

CHEMISTRY-PHYSICS

# Nobel Researches Set Off Bursts of New Knowledge

## Chadwick Discovered a New Building Block of Matter While the Joliot's Made New Radioactive Elements

THE Nobel prize awards to Prof. F. Joliot and Mme. Irene Curie-Joliot, in chemistry, and to Dr. James Chadwick in physics recognize two of the most important achievements in physical science in recent years:

Discovery of the neutron, now considered one of the three ultimate particles of all matter in the universe—the achievement of Dr. James Chadwick, now of Liverpool University and at the time of his discovery in 1932 at Cavendish Laboratory in Cambridge, England.

Discovery of artificial radioactivity and manufacture of new radioactive elements—the achievement of the Joliot's, Parisian husband-and-wife research team, early in 1934.

The award to Irene Curie, as she signs her research papers, marked the first case of child of a Nobel prize winner receiving the Nobel prize. For Mme. Joliot is the daughter of the late Pierre and Marie Curie, Nobelists jointly with Henri Becquerel in 1903 for their work on radioactivity. The mother of Irene Curie also received the Nobel prize in chemistry in 1911, thus becoming twice a Nobelist, still a unique achievement.

### Modern Alchemy

The discovery of the neutron by Dr. Chadwick grew out of the modern alchemy of physics whereby transmutation is accomplished—not the sordid turning of lead into gold desired by the ancients, but more important to science, the turning of many light atoms into other elements in small but significant amounts. Lord Rutherford, Nobelist himself and head of Cavendish Laboratory, knocked "H" (chemical symbol for hydrogen) out of nitrogen in 1919. There was one light-weight element, beryllium, that resisted similar transmutation, and it was an attack on this metal that produced neutrons.

When bombarded with a stream of helium atomic hearts let loose by that radioactive cousin of radium called polonium, there was produced from beryllium a stream of powerful radi-

ation. The Joliot's in Paris and two Germans, Bothe and Becker, thought that it was the well-known gamma radiation so useful in cancer treatment, but Dr. Chadwick recognized it as a stream of electrically neutral particles which had already been suspected from theory and had even been named "neutrons" before discovery.

Because of its electrical neutrality, the neutron has the ability to plunge itself into places that can not be reached by other atomic particles. It was immediately seized upon as a very welcome tool for prying open the atom. Used by investigators in America and elsewhere, it opened up a new bonanza of atomic knowledge.

### World-Acclaimed

Two years later the achievement of artificial radioactivity by the Joliot's was world-acclaimed. The persistence and unchanging nature of natural radioactivity has perplexed scientists. Try as they will, they cannot speed, slow or otherwise change by an iota the constant natural disintegration of radium or any other radioactive substance.

Man-caused radioactivity was first produced in aluminum, familiar metal. A stream of helium atom hearts was flung at a thin foil of this metal. Out came first neutrons, and then a stream

of positrons, another atomic particle discovered in 1932 by Dr. Carl D. Anderson, California Institute of Technology. What was unusual and important is that the positrons were flung off for many minutes after the bombardment stopped. The atom was disintegrated not like an explosive shell but like an incendiary bomb.

Here was radioactivity made to order. There was great activity in laboratories as atomic particles of various kinds were flung by high-voltage current at various substances. A large number of substances were transmuted into new radioelements that lived for minutes, hours or a few days and then blew themselves up with release of powerful radiations.

There was hope aroused that these new radio-elements would be of medical and industrial importance. Today it is known that plans are under way in one laboratory at the University of California to produce radiosodium in quantity in the hope that eventually it can be used in the treatment of disease through its injection into the blood streams of the patients.

The chemistry prize awarded the Joliot's is for this year and the physics prize to Dr. Chadwick is the 1935 prize. The 1934 physics prize, not awarded last year, will not be awarded at all but will be added to the Nobel fund for future prizes.

*Science News Letter, November 23, 1935*

BACTERIOLOGY

## No "Germs" at Altitudes Of 20,000 Feet and Over

THE AIR at altitudes of 20,000 feet and up to 28,000 feet is apparently free from "germs" or what bacteriologists call sterile, Dr. George Walker of Baltimore reports. (*Science*, Nov. 8.)

Although his right index finger was



AWARDED NOBEL PRIZE

The Joliot's, husband and wife, and (right) Dr. James Chadwick.