PHYSICS-CHEMISTRY

Nobel Prize Winners

Nobel Prizes for Physics and Chemistry were awarded three scientists, one Russian and two British, for their studies on helium and the body proteins.

➤ THE RUSSIAN development of the atomic and hydrogen bombs is believed by experts in the United States to be due in large measure to the brilliance of the Russian scientist who is this year's Nobelist in physics, Dr. Lev Davidovic Landau.

Considered in this country to be the leading Russian theoretical physicist, Dr. Landau's researches cited in the prize award were actually published as early as 1941, and had to do with what is called the "second sound" of helium, one of the strangest anomalies exhibited by matter.

Their second sound designates a special thermal wave property of liquid helium in a state labeled II, which is a weird form taken by extremely cold helium at 2.19 degrees above zero absolute. There results seemingly paradoxical behavior that heat flows uphill and there is practically no friction and an absence of viscosity. Second sound has nothing to do with sound waves such as in microphones but instead is most useful in understanding the kind of physics known as quantum hydrodynamics. Helium is the light chemical element four times the weight of hydrogen and normally a gas.

Dr. Landau has seldom traveled outside the USSR although he is known to have had many invitations. He speaks excellent English, learned largely from U.S. movies. He is 54. In January this year he suffered critical head injuries in an automobile accident and has been hospitalized for a long period. Foreign medical experts and special medicines from abroad aided in saving his life.

When the physics principle of parity was invalidated by American researches later recognized by the Nobel Prize, Dr. Landau suggested a new hypothesis that provided that a new principle of parity could hold if the concept were widened to include the antiparticles as well as normal particles of nuclear physics.

• Science News Letter, 82:301 November 10, 1962

Two Win Chemistry Prize

➤ MAPPING the structure of two body proteins brought two scientists a Nobel Prize and gave scientists the exciting promise of a solution to the age-old mystery of life itself and the control of many diseases.

Dr. Max Perutz and Dr. John C. Kendrew of Great Britain jointly received this year's Nobel award in chemistry for their work on the structure of hemoglobin (oxygen-carrying protein in the blood) and myoglobin (oxygen-carrying protein in the muscle). Their findings, which revealed the three-dimensional structure of protein, is a correlation of many years of difficult and delicate basic research begun in 1939 by Dr. Perutz at Cambridge University. Dr. Perutz heads the medical research council for molecular biology at Cavendish Laboratory, Cambridge University. Dr. Kendrew, a former student of Dr. Perutz, is deputy director.

Hailed as "an exciting breakthrough" by leading biochemists in U.S. and abroad, the work of the two British Nobelists now makes it possible for scientists to investigate the structure of proteins and discover how the molecules get into the particular shape they do. Most of these molecules are enzymes, organic catalysts whose action is related to all the physical processes in living things—healthy growth as well as disease.

While hemoglobin and myoglobin are not enzymes, the intensive research on these molecules now makes it possible to define the nature of the active sites of enzymes and by so doing obtain an understanding of the detailed molecular mechanism of the action of enzymes.

To Dr. Giulio Cantoni, chief of the laboratory of cellular pharmacology of the National Institute of Mental Health, Bethesda, Md., "The beauty of their great discovery is that it reveals the structures of proteins which are the most important constituents of living cells. As we conquer the mysteries of life itself through such discoveries, we may learn to control it."

Future studies on healthy and diseased cells may lead to the discovery of fundamental causes of diseases. The works of Drs. Perutz and Kendrew even may make it possible to design drugs to bring about alteration in the disease process.

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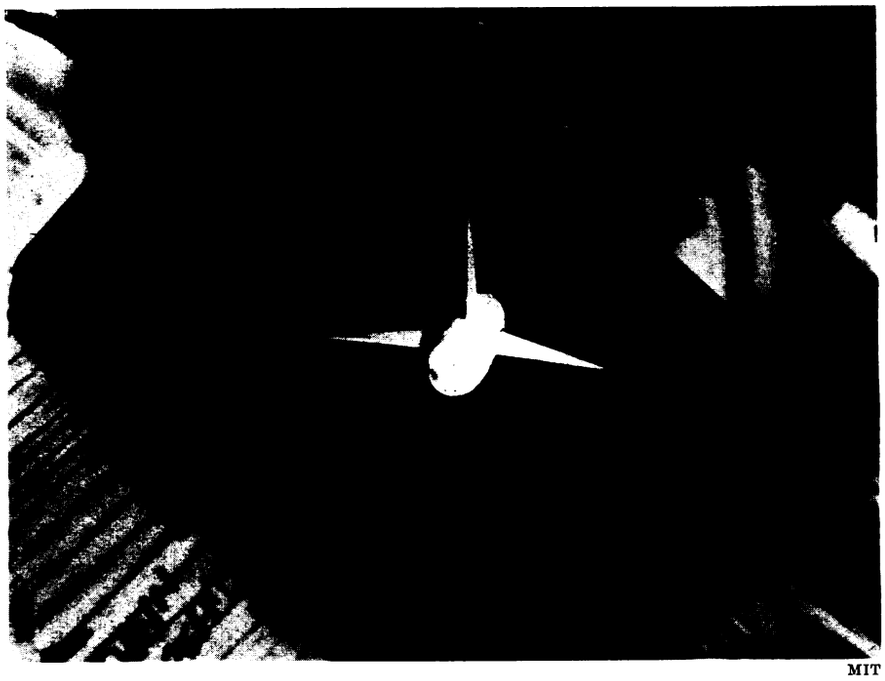

MIT

MAGNETIC SUSPENSION—An airplane model is held in mid-air by magnetic suspension with no visible means of support. The technique, developed at the Massachusetts Institute of Technology's Aerophysics Laboratory is used to make wind tunnel tests on models under conditions of supersonic speed and high altitude pressures without interference from support structures.

DENTISTRY

Tooth Decay Seen Slowed By Electrical Therapy

➤ ELECTRIC CURRENT is being used experimentally to speed the formation of "secondary dentin" to slow the advance of further decay, the American Dental Association meeting in Miami Beach was told.

Dentin is the hard tissue that forms the chief substance of a tooth, underlying the enamel and the outer bony layer of the root called the cementum. When a tooth becomes decayed or otherwise injured, layers of secondary dentin form within the tooth to thicken the wall between the pulp (nerve) and the decay.

Dr. William Lefkowitz of the University of Kansas City, School of Denistry, Kansas City, Mo., reported an experiment showing that 17 of 19 teeth treated with electric current showed a thicker layer of secondary dentin than is ordinarily produced during the tooth's self-repairing process. The removal of decay and the filling of teeth will still be necessary, Dr. Lefkowitz said.

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