

PHYSICS

New Series of Elements That Change Like Radium

DISCOVERY of a fourth series of chemical elements which change one into another, like the famous radium series, is suggested in a communication just received in the United States from Finland by Dr. Alfred C. Lane, emeritus professor of geology at Tufts College.

The best known series of these radioactive elements is the one that starts with uranium and ends with lead, radium occurring as the sixth step. Another series starts with thorium, and the third involves an element called actinium. Many physicists have suspected the existence of a fourth series, but until now there has not been evidence.

Dr. Walter Wahl, of the University of Helsingfors, has informed Dr. Lane of his new experiments. These were made with the mass-spectrograph, an instrument which sorts out atoms according to their weights. This same instrument was used in obtaining minute quantities of uranium 235, element believed to be capable of producing practical atomic power.

In analyzing, with the mass spectrograph, certain minerals that are geologi-

cally very old, he found evidence of a form of some unknown element of weight 237. This had never been obtained before. As all other elements weighing as much as this are radioactive, Dr. Wahl concluded that this must be also. However, he showed that it cannot belong to any of the three series now known, and he therefore suggests that it is a member of a fourth series.

Evidently he wishes further confirmation of the discovery, for he says that further investigations are being made. He explains that "uncertain conditions, during the European war, which now as earlier at any moment may lead to conditions in which research work is interrupted, makes it necessary to communicate already at this stage the observations made."

By determinations of the amount of lead from the decay of radium in ancient rocks, geologists have been able to measure their age. Possibly, if the new radioactive series does exist, and if lead is one of its products, it may account for slight discrepancies that have been observed in such measurement, Dr. Lane suggests.

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years. Fossil wormholes have previously been reported in petrified wood from Egypt and South Dakota but in both these instances the material had been poorly preserved, so that close study was not possible.

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CHEMISTRY

Post-Graduate Fellowships To Be Awarded in Chemistry

SIX post-graduate fellowships in chemistry, carrying stipends totaling \$13,000, will be awarded soon by the Lalor Foundation, it is announced by Dr. C. Lalor Burdick, secretary of the Foundation. Four of the fellowships carry \$2,000 each; the other two \$2,500 apiece. They are open to both men and women who have completed the work leading to a Ph.D. or its equivalent. Six eminent chemists, at leading American research institutions, will examine applications and make the awards.

Dr. Burdick stated that qualified persons interested in the fellowships may obtain detailed information and application blanks by addressing him at Wilmington, Del. Appointments will be announced early in 1941.

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PALEONTOLOGY

Wormholes From Dinosaur Days Found in Northern China

FOSSIL wormholes, chewed into the petrified wood that was part of living forest growth far back in the days of the dinosaurs, have been found in a petrified forest in the wild parts of northern China by an American missionary-scientist, Rev. G. B. Mathews, with headquarters at the Catholic University of Peking.

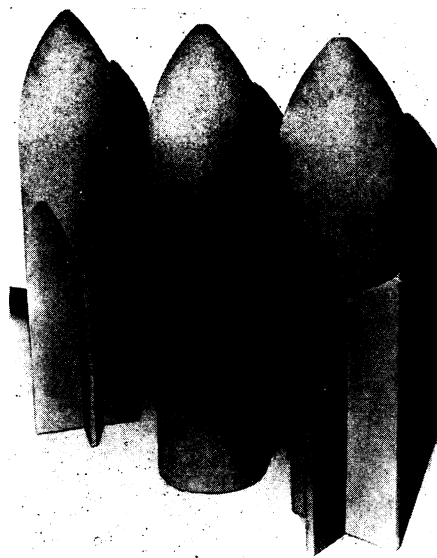
Father Mathews discovered the petrified forest in the course of his mission travels. Once hundreds of square miles in extent, there are today only scattered and isolated fragments. The rest has been eroded away in the course of many tens of centuries.

The petrified tree stumps still stand on their own roots, which itself is a rarity in fossil forests. Breaking off

specimens disclosed the wormholes, as much as three inches beneath the bark. They are from a sixteenth to a quarter of an inch in diameter, and some of them contain pellets of "frass" or food waste, from the meals of the unknown larvae that chewed the wood.

No trace of the hole-borers themselves has been found, but Father Mathews is hopeful that the frass pellets can give some idea of their makers, if examined by entomologists with sufficient experience in the study of wood-boring larvae. There is, of course, the possibility that larvae or pupae of the ancient hole-makers themselves may yet be found.

Geologically, the fossil wormholes belong to the Upper Jurassic period, of an age estimated in excess of 150,000,000



MODERN

These three streamlined aerial projectiles were designed by Leonardo. The center one is practically a duplicate of recent-type artillery shells; the streamlined model on the left is closely similar to bombs dropped from airplanes and fired from high-angle trench mortars. It is known that Leonardo experimented with models of flying machines, also that mortars were favorite weapons in his plans for siege operations.

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