

CHEMISTRY—PHYSICS

Triple Weight Element Made As Atoms Yield Energy

Heavy Hydrogen is Both Target and Projectile in Research Suspected of Producing Mass Three of Same Element

EXISTENCE of triple-weight hydrogen, hitherto suspected but unproved, may be demonstrated by a sensational atom-smashing experiment just made by Lord Rutherford, Drs. M. L. Oliphant and P. Hartleck in Cambridge's famous Cavendish Laboratory and announced in *Nature*.

Double-weight hydrogen, now being studied intensively in the world's chemical laboratories following its discovery in America two years ago, was both target and projectile in the new atomic bombardment. Hearts of heavy hydrogen, called deuterons in America and diplons in England, were flung with hundred-thousand volt energy at salts of ammonia that contained heavy hydrogen instead of ordinary single-weight hydrogen. This impact of deuterons upon deuterons (or diplons upon diplons to follow the nomenclature preferred by the British scientists) gave striking results.

3,000,000 Volts

There was enormous emission of fast protons or hydrogen hearts with energies of three million volts. Particles released had thirty times the energy of those used in the atomic attack.

The Cambridge scientists have two ideas about what happened. Either two heavy hydrogen atomic hearts reacted to give a new hydrogen variety of mass three and an ordinary hydrogen atom, or they formed a helium atom of mass three and a neutron.

Important in Either Event

Even if it turns out that mass three helium instead of a triple weight hydrogen is formed, this will prove to be an important discovery. No atoms of mass three have been unequivocally demonstrated in the past although vigorous searches have been made for them. The weight of ordinary helium is four units on the chemical scale on which ordinary oxygen is sixteen.

This discovery of a mass three atomic heart and the enormous volume of

atomic transmutations achieved is expected to have important influence upon the present feverish exploration for the secrets of matter's composition.

Science News Letter, March 24, 1934

CHEMISTRY—PHYSICS

New Element Will Complicate Chemistry

THE DISCOVERY by Lord Rutherford and his co-workers in England of the probable existence of triple-weight hydrogen tremendously complicates chemistry, and yet it would fit in with the ideas of physicists as to how matter is put together.

Before 1931 only one kind of hydrogen was known. Then in America double-weight hydrogen was conclusively demonstrated. This was followed by the production in several American laboratories of heavy hydrogen and the strange heavy water that it forms. The hearts of heavy hydrogen, called deuterons in America, become useful projectiles in action smashing. Witness the Cavendish Laboratory experiment that seems to mean the existence of either hydrogen of mass three or helium of mass three.

The existence of mass three hydrogen has been suspected and searches have been made. In fact, last September Prof. Wendell M. Latimer and Dr. Herbert A. Young of the University of California

found evidence of its existence in heavy water. They used the magneto-optic method of analysis developed by Prof. Fred Allison of the Alabama Polytechnic Institute, with which Prof. Allison found evidence for the existence of heavy hydrogen of mass two and also discovered the last two unknowns of the 92 chemical elements, alabamine and virginiun.

If the existence of mass three hydrogen is conclusively proved, the number of chemical compounds in the universe is prodigiously increased. Take water, for instance. No longer is it simple H₂O. With three kinds of hydrogen and three kinds of oxygen, there can be eighteen kinds of water. When the thousands of compounds containing hydrogen are considered, the complexity becomes bewildering.

There will be controversy over the name of the new hydrogen. Americans will want to call it "tritium" and its heart or nucleus "triton," corresponding to protium and proton for ordinary hydrogen and deuterium and deuteron for mass two hydrogen. The British will probably favor "triplogen" and "trip-lon."

Science News Letter, March 24, 1934

ENGINEERING

Wandering Bridge Scoops Coal From Pit

A GIANT wandering bridge more than a quarter of a mile long has been put in operation digging brown coal from open pit mines in northern Germany. This ponderous steel structure extends its 1312-foot length from the edge of the pit well out over the vast hole from which coal has been obtained for years. Excavators which are a part of the bridge scoop up the coal and load it into conveyors that lead to waiting railway cars.

Eighty-one electric mo- (Turn page)



COAL MINER

This unique structure is a coal mining bridge or excavator which is capable of filling 1000 railroad cars a day with brown coal from open pits of northern Germany.