

The Month at Caltech

Immunochemistry

The National Institutes of Health has allocated approximately \$100,000 a year to Caltech for a broad seven-year program of research in immunochemistry, including studies of the basic mechanisms involved in allergic reactions.

While some new projects are planned, most of the funds will be used to support work already in progress under the direction of Dan H. Campbell, professor of immunochemistry, and Justine S. Garvey, senior research fellow, and a group of about 20 scientists and technicians.

The group is doing research in many of the basic problems in immunology. Research will continue in attempts to isolate pure antibodies so that their chemical structure and physical properties can be analyzed. Antibodies are proteins manufactured by the body to inactivate invading viruses and other foreign proteins.

Work will also continue in growing cells artificially in tissue culture and in developing techniques for harvesting antibodies from such cells.

Dr. Garvey will pursue her research with the tissue culture of liver because the artificial production of these cells offers the possibility of growing the hepatitis virus for the development of a vaccine against this disease.

Tissue culture is beginning to offer possibilities as a powerful tool in studying the synthesis of antibodies and the role of antigens in such synthesis. Antigens, which are the viruses and other foreign proteins that invade the body, have been detected in animals two years after infection, long after the symptoms they caused have subsided.

One of the grants is for research being done exclusively by Dr. Campbell. It will support continuation of his attempts to isolate the precise part or parts of ragweed pollen that cause allergic reactions. Similar work is under way on timothy hay. Another facet of Dr. Campbell's research is a study of soluble antigen-antibody complexes that are very toxic.

Several projected new studies involve the detection and behavior of antibodies, including work on their specificity, and an investigation into the role of the liver in gamma globulin formation.

An important part of the immunochemistry program at Caltech has been, and will continue to be, the research support of young physicians and PhD's who want advanced research experience. Caltech is one of the few institutions in the world where advanced training in immunology is possible.

James Edgar Bell

Dr. James Edgar Bell, professor emeritus of chemistry, died on October 15 in a Pasadena rest home. He was 87 years old. Dr. Bell was in charge of freshman chemistry classes at Caltech for 29 years, until his retirement in 1945.

Dr. Bell was born in Gettysburg, Ohio. He received his BS from the University of Chicago, and his PhD from the University of Illinois. He taught at the University of Washington before coming to Caltech in 1916, when the school was known as the Throop College of Technology.

After retiring from Caltech, Dr. Bell taught chemistry at Rollins College in Winter Park, Florida, until 1952.

Moessbauer Effect

More than 100 invited scientists and industrial representatives came to the campus on November 2 to discuss how the Moessbauer effect makes it possible to learn more about the interacting forces within atoms.

The effect is named for Dr. Rudolf Moessbauer, Caltech professor of physics, who was awarded the 1961 Nobel Prize in physics for discovering it.

The Moessbauer effect is a yardstick which makes it possible to measure the effects of natural forces such as gravity, electricity, and magnetism on photons and atomic nuclei with an unprecedented sensitivity. It has opened a great many new research possibilities in nuclear and solid state physics and relativity.

The one-day colloquium was sponsored by the Caltech Industrial Associates, consisting of about 40 companies associated with the Institute in support of teaching and research.

National Science Board

The National Science Board, composed of 24 of the country's leaders in research, education, and public affairs, held its 81st meeting at Caltech, November 15-17.

The Board is the governing body of the National Science Foundation, which was established by the Federal Government in 1950 for the purpose of developing national science policy. Empowered to give financial support to individuals and institutions engaged in basic scientific research, the Foundation's



Recent photographs of the Comet Humason, taken with the 48-inch Schmidt telescope on Palomar Mountain, reveal that it may have been involved in a collision with a large cloud of radiation from the sun. The swirling tail of the comet, 9,000,000 miles long, gives the clue to the collision. When this picture was taken the comet was well beyond the orbit of Mars,

approximately 240,000,000 miles away from the sun. Normally, comets do not show the disintegrating effects of solar radiation until they approach much closer to the sun. The comet is named for Dr. Milton L. Humason, who discovered it in September 1961, shortly before his retirement from the staff of the Mount Wilson and Palomar Observatories.

budget for the fiscal year 1962-63 amounts to \$360 million.

The Board normally holds nine meetings a year—eight in Washington, D.C., and one elsewhere. The meeting at Caltech is its first on the West Coast.

Mariner II

The Venus-bound Mariner II spacecraft established a new deep space measurement communications record on November 15 as it transmitted engineering and scientific data to earth from nearly 18 million miles in space, during the 81st day of flight.

The earlier communications record was set by the Pioneer V space probe at a distance of 17.7 million miles. At that distance, on June 14, 1960, Pioneer V's signal strength dropped below the minimum for transmission of data.

Mariner II has been transmitting engineering and scientific data continuously 24 hours a day, except for a period from October 31 to November 7, when

the scientific instruments were turned off to reduce the power demand following an unexplained decrease in voltage supplied by the solar panels. The power level returned to normal on November 7 and the experiments were again turned on.

Engineering data — pressures, temperatures, voltages — report on the status of the spacecraft's various systems. Scientific data is collected by four interplanetary experiments carried aboard the spacecraft.

The mission of Mariner II is to fly by Venus, at a distance of 20,900 miles, and measure microwave and infrared emissions from the planet. The two planetary experiments will be automatically activated ten hours in advance of the fly-by. During the fly-by, all six scientific experiments will be functioning to supply data on the planet. They will answer such basic questions as whether Venus has a magnetic field, whether it has a belt of charged particles around it like the earth's Van Allen belt, and the presence or absence of cosmic dust.

The fly-by will occur on December 14, during the 110th day since the Mariner launch on August 27.