

for the study of the chukar's habits and preferences, because it offers so wide a range of habitats, from the woody heights of the Ozarks to the flat swamps of the Mississippi and Missouri river bottoms. Other states are watching the outcome of the experiments there, before undertaking large-scale chukar introductions of their own.

During the past two years, 1351 chukar partridges have been turned loose in nine widely distributed and strongly varying habitats, Mr. Nagel stated. All but 341 of them have disappeared. It is not believed that many of them have been killed by predators or died of natural causes, but it is considered more likely that they have migrated out of the territory under observation, in search of the kind of homes that suit their own ideas. They have been known to travel as much as fifty miles in a few days, in these home-seeking wanderings.

### Ideal Game Bird

The chukar partridge is considered an ideal game bird in many respects. It is far hardier than the ring-necked pheasant, enduring both cold and heat. The young chicks are able to fend for themselves at a very early age. Natural increase is rapid. After the data from the Missouri experimental releases have been properly interpreted, it is hoped that their introduction into America will become general.

Lake Meade, the artificial inland sea now forming behind Boulder Dam, is being made a good place for ducks by stocking it with food plants of the kinds they like, Robert E. Towle, of Boulder Canyon Wildlife Refuge, told his colleagues.

Three zones have to be considered: the fluctuating level of the lake itself, the shoreline subject to periodic flooding as the waters fill in and are drained out, and the dry shores permanently above water. Each habitat requires a different food-plant setup.

In contrast to the difficulty of making Lake Meade fit for ducks is the automatic benefit it has brought to the upland wildlife, especially the mountain sheep. The lake's 550-mile shoreline vastly increases the area where these animals may come and drink, and thereby multiplies their range a thousandfold.

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A large house excavated recently in Crete appears to have been inhabited within two generations of the Trojan War, thus showing the impressive style of mansions in Homer's age.

### PHYSICS

# Release Atomic Energy From Massive Thorium

## Splitting of Uranium Atom Is Followed By New and Sensational Experiments at Johns Hopkins University

**S**CIENTISTS have smashed another chemical element and made its atoms give off the tremendous quantities of energy which have long been locked within them. The element is heavy thorium.

Experiments just made with the 1,000,000-volt atom smasher at the Carnegie Institution of Washington show that high speed neutrons (neutral atomic particles) will split thorium into two parts and yield energies so enormous that they have not yet been accurately measured, Science Service was told.

This new experiment follows closely on the heels of the splitting of uranium, which also gives up its atomic energy in the splitting. Similar experiments on thorium have been done independently at Johns Hopkins University. Both American researches confirm results known to have been secured a few days ago at the Institute for Theoretical Physics in Copenhagen by Dr. R. Frisch. A report of the Frisch experiments is soon to appear in the British science journal *Nature*.

### Takes Higher Energy

The release of thorium's atomic energy differs from that of uranium in that only very energetic neutrons from lithium, with energies of millions of electron volts, seem to be able to split the element and release its energy.

For uranium, both high and low energy neutrons appear able to touch off the "trigger" mechanism inside the atom that makes it split into two parts and release energies estimated at 200,000,000 electron volts.

Carnegie Institution scientists have also made a quick survey of other heavy elements—bismuth, lead, thallium, mercury, gold and tungsten—for similar results. But no conclusive evidence of splitting has been obtained for these non-radioactive elements.

While the research scientists at Carnegie are working night and day on both of their huge atom smashers, theoretical scientists are puzzling over the meaning of the astounding experiments.

Most plausible suggestion now is that the action of neutrons on uranium and thorium is a kind of resonance phenomenon inside the nucleus of the atom. Neutrons smashing into the atom with some special energy can shake it and make it split apart. The enormous binding energy which holds it together is released in this process.

Experiments now in progress seek to find if there is some particular neutron energy which is most efficient in releasing the atomic energy. In the case of thorium, the most efficient energy lies somewhere between 400,000 and 2,000,000 electron volts. The Carnegie scientists systematically are narrowing these limits.

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### PHYSIOLOGY

## Premature Aging Ascribed To Mineral Starvation

**W**HEN an adult lacks vigor and becomes old before his time, he is probably suffering from long years of mineral starvation. This suggestion is made in the *Journal of the American Medical Association*. (Feb. 4)

Lack of sufficient calcium and vitamin D in the diet is now known to be the reason why the bones of elderly persons become abnormally porous. "Senile osteoporosis" is the name physicians give to the general demineralization of the skeleton that is commonly present in elderly persons.

This condition over a period of many years may result also in pathologic changes in the kidneys and other vital organs and thus affect the general health, the medical journal declares.

Complete studies of mineral metabolism on normal or average persons in different age groups are recommended.

Too little effort has been made to understand or prevent the sicknesses that we have been accustomed to accept as an inevitable accompaniment of advancing years, the journal states.

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