

PHYSICS

U. S. to Build "Pool" Reactor in Geneva**See Front Cover**

► THE UNITED STATES will build a "swimming pool" nuclear reactor at Geneva, Switzerland, for demonstration at the United Nations International Conference to be held there in August.

The research reactor will be modeled after one of the types successfully operated at the Atomic Energy Commission's Oak Ridge National Laboratory and shown on the front cover of this week's SCIENCE NEWS LETTER.

The reactor is emersed in a pool of water which affords an effective safety shield against radiation.

Qualified scientists and technicians at the August 8-20 meeting will be allowed to operate the machine, using the controls to start, maintain and stop a nuclear chain reaction within the reactor. During these experiments, known as criticality tests, the familiar blue glow of the irradiated fuel elements will be visible under the water.

The project for the Geneva Conference will be carried out by Oak Ridge National Laboratory, which is operated for the AEC by the Carbide & Carbon Chemicals Company.

The fuel will be fuel grade uranium enriched in isotope 235 to about 20%. About five kilograms of U-235 will be required.

The reactor will be tested at Oak Ridge and then dismantled and shipped to Geneva. The reactor and its fuel would be at all times under the control and custody of the AEC.

It will be housed in a temporary prefabricated metal building designed especially to enable the delegates and visitors at Geneva to see the reactor in operation.

The "swimming pool" feature will be a tank 10 feet in diameter and 20 feet deep, in which the entire reactor is immersed. Specially purified water is used for the shielding. Health and safety control will be built into the reactor.

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PHYSIOLOGY

X-Rays Show How Gland Affects Bone Growth

► THE PART played by the pituitary gland, tiny gland at the base of the brain, in normal growth, particularly of the skull and face, was demonstrated by a series of X-rays of pug-faced young rats.

The rats were photographed repeatedly over a period of eight months starting when they were 28 days old. The study was made by Drs. Henry R. Frank and C. Willet Asling, anthropologists of the University of California School of Medicine, and reported to the meeting of the American Association of Physical Anthropologists in Philadelphia.

On the first day of the experiment, the

pituitary gland was removed from 16 of the 30 rats.

By that time, the width of the skull had already reached adult size. Skulls of the operated rats did not change in proportion of width to length, since loss of the pituitary cut short the length-wise growth of the skull.

The rats that kept their pituitaries, however, continued to grow in skull length, causing a drop in width-length proportion from an initial 81 to below 70.

In the normal rats, the facial part of the skull grew faster than the rest. Initially shorter, it became equal in length by the 55th day of age and after that was longer than the rest. In the rats that lost the pituitary, the facial part of the skull remained shorter than the rest.

Such repeated X-rays, the anthropologists explained, can be used to show the effects of administration of pituitary extracts on growth.

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MEDICINE

Clinics for Childless Have 23.2% Success

► A 23.2% success has been achieved by clinics helping childless couples have wanted children. Of 13,051 such couples studied and treated in 21 clinics during a period of 28 years, 3,026 pregnancies occurred.

The results were reported by Dr. Mary Steichen Calderone, medical director of the Planned Parenthood Federation of America, New York, at the meeting of the American Academy of General Practice in New York.

These clinics also make infertility studies of parents who want to adopt a child. Such studies, Dr. Calderone said, are now required by most adoption agencies.

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ASTRONOMY

Planet Pluto Believed Smaller Than Estimated

► PLUTO, MOST distant of the planets of the solar system, may be smaller than estimated, Prof. Dirk Brouwer, director of the Yale Observatory, declared in delivering the Royal Astronomical Society's George Darwin lecture and receiving the society's gold medal in London.

Electronic "brain" calculations of the orbits of Jupiter, Saturn, Uranus, Neptune and Pluto around the sun were made, and gravitational attractions of Pluto on Uranus and Neptune indicate that Pluto's mass is about that of Venus, about eight-tenths that of earth. However, a much smaller mass is suggested by direct observations through the Palomar 200-inch telescope.

"The development of high-speed calculators in recent years," Prof. Brouwer pointed out, "has opened up possibilities for the study of problems in celestial mechanics that were beyond the dreams of our predecessors of even one generation ago."

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IN SCIENCE

PUBLIC SAFETY

Academy Begins Study On Radiation Danger

► THE DANGER of atomic radiation to life upon the earth, including people, will be determined by an inquiry the National Academy of Sciences will make with Rockefeller Foundation financial support.

Wide scientific differences exist as to the dangers of H and A-bomb radiation, debris from atomic power reactors and other radiation hazards of the atomic age.

Atomic tests have been criticized from both within and without the United States as a menace to populations now living and a future danger through effects on germ plasm upon generations yet unborn.

The Atomic Energy Commission, which pledges cooperation in the inquiry, has spent \$165,000,000 in the past five years on the radiation problem. The cost of the NAS inquiry is not announced.

Information now kept under secrecy wraps, such as the amount of atomic contamination of the atmosphere, will be made available to the scientific committee when appointed.

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AERONAUTICS

No Time to See At Supersonic Speeds

► THINGS THAT may affect a pilot's ability to see range from common hay fever to supersonic speeds, Dr. Louis R. Raymond of East Orange, N. J., told the Aero Medical Association meeting in Washington.

Supersonic speeds, he said, cause a build-up of compression waves in the air. The optical density is thus increased to give a new refraction to light. This results in displacement of objects.

Flying at supersonic speeds gives another hazard. Normal reaction time and time required for visual perception by an alert person is considered to be one second. Flying 900 miles per hour, a plane travels 1,841 feet in a second. There may be another plane traveling at the same speed in the opposite direction. The pilot not only needs time to see the plane but time to make a decision and more time to change control of his plane.

"It is apparent," Dr. Raymond said, "that before a pilot can recognize the object it is in his cockpit, by the time he can do anything about it, the plane is a mile or more past him."

"How inadequate," Dr. Raymond concluded, "is human vision at the speed of rockets estimated at 25,000 miles per hour, or seven miles per second."

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CE FIELDS

PHYSICS

Discover Beryllium Made by Cosmic Rays

► DISCOVERY OF another radioactive substance created in the upper air by action of cosmic rays gives science a new tool for studying what happens in the atmosphere.

Beryllium 7 is born of the star-like bursts of high energy radiation from outer space smashing into and transmuting atoms of nitrogen and oxygen at about nine miles above the earth.

This was reported by Dr. James R. Arnold and H. Ali Al-Salih of the University of Chicago's Institute of Nuclear Studies in *Science* (April 1).

Two other isotopes induced by cosmic rays had already been discovered, carbon 14 and tritium, or triple weight hydrogen, and Dr. W. F. Libby, now an Atomic Energy Commissioner, has used them for radioactive dating.

The radioactive beryllium has a half-life (time radioactivity reduces to half) of only 53 days compared with radioactive carbon's 5,600 years and tritium's 12.4 years.

Measurements of beryllium in rain water show that it takes about 80 days for the radioactive material in the form of dust to descend to the level of the clouds.

There is one other sort of beryllium, isotope 10, with a half life of 2,500,000 years, that it is expected will be found to be cosmic-ray produced.

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MEDICINE

Urges Doctors Be More Sherlock Holmes-Minded

► DOCTORS SHOULD be more Sherlock-Holmes-minded, prepared at least to take a more active part in the medical aspects of unexplained deaths, a meeting of the American Academy of General Practice in Los Angeles was told.

The advice came from Dr. Charles P. Larson of the University of Washington, Seattle, who was pathologist in charge of the War Crimes Investigation for southern Germany in 1944-45.

"Who is better qualified than the physician to decide whether or not an unexplained death needs further investigation?" Dr. Larson asked. "If all coroners were physicians and had ready access to specialists in forensic pathology and allied police science, we would have an excellent medicolegal system."

He explained forensic pathology as that branch of medicine which involves the examination of tissue and other body substances in an effort to answer legal questions.

"The pathologists can and will assume their part in this investigative obligation and I'm sure that practicing physicians will do likewise."

Dr. Larson made the following suggestions to the Academy: "1. That this great body of medical practitioners become intelligently aware of the deficits in our present state laws which preclude the establishment of an adequate medicolegal investigative system and that you aid in their correction, and 2. That every doctor should assume his obligation to his community to improve every phase of the practice of medicine."

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MEDICINE

Blue Dye, Radioactive Vitamin Test Stomach

► A BLUE dye and a radioactive vitamin are among new weapons being tried in the fight on stomach cancer. Both are being used in efforts at early detection of this killer.

The blue dye, azure A, is incorporated in a cation exchange resin. It is used to tell whether or not there is a normal amount of acid in the stomach. Too little acid or none at all may be a sign of stomach cancer.

The new exchange resin dye test will be welcomed by patients. With it they do not have to swallow a stomach tube through which stomach juices would be collected for acidity tests. Instead, they swallow the resin and dye in a big glass of water. A couple of hours later a sample of urine is examined. A simple color change in it allows estimation of presence, absence or borderline secretion of acid by the stomach. Depending on the results, the patient may be given further tests for diagnosis.

The new cation exchange resin with the dye was reported by Dr. Harry L. Segal of the University of Rochester School of Medicine, Rochester, N. Y., at the Sixth National Gastrointestinal Cancer Conference held in New York under the sponsorship of the National Advisory Cancer Council of the National Cancer Institute.

Previously, a similar test had been developed using a quinine ion exchange resin.

Vitamin B-12 made radioactive by cobalt 60 is being used by Dr. Lloyd D. MacLean of the University of Minnesota Medical School, Minneapolis, in somewhat the same way to test for presence or absence of acidity in the stomach. Pernicious anemia patients do not have normal acid in their stomach and in addition they do not produce a substance, called "intrinsic factor," needed to absorb Vitamin B-12.

When normal persons are given the radioactive vitamin, it can be found in their urine, but this is not the case with pernicious anemia patients. Dr. MacLean thinks this test may show whether persons lacking stomach acid have pernicious anemia or some other condition, such perhaps, as stomach cancer.

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PHYSIOLOGY

Brain May Be Stimulated Without Causing Damage

► USING AN electric current to stimulate human brains in diagnosis and treatment might be done safely, it appears from studies at the National Institutes of Health, Bethesda, Md.

Whether the method would be effective on humans is not yet known. The tests so far, on monkeys and other laboratory animals only, indicate that the method would not cause brain damage if a bi-directional pulse were used.

At present, neurosurgeons and psychiatrists use a unidirectional or rectangular pulse to stimulate the brain. There is evidence to show that unidirectional pulses damage the brain. The tests, however, showed that the use of a bi-directional or "back and forth" pulse used for long-term stimulation did not cause damage to the brains of two monkeys.

Flashing electric lights attached to an array of electrodes deep in the monkey's brain show what part of the inner brain controls what activity of the monkey. From these stimulations, scientists are able to map the brain showing which areas control actions, thoughts and feelings.

Electric waveforms are used to stimulate and record the electrical activity on the surface of the conscious brain, as well as the inner brain. It is also an aid in diagnosing and treating mental illnesses, but is not electric shock therapy.

The results of the experiments and a description of the new noninjurious method of electric stimulation were reported to the scientific journal *Science* (April 1) by Drs. John C. Lilly, John R. Hughes, Ellsworth C. Alvord Jr., and Thelma W. Galkin.

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PSYCHOLOGY

Child Who Seems Deaf May Not Want to Hear

► A CHILD may seem deaf because he is so emotionally disturbed that he does not want to hear, Drs. A. Bruce Graham and J. Lewis Hill of the Henry Ford Hospital, Detroit, reported at the meeting of the American Academy of General Practice at Los Angeles.

A mentally retarded child may also seem deaf because sounds and speech do not interest him nor attract his attention.

A third cause for seeming deafness in a child is disturbance in perception which make sounds and speech confusing. This may afflict aphasic children in the brain-injured group.

The Detroit doctors warned parents and general practitioners that the cause of deafness, and whether it is true or apparent, should be determined in order to give the child suitable treatment and training as early as possible.

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