

## AERONAUTICS

**Device Positions Distant Planes in Five Seconds**

➤ A DEVICE being used by the British Fleet Air Arm can tell in five seconds the position of an airplane hundreds of miles away from control centers.

Two control stations have been established: in Somerset, southwest England, and near Glasgow, Scotland, to control a network covering the whole of England and its coastal waters. They are the first installations of their kind.

The high speed fixer can be used by any aircraft with the usual radio telephone equipment. Hitherto it took as long as one minute to give a pilot his position after passing bearings to the central control station by telephone.

The pilot now has merely to press a button and his position is promptly plotted by intersecting beams of light on a glass screen at the control center. This location system will be valuable to civil aviation and in sea rescue work.

Installations similar to those introduced by the Navy are being prepared for the RAF, which plans to have five stations at the disposal of civil international air traffic. The Royal Netherlands Air Force plans two stations. The Belgians are also to have a network of ten of these stations.

Standard Telephones and Cables have evolved the system.

Air-sea rescue work will be much accelerated. In the future, a pilot will need only to switch on his set before the aircraft comes down in the water and his position will be seen at once by observers.

Science News Letter, May 11, 1957

## PHYSICS

**Report New Solutions To Einstein Equations**

➤ NEW SOLUTIONS to Einstein's equations making clear the age relationship between a space traveler and his earthbound twin brother were reported to the American Physical Society meeting in Washington.

Space ships could provide a "modern-day fountain of youth" if they could be made to travel 185,000 miles a second, 1,000 miles under light's speed.

As expected from Einstein's theory of relativity, an increased lifetime has actually been observed for very fast-moving atomic and radioactive particles, Dr. Harold W. Lewis of the University of Wisconsin said.

If heartbeats and other biological clocks follow the same rules of physics as do these particles, and there is every reason to believe they do, then a person traveling at close to light's speed would not age as fast as his stay-at-home twin.

A journey to the nearest star and back, for instance, at 185,000 miles a second would take more than eight years as measured by earth time. The space traveler, however, since the aging process is a

natural clock, would age less than one year during the round trip. He would return seven years younger than his twin who would have grown eight years older.

This is the so-called "twin paradox," which some scientists find difficult to believe. They contend that Einstein's theory of relativity does not distinguish between the two twins, so they cannot end up at different ages, if they are separated and one is accelerated, then the two reunited in the initial reference frame.

Such an argument was anticipated and answered by Einstein in his first paper on general relativity. Now Dr. Lewis has shown there are complete solutions of the equations of general relativity that include the twins' fundamental symmetry, yet permit them to age by different amounts. He notes the correct answer to the twin paradox has been clear since the general theory of relativity was first published.

Science News Letter, May 11, 1957

## PSYCHOBIOLOGY

**Electric Current Can Reward or Punish**

➤ MILD ELECTRIC currents applied to certain zones in the brain of a monkey can serve as a reward to the animal for work performed or problems solved. The animal can learn to throw the switch himself to start the electric current.

In other zones of the brain, the electric current serves as a punishment and in this case the animal can learn to turn it off without, however, showing any signs of pain or fear, which he would show if the current were stronger.

The mapping of approximately 500 such start and stop zones in the subcortical regions of the brains of three monkeys was reported to the National Academy of Sciences by Dr. John C. Lilly of the National Institute of Mental Health.

The "start" zones in which the electricity serves as a self-applied reward were found to be much more numerous than the "stop," or punishment, zones. So far most of the neocortex appears to be relatively neutral.

Science News Letter, May 11, 1957

## PSYCHOLOGY

**Lip Reading Widespread In Noisy World**

➤ LIP READING is more widespread in this modern, noisy world than we realize.

Dr. Alfred Larr of the University of California at Los Angeles said people who work in noisy environments but whose efficiency of work depends on their accuracy of hearing, unconsciously learn to watch not only the lips of the speaker, but his facial expressions and gestures.

Dr. Larr, who teaches hearing therapy, is working on a project to determine the effectiveness of lip reading training under sound-proof conditions.

Science News Letter, May 11, 1957

**IN SCIENCE**

## VIROLOGY

**Combined Research Tool Shows Up Size of Virus**

➤ SCIENTISTS have a new tool for studying and fighting virus infections, the Society of American Bacteriologists meeting in Detroit, Mich., was told.

The tool combines fluorescence and electron microscopy as a technique that may provide needed answers in the fight against viruses, a team of researchers from the University of Southern California School of Medicine reported.

The combination research technique has already enabled the California scientists to see into human tissue culture cells infected with measles virus and study its growth and development. The study showed measles might be one of the smaller animal viruses, comparable in size to polio virus.

The study was reported by Dr. Richard F. Baker, Fred Rapp, Elizabeth A. Grogan and Dr. Irving Gordon of the school's department of medical microbiology.

Science News Letter, May 11, 1957

## METEOROLOGY

**Weather Forecasters Will Use Radar Pictures**

➤ WEATHER FORECASTERS will soon pay more attention to radar pictures of clouds and rain and less attention to the movement of cold fronts and warm fronts, Dr. Myron G. H. Ligda of Agricultural and Mechanical College of Texas predicted.

He told the American Meteorological Society meeting in Washington larger radar networks than those now available were needed before weathermen would have sufficient radar coverage.

One way to increase radar knowledge of the sky was outlined by Dr. M. P. Langleben of the stormy weather group, McGill University, Montreal, Canada, where a method of making constant level radar pictures of cloud structure was developed.

A narrow radar beam sweeps the sky at gradually increasing altitudes until the whole volume of the atmosphere within 200 miles has been covered. This information is stored photographically or in an electrostatic memory tube, then a picture of all clouds at any given level is drawn from the stored material and presented. This can be done for any level of the atmosphere.

Present radar sets do not need to be altered, since the new memory device can be attached to them.

Associated with Dr. Langleben in the development were Drs. J. S. Marshall, T. R. East and K. L. S. Gunn, also of McGill's stormy weather group.

Science News Letter, May 11, 1957

# CE FIELDS

## PUBLIC HEALTH

### Report Danger of Foods Preserved by Antibiotics

► THE USE of antibiotics to preserve meat and other foods has opened up many possibilities to industry, but the practice may be dangerous to consumers, according to a report by Drs. Barbara Read, Herbert S. Goldberg, and R. N. Goodman, University of Missouri, Columbia.

Animals fed a prolonged diet of food treated with small doses of the antibiotic streptomycin became resistant to the drug, the researchers reported to the Society of American Bacteriologists meeting in Detroit.

Mice were given low-level doses of streptomycin varying from zero up to 20 micrograms per day in their drinking water. After a month of this diet, the naturally existing microorganisms in the bodies of one-fifth of the test animals getting the highest dosage had become as much as five times more resistant to the drug.

Guinea pigs were also used and were fed a diet including greens that had been treated with a streptomycin dip for preservation purposes. Microorganisms taken from their throats also showed increased resistance.

The experiment was one of many aimed at studying the public health aspects of antibiotic residues from non-medical uses such as food preservation, plant disease control and animal nutrition, the investigators said.

Science News Letter, May 11, 1957

## GEOPHYSICS

### Map Earth's Magnetism At Remote Pacific Isles

► THE EARTH'S MAGNETISM will be mapped at three remote Pacific islands by at least eight technicians.

Dr. Martin J. Vitousek, scientist-owner of the trading schooner, *Fiesta*, will shuttle among the islands in the central Pacific supervising and delivering supplies. Jarvis Island is the least attractive but most important of the three he will visit. It lies precisely at the intersection of the earth's geographic equator with the magnetic equator. The magnetic equator roughly parallels the geographic, but meanders north and south of it.

Jarvis is a saucer-shaped island of sand and coral, about two miles long and a mile wide, 1,200 miles south of Honolulu. Birds are the only permanent residents. As the climate is very dry, the two men stationed there will purify sea water with solar stills.

Palmyra Island, 400 miles north northwest, has plenty of rainfall and vegetation. Otto Hornung, an island hermit since

World War II, has been hired as one of the staff for Jarvis. Mr. and Mrs. Jack Wheeler of Honolulu are being assigned to Palmyra for at least a year.

Fanning, which is nearly in line between Palmyra and Jarvis, is the largest of the three islands and has a small permanent white population, mostly Australians. The chief product is copra.

The *Fiesta* will carry not only supplies but sometimes replacements for the technicians who will be operating Coast and Geodetic Survey instruments on the islands. The magnetism study is part of the International Geophysical Year.

The United States owns Palmyra and Jarvis Islands, and Britain owns Fanning Island. The Survey, part of the U. S. Department of Commerce, has a permanent magnetic observatory at Honolulu and is staffing two other temporary observatories on Guam and Koror with its own personnel.

The *Fiesta* is a 72-foot schooner built of teakwood at Hong Kong in 1932. She sleeps ten and has a Diesel auxiliary.

Science News Letter, May 11, 1957

## MEDICINE

### Test Spots Undetected Cancers of the Uterus

► A SIMPLE and highly accurate technique for spotting undiscovered cancers of the uterus has been developed by Drs. Daniel G. Morton, Jerry G. Moore and Norman Chang of the department of obstetrics and gynecology, University of California at Los Angeles.

The method involves inserting a tiny tube no larger than the lead in a lead pencil into the uterine cavity. A teaspoonful of sterile salt water is injected through the tube to bathe the uterine cavity and is drained off and analyzed. The cell material found in the fluid is then stained and examined under a microscope to detect any cancerous cells.

The test is a modification of the widely used vaginal smear test, developed by Dr. George N. Papanicolaou and others, which has been more than 90% accurate in detecting early cancer of the cervix or neck of the uterus.

However, with cancers of the body of the uterus, the standard smear tests miss 40% to 60% of the time. As a result, the cancers often remain undetected until it is too late for cure.

Used on 673 cases, the new technique spotted 92.3% of confirmed cancers. Only about half or 47.6% of these positive cases had been diagnosed by the vaginal smears.

The average physician can take the fluid sample and it would be very helpful in establishing the correct diagnosis in cases of irregular menstrual bleeding, Dr. Morton said.

The work was reported by the American Cancer Society which supported the research along with the University's Committee on Cancer Research.

Science News Letter, May 11, 1957

## ENDOCRINOLOGY

### Pineal Gland Hormone Believed Demonstrated

► EVIDENCE for the existence of a hormone of the pineal gland, a poorly understood organ imbedded in the brain at the center of the head, has been reported by Dr. Wilbur B. Quay of the University of California.

Dr. Quay told the American Association of Anatomists meeting in Baltimore that he has detected that certain lipids, or fatty substances, tend to accumulate near blood vessels that run through pineal tissue.

It appears these lipids may travel into the blood vessels much as internal secretions of the endocrine glands circulate through the body. The substances may be hormones or associated with hormones, Dr. Quay said.

Until recent years the pineal gland was thought to have no function. Lately it has been suspected of having endocrine functions, but no secretion emitted by the organ had ever been detected.

In addition to finding the lipids near the blood vessels, Dr. Quay found a progressive increase, with age, of a type of pigment found in old age in various metabolically active tissues, such as the liver and heart.

"The presence of this pigment is a strong indication of metabolic activity in the pineal organ," Dr. Quay said.

The scientist also reported experiments with radioactive phosphorus showing the pineal body has a high metabolic activity.

Tumors of the pineal body are frequently associated with premature sexual development in children. They are most common when sexual maturity is being attained, and are three times as frequent in males as in females. Some scientists believe the pineal may oppose the pituitary gland and reproductive development until the arrival of puberty.

Science News Letter, May 11, 1957

## BIOLOGY

### Grow Typhus Organism In Laboratory Culture

► EVENTUAL CONTROL of typhus and Rocky Mountain spotted fever may result from the first successful growth of an organism on a lifeless medium.

Dr. R. A. Consigli and a group of associates at the University of Kansas reported to the Society of American Bacteriologists meeting in Detroit, that they have grown *Rickettsiae*, the organisms responsible for such diseases as typhus and Rocky Mountain spotted fever, on B-vitamins and other foodstuffs normally required by most animal cells.

On the scale of living organisms, *Rickettsiae* are intermediate organisms between bacteria and viruses. Their cultivation in the laboratory medium now eliminates the need for fertile chicken eggs and animals formerly used to grow the organisms.

Science News Letter, May 11, 1957