satellite' To Study Particles

➤ NINE POUNDS of electronics designed to probe atomic particles and magnetic fields in interplanetary space will ride the OGO-E "streetcar satellite."

The satellite, fifth in the Orbiting Geophysical Observatory series, is scheduled for launch in mid-1966. It gets its nickname "streetcar" from its row of compartments, each holding a separate experiment.

The project is part of a long-range study by two geophysicists, Drs. Paul J. Coleman and Thomas A. Farley, of the University of California at Los Angeles, working under Dr. Willard F. Libby and supported by a $200,000 grant from the National Aeronautics and Space Administration. Participating in the OGO-E experiment is Darrell L. Judge, University of Southern California, Los Angeles.

"Interplanetary space is a sea of particles, but we still know very little about them or their interaction with the magnetic fields of the earth, the sun and the planets," says Dr. Farley.

"The more we can find out about them, the more we will learn about the radiation hazards of space flight, magnetic storms, and the basic principles of nature."

Scientists are particularly interested in the way particles interact with magnetic fields as a guide to the fields' strength and direction. This knowledge, in turn, can tell a great deal about the interior constitution of the sun, planets and moon.

Heart of the group's OGO-E instrument, a particle detector, is a photomultiplier tube with a scintillating crystal. When a particle strikes the crystal, it produces a light pulse that is converted into an electric pulse and recorded on magnetic tape. The information on the tape is fed into a computer and then analyzed by the scientists.

• Science News Letter, 86:232 October 10, 1964

PSYCHOLOGY

Voice Recordings Show Experimenters Biased

➤ PSYCHOLOGISTS, through various tones of voice, often inject their own biases when testing persons for research.

Experimenters studying other experimenters recently found that standard tests given to groups of persons are not always identical, because researchers often unknowingly influence subjects to perform in accordance with their pet theories.

Eight hypnotist-experimenters gave one of two versions of the Stanford Hypnotic Susceptibility Scales to a group to study the group's responses to standard tests on hypnotic suggestibility. In the first test the subjects were not hynotized but were urged to imagine certain things to be true. In the second test the researchers attempted to hypnotize the subjects.

During the tests other researchers recorded the voices of the experimenters, who read both tests from a standardized form. The voices from both tests were then judged and it was found that definite differences in presentation occurred.

Voices of the experimenters in the first test, where no hypnotism was attempted, were described by the judges as business-like, conversational, brisk or rational. Voices of the experimenters when attempting to hypnotize were described as relaxed, coaxing, insistent, soft or soothing.

The experimenters giving the tests were reported as 1. experienced, 2. trying to test all subjects identically, 3. aware of the importances of testing all identically, and 4. aware that their performance was being recorded and judged.

Yet they were still unable to treat all subjects the same. They did not even realize that they had treated the groups differently.

The research was reported by Suzanne A. Troffer and Charles T. Tart, laboratory of human development, Stanford University, Stanford, Calif., in Science, 145:1330, 1964.

Findings such as these indicate it may be necessary for other experimenters to either try to eliminate possible bias or compensate for it when analyzing and interpreting their data, the researchers said.

• Science News Letter, 86:232 October 10, 1964

EDUCATION

Computer to Teach College Students

➤ A GROUP of college students will soon have a computer for a teacher.

The computer system is being readied to teach a series of college courses as part of an experiment to evaluate "computer-assisted instruction" as a tool for education. The system, which can simultaneously give individual lessons to a number of students in a wide variety of subjects, is being studied by the International Business Machines Corporation.

In the experimental system a teacher's instructions, questions and guidance are stored in the computer and presented to the students via typewriter consoles. The student answers questions on a typewriter.

The computer analyzes the student's answer and, according to the teacher's plan, responds with clues, questions, remedial study matter, drills or the next assignment. The computer can also "grade" the student by recording response times, errors and other data on his performance.

Under this experimental system a teacher has merely to type out his course material at a typewriter station. The computer then takes over to "teach" the course from there.

Four courses are being prepared by faculty members at the Pennsylvania State University, University Park, Pa., for use by students at a typewriter station located on campus. This station is connected via commercial telephone lines to an IBM data processing system at the Thomas J. Watson Research Center in Yorktown, N.Y.

The courses include cost accounting, engineering economics, "new mathematics" and audiology. The Penn State project, under the direction of Profs. Harold E. Mitzel and Kenneth H. Wodtke, is being aided by a $97,000 grant from the U.S. Office of Education.

• Science News Letter, 86:232 October 10, 1964

IN SCIEN

ASTRONOMY

Quasars in Milky Way Could Be Nearing Earth

➤ SOME of the strange objects in the heavens called quasars could be rushing toward earth, while others rush from it.

If so, the likely reason such approaching motion has not been detected is that no one has seriously looked for it, Dr. Banesh Hoffmann of Queens College of the City University of New York, Long Island, believes.

Dr. James Terrel of the Los Alamos Scientific Laboratory, Los Alamos, N. Mex., has suggested that quasars could have resulted from an explosion or explosions within the Milky Way, the galaxy in which the sun, earth and its planets are located. Quasars could, therefore, be much closer to earth than had been thought.

If Dr. Terrell's theory is correct, and if this blast was not too long ago, debris from the explosion would be approaching earth as well as flying away from it, Dr. Hoffmann suggests.

Detection of approaching objects would support Dr. Terrell's theory, Dr. Hoffmann reported in Science, 145:1336, 1964.

• Science News Letter, 86:232 October 10, 1964

BIOCHEMISTRY

Asthma Cause Sought In Tiny Saliva Crystals

➤ TINY CRYSTALS found in the saliva of asthmatics may provide a significant clue to the cause of asthma.

Previously, scientists suspected that these crystals, still not identified, were present in only one type of white blood cells, called eosinophiles. Now, however, these crystals are believed present in basophiles, a second type.

Two researchers, Dr. G. Archer of the Red Cross Blood Transfusion Service, and Miss A. Blackwood of the New South Wales Asthma Foundation, both in Sydney, Australia, are now trying to determine the chemical structure of the crystals.

Dr. Archer said basophiles store various substances such as histamine, which is released in allergic reactions. This suggests that basophiles could be a cause of asthma, particularly relating to smooth muscle contraction that occurs in the asthmatic's lungs.

The tiny crystals have been found in large amounts in the lungs of asthma sufferers, he said.

"We do not know what we may find in the structure of the crystals," Dr. Archer said. "The fact that they occur in these two cells seems to suggest we should concentrate on the cells. In them we may be able to find a significant clue to the cause of asthma."

• Science News Letter, 86:232 October 10, 1964

SCIENCE FIELDS

RADIOLOGY

Brain Damage Detected By Radioactive Isotopes

➤ RADIOACTIVE ISOTOPES of mercury have been used to confirm brain damage resulting from strokes and accidents, scientists told the meeting of the American Roentgen Ray Society in Minneapolis.

In stroke damage detection, a brain scan is made with a radiation counter after the isotope is injected into a patient. Where the damage is done a heavier pattern is revealed on the counter than with surrounding normal tissue. This is because the isotope tends to collect at the abnormal areas, Dr. Yen Wang of the University of Pittsburgh School of Medicine, reported.

Dr. Wang said the isotope method also aids in determining whether there is cancer in the damaged area of the brain. In ordinary stroke cases, the isotope builds up in the damaged region during the early weeks following a stroke and then disappears from four to six weeks later.

If the buildup does not disappear, cancerous growth must be suspected, he said.

Drs. Albert J. Gilson and Fredie P. Gargano, both affiliated with Jackson Memorial Hospital, University of Miami Medical School, Miami, said brain scanning with radioactive isotopes is valuable also for diagnosing damage caused by accidents.

In a study of 73 patients, they said the scanning device confirmed 28 persons with types of accident-caused brain damage. Twenty-two of the 28 confirmed by the scanning method were substantiated by X-ray studies of brain arteries.

The two scientists said the brain scanning technique involves no hazard or pain to the patient.

• Science News Letter, 86:233 October 10, 1964

ZOOLOGY

Electronic Bat Sounds Drive Insects Away

➤ AT THE MECHANICAL CRY of a bat, pesty bollworms dive and frantically run away.

Scientists are now imitating the high-pitched cries of the hunting bat in an effort to drive insect pests away from cotton fields. Rotating loudspeakers send artificial sound waves over the countryside at frequencies that are designed not to be heard by the human ear, not to disturb beneficial insects, but to send harmful insects scurrying.

Night-flying bats locate their prey in the dark by the radar method of squeaking as they fly and listening for the echo of their cries bouncing from the prey.

But their prey can also hear the cry—insects can pick up the sound waves through resonance hearing organs called tympanums that vibrate, comparable to eardrums. Thus warned of the bat's approach, the insects begin spiraling, diving and trying to hide.

Scientists of the U.S. Department of Agriculture's Research Service, in cooperation with the South Carolina Agricultural Experiment Station in Clemson, S.C., are studying the reactions of the destructive bollworm moth to bat cries simulated on electronic equipment.

In laboratory tests, the scientists tried varying sound frequencies and measured the response. They found that the bollworm, *Heliothis zea,* responded in the same manner to the simulated sounds as to actual bat cries.

The scientists believe that bursts of sound at a frequency of 21 kilocycles per second may be the most effective for broadcasting over the fields. This frequency would not be heard by humans, who can usually detect sounds up to only about 15 or 18 kilocycles per second.

• Science News Letter, 86:233 October 10, 1964

DERMATOLOGY

Acne Problem Calls for Doctor's Care, AMA Says

➤ WAITING to "outgrow" acne is a mistake, the American Medical Association says. Teen-agers need not worry about their pimples, blackheads and boils, but should go to the family doctor when they first notice these blemishes.

Johnny and Mary should not take the advice of friends on what treatment to use, because different persons require different medications, an official AMA statement warned.

Do not expect your doctor to give you a magic pill because there is no one-shot cure. Antibiotics or other drugs, ultraviolet light or X-ray treatment may suit the needs of some young people but not of others.

Faithful and patient skin care and even shampooing of the hair are simple measures advised by the AMA. Wash the face two or three times daily with soap and hot water, but do not irritate the skin with hard scrubbing.

The washing is to remove oils and to clear plugged oil glands, thus helping to keep blackheads to a minimum. The blackness of the blackhead is not dirt, but is due to a chemical change in the secretions from the oil glands. Acne is caused by poor adjustment of the skin to secretions of maturing glands. The imbalance of hormone secretions usually is corrected around the age of 18 or 19.

Permanent scarring can result from picking, scratching, popping and squeezing pimples. If a doctor recommends that an individual open pimples or extract blackheads himself, he will explain how to do it without damage.

Diet itself will not clear the skin, but some persons seem to be made worse by even small amounts of rich foods, particularly chocolate.

The sensitive age when acne strikes can make young people very unhappy, and for this reason parents should be sympathetic.

• Science News Letter, 86:233 October 10, 1964

MILITARY SCIENCE

U.S. Prepared to Detect Atomic Explosions

➤ WITH ITS NETWORK of detecting devices on land, on sea and in outer space, the United States should know within seconds when the Red Chinese set off their first atomic explosion.

Secretary of State Dean Rusk said confidently that when it does happen "we shall know about it and make the information public."

Although most information about U.S. detection capabilities is classified, it is rumored that the Air Force has sent up satellites for detecting nuclear explosions in Communist countries.

Satellite-based detectors have the advantage over others in detecting radiations from a nuclear burst since the waves they pick up have encountered the least atmospheric interference.

Last October the United States sent to a height of 60,000 miles two experimental satellites especially designed for nuclear detection in space. Last July two more such satellites were placed in orbit. All four are reported to be still working properly.

The United States also is believed to have in orbit a fleet of secret satellites equipped with devices for measuring even small changes in temperatures on earth. They also are thought to have cameras capable of taking amazingly clear pictures of suspicious activity on earth.

For deep underground explosions, waves are picked up by seismographic instruments that work in the same way as those used to detect earthquakes. Since most radioactive products given off by the explosion are contained within the ground, underground blasts are not detected by most other devices.

• Science News Letter, 86:233 October 10, 1964

OCEANOGRAPHY

Oceanographic Research Reveals Seal Skeleton

See Front Cover

➤ AN UNDERWATER CAMERA that can be lowered 30,000 feet is now scanning the floor of the ocean in oceanographic research.

The camera, developed by Edgerton, Germeshausen and Grier, Inc., Boston, is lowered from the oceanographic ship by means of a cable until the camera is hovering a few feet above the surface or object to be photographed. As the ship moves along, the camera takes pictures at the rate of 12 per second. The strobe lighting system also developed by EG&G is used with the camera, which can take up to 500 pictures in one run.

Seen on this week's front cover is a photograph of bones of a fur seal taken at a depth of 1,800 feet in the Pacific Ocean off the coast of Alaska by the U.S. Navy Oceanographic Office during normal field survey operations.

• Science News Letter, 86:233 October 10, 1964