PHYSICS

Birth Of Atom Splitting

First evidence that atoms can break apart was discovery of natural radioactivity and spontaneous change of radium into uranium and thence into lead.

➤ EVEN NINETEENTH-CENTURY physics and chemistry, which regarded atoms as solid, unsplittable little lumps of unchangeable matter, provided hints that eventually gave the world an entirely different picture of the atom and led the way to its explosion into energy, with most dramatic demonstration in the atomic bomb, Dr. Lise Meitner, visiting professor of physics at the Catholic University of America, told 40 finalists in the Fifth Annual Science Talent Search.

German-born Dr. Meitner, whose permanent post now is with the Royal Swedish Academy of Sciences in Stockholm, pointed out that as soon as the Russian chemist Mendeleef had arranged the elements according to their atomic weights in his classic periodic table, the rhythmic recurrences of numerical relations between and within the various groups suggested that atoms were not simple, indivisible particles but that they had a composite structure, being made up of still smaller particles that we have since come to know as electrons, protons and neutrons. The many bright lines in the spectra given off by elements when heated provided another hint of the probable complexity of atomic structure.

First solid evidence that atoms can break apart, and that in so doing they become atoms of another element, was provided by the discovery of natural radioactivity, and the spontaneous change of radium into uranium and thence into lead, at about the turn of the century. At the same time, the theoretical work of such scientists as Bohr and Einstein strengthened the indication that all atoms are made of separate particles, and that if attacked in the right way they can be broken in pieces.

This stimulated the rising generation of physicists in their efforts to achieve in the laboratory the effects that had been shown as theoretically possible. First attempts resulted simply in the peeling off of some of the outside electrons from atoms. Later, the tight little nucleus itself, at the heart of the atom, was torn apart. Dr. Meitner's own work was of key importance in this, since she was the first to offer an explanation of the relatively huge release of energy resulting from the disruption of the atomic nucleus.

From this explanation, other physicists proceeded to work toward material and practical application. First result, under the spur of wartime necessity, was the terrible atomic bomb. The future may see a more gradual and ordered release of atomic energy in fuelless power plants.

Science News Letter, March 16, 1946

MEDICINE

Young Scientists Asked To Develop Antibiotics

➤ THE NATION'S most scientifically talented high school boys and girls were given the mission of finding new remedies like penicillin and the sulfa drugs for conquering infantile paralysis, influenza, the common cold and other still-unconquered virus-caused diseases.

The boys and girls are the 40 winners of the Fifth Annual Science Talent Search. Their life-saving mission was given them by Dr. Selman A. Waksman, of Rutgers University and the New Jersey State Agricultural Experiment Station, who, with his colleagues at these institutions, discovered streptomycin, new and powerful ally of penicillin in disease fighting.

Speaking at the Fifth Annual Science Talent Institute, Dr. Waksman said:

"Although many infections, notably those caused by viruses, still remain uncontrollable, the hope exists that sooner or later these will come under control.

"It is to you, the scientists of the future, that we are all looking to enlarge your knowledge, to discover new scientific principles, and to apply those already known to improving the health and the very life of man."

Science News Letter, March 16, 1946

Succulent plants, particularly lilacs, and certain cut flowers can be kept fresh and in a crisp condition for many extra hours by a vacuum treatment in which air in the plant tissues is replaced by water.

The *marabu,* a troublesome 12-foot shrub of Cuba, that overruns thousands of acres of agricultural land, has two points in its favor: it makes excellent charcoal and is a soil-builder because it is a legume with soil bacteria on its roots.

FURTHER EXPLANATION—Dr. Meitner, surrounded by a group of eager boys and girls, winners in the Fifth Annual Science Talent Search, discusses the structure of matter after her talk before a session of the Science Talent Institute. (Left to right: Hummel, Meitner, Karasz, Gibson, Arnold, Gaines.)