

PHYSICS

Great Store of Energy in Empty Space of Universe

► THE EMPTY space of the universe between the stars and the planets contains 50,000 times as much energy per unit volume as the uranium used in the atomic bomb. Yet there seems to be no way to use it, for it is energy as absolutely frozen as the temperature of outer space.

This problem is a prime unsolved mystery of science that Dr. Paul Scherrer, Zurich physicist, posed at the dedication of the new General Electric Research Laboratory in Schenectady, N. Y.

The immense content of energy of empty space is a consequence of the zero point energy of radiation, involved in the quantum theory so fruitful in explaining the atom. The amount of energy in space is equivalent to some 700 million million kilowatt hours per cubic foot.

"If it really exists," Dr. Scherrer told the scientists, "it should by its mass alone produce enormous gravitational effects." All the matter in the universe would be concentrated in a space about equal to the orbit of our moon. Since this is not the case, the present theories are inadequate and as Dr. Scherrer pointed out this is a challenge to further research.

Science News Letter, October 21, 1950

NUCLEAR-PHYSICS

AEC Has No Plans to Heat Towns by Atomic Energy

► THE Atomic Energy Commission has no plans for using our atomic piles to heat nearby buildings or entire towns as is reported being planned for the Harwell piles at Britain's atomic energy establishment.

Spokesmen for the AEC said that our plans are concentrated on direct conversion power piles, such as the submarine ship reactor, that will change atomic energy directly into commercial or useful power.

The big pile at Hanford, our largest atomic installation, was built to be cooled with water, not air. It would not now be economical to convert this pile to air cooling, AEC officials state.

Since the Brookhaven pile is air cooled, however, it would be possible to convert some of the energy from the pile for heat purposes if desired.

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GEOLOGY

Fourth Large Glacier in Sierra of Pleistocene Era

► DISCOVERY of evidence that a large glacier descended both the east and west slopes of the Sierra Nevada mountains approximately 1,000,000 years ago was announced by Dr. William C. Putnam, prof-

essor of geology at the University of California at Los Angeles.

Three previous glaciers have been known by geologists to have been active in the Sierra in Pleistocene times. This is the fourth—and largest—that has been found.

This quartet of California glaciers, says Dr. Putnam, is not related to ice advances in the eastern and middlewestern United States.

The U. C. L. A. geologist made his discovery in a tunnel being driven through the mountains in the Owens Gorge, near Bishop, Calif., by the Los Angeles Department of Water and Power engineers.

Nearly 400 feet of volcanic ash covered the glacial deposits, revealing periods of active volcanism between the various ice advances.

This part of the eastern Sierra is one of the most actively-faulted in the world. Hundreds of fault marks are to be found in this region which was a highly volcanic area in the recent geologic past. Deposits left by the final ice advance have been cut by faults, showing that this activity is even more recent than the California ice age.

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AERONAUTICS

Pilot's License after Ten Hours Flight Time

► YOU can learn to fly a plane and earn your government-approved license after only ten hours of flight training. That is the promise put forth in Urbana, Ill., by three psychologists who are also pilots.

They have already shown that some students, but not all, can pass their CAA flight test after ten hours of instruction. Secret of the short learning period is use of a Link trainer specially modified to simulate conditions usually encountered by small, light planes in flight.

Link trainers were originally designed to teach instrument flight procedures. They are much cheaper to operate than a plane.

To boost the percentage of persons earning their licenses after ten hours of flight time, the psychologists recommend further research into more extensive use of flight training aids, more training of instructors in Link teaching methods and "intellectualizing" of a maneuver by a student before performing it either in flight or in a Link.

Dr. William G. Matheny, Ralph E. Flexman and Edward L. Brown of the Institute of Aviation at the University of Illinois conducted tests on 47 students, half of whom received the regular course.

Final CAA flight tests for license were given by two sets of examiners. Of the Link group, 43% passed while only 19% of the control group passed the CAA examiners. Seven pilots who were already licensed took the test without the knowledge of the examiners. Only three, or 43%, of them passed.

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IN SCIENCE

MEDICINE

One-Fourth More Premature Babies Might Be Saved

► ONE-FOURTH of the premature babies that now die each year might be saved, at no added cost, if the babies were cared for in special Premature Centers or in hospitals having separate premature nurseries with a separate qualified nursing staff and supervision by pediatricians.

This is the conclusion of a study of mortality and cost experience with premature infants in Illinois in 1948 reported by Dr. Henrietta Herbolsheimer, medical administrative assistant to the director of the Illinois Department of Public Health, in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Oct. 14).

Even the cost of care in the hospitals with special equipment and staff and the cost of transportation in special ambulances to these hospitals does not exceed the cost of care in other hospitals, she found.

Until premature births can be prevented, Dr. Herbolsheimer suggests that the pattern of care provided in the special hospitals should be aimed for. At least, she points out, the idea that this pattern would save one-fourth the babies now lost should be put to test by accumulation of more data.

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MEDICINE-PHYSICS

Chemical May Be Antidote For Uranium Poisoning

► A CHEMICAL that shows promise of being an antidote for uranium poisoning, hazard facing atomic energy plant workers unless suitable precautions are taken, has been discovered by scientists in the department of radiation biology at the University of Rochester School of Medicine and Dentistry in Rochester.

The compound is a polyphosphate. When albino rats were put on diets containing a uranium nitrate compound, 10 out of 25 were dead in 21 days and 13 of 25 were dead at the end of 45 days. But when 25 rats on the same uranium-containing diet were given two polyphosphate injections a day for five days, none had died after 21 days and only one at the end of 45 days.

The experiment is a "preliminary" one, the scientists pointed out in a report to the American Physiological Society. But the polyphosphate seemed to have "marked antidotal properties" in the uranium poisoned rats.

Scientists who made the discovery are Drs. Elliot A. Maynard, Harold C. Hodge and William L. Downs.

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E FIELDS

MEDICINE

Cortisone for Arthritis By Mouth, Not Muscle

► ARTHRITIS patients lucky enough to get cortisone to banish their aching, painful stiff joints may in future be able to take this anti-rheumatism remedy by mouth instead of having it injected into their muscles.

Trials of cortisone pills in four patients showed that this form of the medicine gives results as good as are obtained with injections and as good as with ACTH, Drs. R. H. Freyberg, C. T. Traeger, C. H. Adams, T. Kusou, H. Wainerdi and I. Bonomo of the Hospital for Special Surgery and Cornell University Medical College report in the journal, *SCIENCE* (Oct. 13).

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ZOOLOGY

Mice Like Peanut Butter Better Than Cheese

► *Mus musculus domesticus* likes cheese, but he likes peanut butter and rolled oats better.

Now *Mus musculus domesticus* is not, strange as it may seem, a domesticated muscular moose—although this is not to say muscular moose don't like peanut butter too. But the fact is, *Mus M. domesticus* is the ordinary northern house mouse.

And with the revelation that peanut butter rates higher than cheese with mice, the U. S. Fish and Wildlife Service yanked the props right out from under an old American tradition.

The debunking of cheese took place at a national rat (and mouse) control conference in Baltimore, Md., sponsored by the Fish and Wildlife Service and the Baltimore, Md., Health Department.

Put a dab of peanut butter on a mouse trap and then cover the entire trap with a handful of oats, said Fish and Wildlife Service scientist Walter W. Dykstra. The mice will choose this smorgasbord fare without hesitation over cheese.

Mr. Dykstra gave other unusual data on the No. 1 American house pest. Mice, he said, live out their lives within 10 to 20 feet from the place where they are born.

They eat 20 to 30 times a day, yet consume only about one-tenth of their own body weight in food in 24 hours. Thus, to poison mice effectively, a chemical must be extremely potent and must be widely distributed about the house, he said.

A mother mouse will bear from 30 to 57 offspring in a year. Her young will mature within three months. The inevitable result is that a mouse family is apt to be a large affair.

Historically, mice are among the world's most ancient pests. They bothered Asiatic tribes 4,000 years ago, Mr. Dykstra said. Aristotle complained of mice, yet the Greeks erected statues to them because they chewed the straps from the enemy's armor.

And of all the inventions offered each year to the U. S. government, the one which comes in greatest numbers is the better mousetrap.

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BIOLOGY

New Micro-Guinea Pigs for Research

► SCIENTISTS now have a new kind of guinea pig for research in which living creatures are needed. This new guinea pig is microscopic in size and is actually not a guinea pig but a microorganism something like the algae which grow on stagnant ponds. Name for this group or class of organisms is chryomonads. Studies with them were reported by L. Provasoli and S. H. Hutner of the Haskins Laboratories, New York City, at the National Academy of Sciences meeting.

Another alga, a flagellate, *Euglena gracilis* by name, needs the new anti-anemia vitamin B₁₂. The water of a pond on which this *Euglena* develops regularly contains B₁₂ throughout the year, William J. Robbins, Annette Hervey and Mary E. Stebbins of the New York Botanical Garden found. They believe from their studies that the synthetic activity of microorganisms, especially bacteria and actinomycetes, and not that of higher plants, is the original source of vitamin B₁₂ in nature.

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MEDICINE

100 Times More Potent Pain-Killer Synthesized

► A PAIN-KILLER 100 times more powerful than the procaine your dentist uses as a local anesthetic was announced at the meeting in Schenectady, N. Y., of the National Academy of Sciences.

This and other new local anesthetic drugs were synthesized by R. O. Clinton and F. P. Luduena of the Sterling-Winthrop Research Institute at Rensselaer, N. Y.

They were made by substituting certain chemical groups in the nucleus of the procaine molecule and tested by the sciatic nerve block method in guinea pigs.

With the exception of one, the orthomethoxy compound, the new chemicals appeared to be less toxic than procaine on an activity basis.

They show a "very favorable" ratio between activity and irritation. For example, the ortho-propoxy compound is about 10 times as active as procaine and only twice as irritating.

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GENERAL SCIENCE

Unesco Grants Aid Science Information Centers

► THE CREAM of the world's scientific developments will soon be more easily available to scientists in the Far East and in South America.

Two grants, out of a total of \$1,000,000 announced by UNESCO, the United Nations Educational, Scientific and Cultural Organization, will be used to set up information centers for scientists. One of these will be in India to serve the Far East, and the other is planned for Mexico to serve South America.

Much of the rest of the money authorized will be used to combat illiteracy and to raise the standard of living of people in 12 countries in Asia, North and South America and Africa.

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MEDICINE

Malignant Cancer Requires Bunch of Cancer Cells

► A CANCER that grows and threatens life appears at a location where "a critical number of cancer cells are bunched together," but a single cancer cell surrounded by normal tissue cannot start malignant growth.

This theory of the origin of cancer was presented by J. C. Fisher and J. H. Hollomon of General Electric Research Laboratory at the meeting in Schenectady, N. Y., of the National Academy of Sciences.

The idea behind this theory is that individual cancer cells in normal tissue are bathed in normal chemistry. A cancer cell surrounded by others of its kind, on the other hand, is bathed in abnormal chemistry where malignant growth is no longer inhibited.

This critical size idea, the scientists stated, "gives new life to the mutation theory of cancer." According to the mutation theory, normal cells change into cancer cells and these continue to reproduce themselves as cancer cells. But this theory, the scientists pointed out, has had difficulty in explaining why there are many more cancers in middle aged and older persons than in young persons.

Mutation rates should remain substantially constant with time, the scientists declared. When the critical size idea is introduced, however, a constant rate of mutation leads to a relationship in which the number of cancers in a population varies with the age of the population raised to the power of the number of cells in a critical size colony.

Experiments with cancer-causing chemicals and observations concerning the location of cancers that have spread from other cancers support the critical size concept, the scientists stated.

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