RADIO ASTRONOMY

Other Elements Sought In Interstellar Space

➤ UNSEEN MATERIALS in the space between the stars will be searched for by giant radio telescopes now being built or planned.

Scientists attending the American Astronomical Society meeting in Columbus, Ohio, learned of the new, exciting possibilities from studying the heavens by radio waves rather than light waves.

Large receivers have been used to pick up radio waves of two gases in interstellar space, hydrogen and deuterium, hydrogen's heavy twin. They were found at a wavelength of 21 and 92 centimeters, respectively. (See SNL, Nov. 19, 1955, p. 323.)

Other materials for which search will be made include a carbon-hydrogen combination at a wavelength of several centimeters and an oxygen-hydrogen grouping at about ten centimeters.

Radio astronomers are also searching for individual objects they can isolate by their absorption of certain energy bands in radio wavelengths, just as optical astronomers now analyze a star's composition by absorbed light. Only one has yet been discovered. (See SNL, Feb. 11, p. 94.)

Radio waves in the middle of standard AM broadcasts have wavelengths of about 1,000 feet. Those used by radio astronomers in looking for now-hidden materials in interstellar space are measured in inches.

One new radio telescope, which will be about 700 feet long and 75 feet high when completed in two years, is being constructed at Ohio State University. The scale model built on a rooftop to test design principles has worked so well it is now being used as a research instrument, Dr. John D. Kraus reported to the meeting.

Science News Letter, April 7, 1956

EVOLUTION

Fish Was First To Walk the Earth

➤ FISHES, not amphibians, were the first to walk the earth. It is not at all likely that sea animals suddenly developed legs on which to walk the earth so they might leave a dried-up pond to reach water.

Doubt of this theory is expressed by Dr. Gordon Gunter, director of the Gulf Coast Research Laboratory, Ocean Springs, Miss., in *Science* (March 23).

A slow and gradual evolution of legs is much more plausible, Dr. Gunter said.

The process probably was started by fish that used their fins not as legs but merely as props to hold them up while the buoyancy of the water supported the weight of the body.

Several hundred species of modern fishes do walk under the water with the use of their fins. Later, as the fins grew stronger, the fishes may have skittered about and made elementary walking movements in the shallows. Next probably came short invasions of the dry land and movements along the shore.

The movement from sea to land was aided by the fact that all enemies of fish came from the water. No birds stood on the shore to impale a fish in the shallows. No mammals lived on land to pounce upon the clumsy water creature emerging from his natural element.

The land held only insects and other such arthropods that provided prey and food for the fish.

In the course of evolution, the fins lost the fin rays, their bases became enlarged and eventually they developed into the legs of four-footed animals. Meanwhile, of course, the lungs were developing.

His theory, Dr. Gunter comments, eliminates the necessity for explaining how discontinuous and catastrophic events such as the drying up of lakes, could have led to the sudden origin of limbs that, at the very outset, had to be strong enough for land travel.

Science News Letter, April 7, 1956

ANIMAL PHYSIOLOGY

Cosmic Rays No Harm To Monkeys' Behavior

➤ DANGER to the men flying in outer space may not be as great as has been feared.

Worry over one of the hazards of space flights, exposure to primary cosmic radiation, is lessened by tests made in Sault Sainte Marie, Mich., on Java monkeys. Four of these primates were given a series of behavior tests before and after two of them were exposed to cosmic rays at altitudes above 90,000 feet for a total of 62 hours.

Scientists have been concerned over sending pilots up to altitudes where low-energy, heavy nuclear primary cosmic rays are found, because theoretical calculations have indicated such radiation may have significant biological effects.

Test pilots are already reaching altitudes where they are exposed to this type of radiation. The monkeys, however, returned from their 62-hour stay in the stratosphere showing no ill effects.

They showed no serious loss of weight. They ate peanuts and raisins with just as much appetite as the monkeys who did not go aloft. They could sit up, move around, eat, see, hear, hop and demonstrate reflexes with no striking abnormalities either just after the flight or four months later.

On color vision tests and behavior tests, the monkeys who made the flight did just as well or sometimes a little better than the others.

The experiment, reported in the *Journal of Comparative and Physiological Psychology* (April), was conducted by Drs. Harry F. Harlow and Allan M. Schrier of the University of Wisconsin and David G. Simons of the Space Biology Branch, Aero Medical Field Laboratory, Holloman Air Force Base, N. Mex.

Science News Letter, April 7, 1956

IN SCIEN

ASTRONOMY

Jupiter's Mass Was Once 20 Times Higher

➤ JUPITER'S MASS was once 20 times as great as now, calculations with a giant electronic "brain" indicate.

Dr. Eugene K. Rabe of Cincinnati Observatory told the American Astronomical Society meeting in Columbus, Ohio, that the computations lend "significant" support to the theory that the planets all had much larger masses early in their history.

Jupiter's excess mass was lost gradually by a process of evaporation, Dr. Gerard P. Kuiper of Yerkes Observatory, Williams Bay, Wis., has suggested. From dynamical considerations, he estimated Jupiter long ago had about 20 times its present mass.

Testing the effects such a massive planet-in-making would have on the orbits of asteroids, Dr. Rabe found an explanation for the puzzling Kirkwood gap, where no asteroids are found. The much-enlarged Jupiter, as it decreased in mass, would sweep the minor planets from certain orbits.

This, Dr. Rabe said, is the "strongest independent support" yet found to confirm Dr. Kuiper's theory that Jupiter was once 20 times more massive.

Science News Letter, April 7, 1956

CHEMISTRY

Chemist to Salvage Nuisance Fission Products

➤ ATOMIC POWER is a chemical business.

Intense radiation is so successful in producing polymerized materials and in sterilizing drugs and pasteurizing foodstuffs that these may become the most important functions of atomic reactors in the future, Dr. Willard F. Libby, U. S. Atomic Energy Commission member, forecast at the American Power Conference in Chicago.

Tremendous quantities of waste heat from atomic reactors could be economically put to work by chemical plants now buying fuel to make their chemical operations go, Dr. Libby believes. He stressed the need for good chemists in the employ of industry.

Opportunity for developmental work in atomic energy, both for power production and for better use of fission products now chiefly a nuisance, will increase both in America and in other parts of the world.

He pointed out that the "break-even" point in "competitive A-power very likely will be attained sooner in Europe and in Asia than in the United States; this situation is tailor-made for an industry which still requires some developmental work and "reduction to practice."

Science News Letter, April 7, 1956

CE FIELDS

PSYCHOLOGY

Intelligence a Handicap In Learning Some Things

➤ HIGH INTELLIGENCE can actually be a handicap in certain kinds of learning, Dr. Charles R. Brown of Johns Hopkins University and Dr. Arnold M. Cooper of the Claremont Graduate School, Claremont, Calif., reported at the Eastern Psychological Association meeting in Atlantic City, N. J.

Subjects for their experiment were inmates of a minimum security prison. Half the men had scores of about 60 on a standard intelligence test. The other half, scores of about 120.

They were required to learn the order of presentation of a series of colored squares so that, when they were shown one square, they would try to name the one that would come up next.

For half the men, including equal numbers of high and low intelligence, the squares were mounted on a white background. For the rest, they were mounted on larger squares of four different colors, arranged in random order.

When the colored squares were mounted on plain white ground, the brighter men had a big advantage in learning the order of presentation. But when they were mounted on colored cards, the advantage was wiped out. The bright men did no better than those of lower intelligence.

The more intelligent men naturally took in the whole situation more effectively and this interfered with learning when the background colors conflicted with those they were supposed to learn, the scientists speculated.

Science News Letter, April 7, 1956

PSYCHOLOGY

Individual Ability No Guide to Group Output

➤ THE OUTPUT of a small work group depends on the make-up of the group rather than on the individual characteristics of the members.

This applies to such differing groups as a nine-man infantry rifle squad in the Army and a six-man work group in a factory, according to reports to the Eastern Psychological Association meeting in Atlantic City, N. J.

The study of Army rifle squads was reported by Drs. M. Dean Havron and William A. Lybrand of Psychological Research Associates, Washington, D. C.

A rifle squad's success in combat should not be attributed to the individual scores of members in rifle practice. What is important is the ability and personality of the squad leader and his knowledge of the squad and the individual characteristics of members. Confidence of the men that their leader adequately fills the role expected of him is also important in predicting what the squad will do when they go into battle.

What is important in determining the work output of an industrial group is whether the group is tight-knit and cohesive enough to be properly called a group. Personality characteristics of individuals in the group and their satisfaction with the job did not turn out to be important in affecting the speed of work.

This study was reported by Dr. Elliott R. Danzig of the Institute for Research in Human Relations, Philadelphia, and Dr. Eugene H. Galanter of Harvard University.

Science News Letter, April 7, 1956

ASTRONOMY

New Studies on Solar System "Juniors"

➤ NEW STUDIES on "junior" members of the solar system, meteors and comets, were reported to the American Astronomical Society meeting in Columbus, Ohio.

Dr. Harold C. Urey, University of Chicago's Nobel Prize winning physicist, said that chemical heating of comets by free radicals with explosion-like violence led to formation of the tiny fragments picked up on earth as meteorites.

More comets probably exist unseen in the solar system than have ever been detected, Prof. Nicholas T. Bobrovnikoff of Ohio State University told the astronomers. Comets are condensation of meteoric matter moving around the sun, influenced by its gravitation and radiation.

Craters on the moon and many circular craters on earth were probably caused by meteors smashing into the surface, Dr. C. S. Beals of the Dominion Observatory, Ottawa, Canada, reported. Studying air maps of 1,800,000 square miles in Canada, covering about half the country, he found that meteor craters outnumber volcanic ones five to one.

Many more meteor-caused craters await discovery, Dr. Beals' preliminary survey indicated.

Science News Letter, April 7, 1956

BIOCHEMISTRY

Find Drugs for Germs That Defy Antibiotics

➤ DRUGS that may conquer some of the big germs that defy penicillin and other antibiotics have been made by Dr. Robert M. Herbst and associates at Michigan State University.

One of the new drugs is effective against trichomonal infections of both man and animals. This drug is a complex chemical called imoctetrazoline for short. Another of the new drugs, Dr. Herbst hopes, will prove effective against the amebas that cause amebic dysentery.

Science News Letter, April 7, 1956

ASTRONOMY

Use Satellite to Learn Nature of the Universe

➤ ARTIFICIAL EARTH satellites to be launched next year could be used to learn the nature of the universe beyond the range of present telescopes, Dr. W. A. Baum of Mt. Wilson and Palomar Observatories, Pasadena, Calif., told the American Astronomical Society meeting at Ohio State University.

The instrument for the required observations need not be much larger than a pack of cigarettes, and its total power requirements less than a watt, he said.

As the satellite sweeps in its orbit around the earth, Dr. Baum noted, the instrument would sometimes view the earth's atmosphere, sometimes the light of galaxies billions of light years distant from the Milky Way in which the solar system is located.

By observing this distant light in many colors and telemetering the information to earth, scientists could learn how much it contributes to the total light received from a moonless sky.

This is of "fundamental importance to the choice between possible models of the universe," Dr. Baum said.

Glow of the earth's atmosphere normally dwarfs the light from far-distant galaxies, Dr. Baum pointed out. Learning the brightness and color of the extragalactic sky could lead to a choice between various models of the universe and might also reveal the "nature of the cosmos beyond the range of present telescopes."

Science News Letter, April 7, 1956

MEDICINE

Antibiotic Stops One Leukemia in Mice

➤ AN ANTIBIOTIC, or so called mold remedy, with anti-leukemia power in mice, has been discovered by Dr. B. A. Rubin of Baylor University College of Medicine and M. D. Anderson Hospital, University of Texas.

The antibiotic is polymyxin. It causes the complete disappearance of transplanted leukemia in mice. It also makes the treated mice immune to further transplants of leukemia.

Its effect on leukemia developing spontaneously in either mice or humans is not known. Dr. Rubin is testing a variety of antibiotics for possible anti-leukemia action in mice.

Immunty to leukemia in mice can be broken down by various cancer-causing chemicals, Dr. Rubin and Drs. Arthur Kirschbaum and K. Ida have found.

Mice that normally resist leukemia transplants lost this resistance when their skins were painted with cancer-causing methylcholanthrene.

The findings were announced by the American Cancer Society, which supports the research.

Science News Letter, April 7, 1956