

## NUCLEAR PHYSICS

# New Atomic Development

**Suggestion that some day we may have a meson atomic bomb comes from the discovery that the most familiar kind of meson will produce fission of uranium.**

► ENERGY may be blasted out of the atom by a lighter weight particle than the prime "trigger" of the atomic bomb, the neutron.

Scientists attending the American Physical Society meeting in New York were told of the promise of the meson, alias mesotron, in this respect. This fundamental particle of matter has not yet been artificially produced although it is generated by the powerful cosmic rays entering from outer space the earth's outer atmosphere with tremendous energies.

Dr. John A. Wheeler, the young Princeton University physicist specializing on the structure of the atom, has figured out that the most familiar sort of meson (there are probably four or five kinds of them) will produce fission of uranium. It is reasonably probable that it will split asunder the hearts of other heavy atoms with release of energy, that is, the turning of mass into energy, which is what happens in the fission of uranium or plutonium by neutrons (the process of the atomic bomb).

This is a very exciting idea and one that may be upsetting even to the international balance of atomic power. If and when the meson is created under control and aimed at materials that it can fission, it may be necessary to bring other elements than uranium and thorium under control of national and international atomic energy commissions.

Of course, we are a long way from a meson atomic bomb or atomic power plant. The experimental demonstration of meson fission has not yet been made. We are at an earlier stage in the possible realization of meson fission than the world was in 1939 when neutron fission of uranium was demonstrated in Germany.

The least that has happened on this new atomic frontier is that, as Dr. Wheeler says, "experimental and theoretical studies of the interaction of negatively charged mesons with atomic nuclei furnish another point of advance on the elementary particle problem."

What seems to happen is that mesons are able to move in orbits around the atomic nucleus which resemble the orbits of electrons in shape but are in

size 200 times smaller. The mesons jump from one of these orbits to another and release energy which should be able to initiate a special type of fission in uranium or heavier nuclei. If they can, the energy release figures out to be about half as much again as the energy given off by uranium that is fissioned by good old reliable neutrons.

A next step in the attempts at practical meson fission will be creation of mesons in new giant "atom-smashers", five of which capable of doing so should be in operation this year.

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## AERONAUTICS

## New British Helicopter Similar to Airplane

► A BRITISH helicopter, which has just made its first flight, looks more like an ordinary airplane than other craft of this type. The resemblance is due to a normal tail with twin rudders, and stub wings.

This Fairey Aviation company's craft has the ordinary overhead horizontally

rotating lifting blades, but it has also a conventional propeller at the tip of its starboard wing. This provides forward propulsion, and also counteracts the tendency of the craft to rotate caused by the main rotor.

It is an experimental model, capable of seating four persons. Advantages claimed for the design include greater safety than with ordinary helicopters, higher forward speed, and greater comfort.

Progress is reported on a freight-carrying helicopter which has three rotors. It will be capable of carrying 24 passengers or three tons of cargo. Claims are that it will be the fastest and most powerful helicopter yet built. It has a 1640 horsepower Rolls-Royce Merlin engine.

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## MEDICINE

## Alcohol Banishes Cancer In Mice—But Mice Die

► CANCERS in mice, of the type known as lymphosarcoma, have stopped growing and begun to disintegrate after injections with small amounts of 95% alcohol, in experiments reported by Dr. Allan D. Bass and Miss Marion L. H. Freeman of the Syracuse University College of Medicine.

The effect was discovered almost accidentally. The two researchers were injecting various drugs, dissolved in alcohol, into mice with malignant tumors. They found that destruction of the



**RESEMBLES AIRPLANE**—This British experimental helicopter looks like orthodox aircraft because it has a normal tail with twin rudders and stub wings. Advantages claimed for its unique design are greater safety, higher forward speed and greater comfort. It can seat four people including the pilot.

growths was practically as great when alcohol alone was used.

The typical dose was a few drops (one-fiftieth of a cubic centimeter) of the 95% alcohol injected directly into the abdominal cavity. Weaker solutions, such as 19% alcohol, had no noticeable effect.

#### MEDICINE

## Urge Examination of Hip

► EVERY baby should have its hip joints examined before the age of six months, Dr. Vernon L. Hart of Minneapolis declared at the meeting of the American Academy of Orthopedic Surgeons in Chicago.

Prevention of life-long deformity due to a dislocated hip is the reason he urges this examination.

"The only hope for cure of these patients, suffering from congenital dislocation of the hip, is early recognition and treatment during the age period of infancy before the infants begin walking," Dr. Hart said in his paper.

Three signs that may mean the baby's hip is dislocated are: 1. Extra skin folds of the thigh; 2. shortening of the distance from the pelvis to the knee; 3. limitation of the hip in spreading apart the knees when the hip is flexed.

If any one of these signs is present, the doctor should have an X-ray study made.

The normal socket of the hip joint, Dr. Hart explained, is "deep like a cup and provides a buttress and good stability for the head of the femur or thigh bone. If the socket develops abnormally and becomes flat and saucer-like instead of a deep cavity, then the buttress for the head of the femur is absent and displacement of the head of the femur from the socket may result. The displacement may be complete or incomplete.

"Complete displacement or dislocation may occur during intrauterine development (before birth); but more often the displacement remains incomplete, or a subluxation, until the infant is about

There is just one drawback, so far as possible applicability in human medicine is concerned—a high percentage of the treated mice died.

Technical presentation of the experimental results is given in *Science*, (Jan. 30).

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six months of age or until the time the child begins walking or weight bearing. Dislocation of the hip joint is always painless and the child begins walking about the usual time or a month or two later. At first the limp is very slight and is not recognized usually until some months later, when the dislocation has increased.

"Before walking begins the only malformation is the flat socket and the displacement which is a consequence of the shallow and flat socket. After walking begins many other changes take place in the bone and cartilage of the pelvis, socket, head, neck and shaft of the femur as well as changes in muscles, tendons, capsule and ligaments. These secondary changes develop very rapidly during the first several years of life and after a short time become a very serious obstacle to the treatment of the flat socket and dislocation or subluxation. After the age of about seven or eight years of life, the secondary changes are so serious and fixed and permanent that treatment for the dislocation becomes a very difficult problem.

"The hip joint displacement which is incomplete and which is called congenital subluxation of the hip may cause no limp, pain or disability until the patient reaches the age period of middle adult life—near 40 years of age. Disability is eventually caused by irritation over the years of a weight-bearing joint which was not entirely normal from the time of birth."

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smasher revealed new radioactive forms of the precious metals, Geoffrey Wilkinson reported in the *Physical Review*, (Feb. 1).

New varieties of gold are 39.5-hour gold and 4.7-hour gold. These forms of the valuable element give off radiation. The time figures are known as their half-lives, the period of time in which they lose half of their radioactivity. Another new precious metal is 3.0-day platinum.

The scientist also described new studies with other forms of the two precious metals, including 190-day gold, 15.8-hour gold, approximately-one-day gold and 4.33 day platinum.

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#### CHEMISTRY

## Find New Types of Gold

► MOST Californians are celebrating the one-hundredth anniversary of the discovery of gold which led to the famous gold rush. But a scientist at the University of California announced that he, too, has discovered gold—at least two new varieties of the element gold plus

one new type of platinum.

The new discoveries of precious metals will not set off a new gold rush. They were made with the atom-smashing 60-inch Crocker Laboratory cyclotron at the University. Chemical separations of bombarded metal targets in the atom-