

## ASTROPHYSICS

# Expanding Universe Shown

► NEW EVIDENCE of the expansion of the universe is given by radio microwaves measured here on earth after arrival from the tremendous collision of two vast stellar systems like our own Milky Way.

With the 50-foot radio telescope atop the Naval Research Laboratory, Anacostia, D.C., two scientists, Dr. A. Edward Lilley and Edward F. McClain, tuned in on the radio noise of the sky's second "brightest" source of radio waves, called Cygnus A.

They found that the frequency of these 21-centimeter waves is shifted toward the red end of the spectrum by what is considered the recession or rushing away of the gigantic galaxies. This corresponds to the red shift or Doppler effect discovered in light from the same galaxies.

Both light and radio are caused by the energy of collision of the hydrogen gas

molecules in the clashing stellar systems.

The galaxies are rushing away with the expansion of the universe, which is greater the farther away from us. At the Cygnus A distance of a hundred million light years (light traveling in a year at 186,000 miles per second) the velocity of recession is approximately 10,500 miles per second for both radio and light waves. This is presumably an actual flying apart of the universe. The optical velocity was determined at Palomar Observatory after the location of the radio "star" had been obtained by British and Australian radio astronomers.

The correspondence of both the light and radio effects make scientists more confident they are dealing with expansion effects and not some change in fundamental laws with distance.

Science News Letter, January 14, 1956

## GENERAL SCIENCE

# Science Understanding

► COUNTERATTACKING antagonism that has arisen toward science and engineering and the claims of humanists that they are narrowly materialistic and destructive of human values, President James R. Killian, Jr. of the Massachusetts Institute of Technology, in the Sigma Xi address before the American Association for the Advancement of Science meeting in Atlanta, called upon non-scientists to understand the meaning, the method and the spirit of science.

Poets, historians and men of affairs are proud that they do not learn anything about science, Dr. Killian charged. As a result the world has a philosophy that is

quite anachronistic and inadequate to our times, he observed.

In a faculty meeting of a liberal arts college, Dr. Killian reported, everybody laughed when a student named Cicero was reported as having flunked Latin, but when a student named Gauss was named as having failed mathematics, only the science professors laughed.

Dr. Killian said that there is too much protesting that only in the liberal arts can the true gospel of man be found and that there is a tendency to make the scientist the scapegoat for the ills of the modern world.

Science News Letter, January 14, 1956

## PHYSICS

# Probe Atomic Hearts

► MANY new inhabitants of atomic hearts will be discovered before scientists reach an understanding of the mysterious forces that keep nuclei from flying apart.

Physicists have just begun to recognize some familiar faces in the crowd of tiny particles packed in the nuclear core, but about as fast as older ones are recognized, new ones are discovered.

This game of hide and seek will probably continue for some time, scientists attending the American Physical Society meeting at the University of Southern California, Los Angeles, agreed.

In their search for new particles, giant atom smashers and the faint tracks that cosmic rays leave on photographic emulsions are the two most powerful tools. This field, known as high-energy nuclear physics,

is the very forefront of physics today.

A "mopping-up" operation, where all needed information is available yet scientists still do not understand what is going on, is also being conducted at many laboratories throughout the country investigating the phenomenon of superconductivity, first discovered by K. Onnes in 1911.

Such familiar metals as lead and tin, when cooled to temperatures within a few degrees of absolute zero, 459.7 degrees below zero Fahrenheit, exhibit strange and mysterious properties.

An electric current once started in a lead circular wire at these low temperatures will continue to flow indefinitely without loss of amount, as far as can be told.

At room temperatures, current in the same wire would "ooze away" within a

fraction of a second, Dr. R. P. Feynman of California Institute of Technology reported.

Man's brains are the most important tool in tackling superconductivity, he said. He likened the subject to a besieged city far behind the front lines.

The laws governing the behavior of materials are well understood until the jump to superconductivity is taken at a very low, but definite temperature.

Then suddenly, scientists are faced with mysterious reactions, not involving new particles, but only the "familiar" electrons. Yet, after 40 years of research, superconductivity still remains to be explained.

Science News Letter, January 14, 1956

## GENERAL SCIENCE

## AMA to Participate in National Science Fair

► THE AMERICAN Medical Association will present a special citation and an invitation to exhibit at its annual meeting to the boy or girl exhibiting the best display on medical research, general health, or physical fitness, at the Seventh National Science Fair, next May 10-12, in Oklahoma City.

This action, announced by Dr. Alphonse McMahon, St. Louis, chairman of the AMA's Council on Scientific Assembly, will mark the first time the AMA has actively participated in the National Science Fair, sponsored by Science Clubs of America, a Science Service activity.

In making the announcement, Dr. McMahon said:

"The advancement of medical science depends on our developing and encouraging medical talent among high school students. We appreciate this opportunity to stimulate young scientists and to let them know that medicine is worthy of their talents.

"Our invitation to the winning student to be an AMA guest at our annual meeting in Chicago next June 11-15 will permit his work to be included among over 300 other medical exhibits, prepared and staffed by some of the world's most eminent physicians. His display will be part of the official Scientific Exhibit in Navy Pier where more than 20,000 physicians will gather during the five-day meeting."

The AMA will assume the expenses of the winner's Chicago visit, and is presently encouraging its constituent state and county medical societies to undertake sponsorship of local and regional high school science club fairs from which finalists may be sent to the National Science Fair in Oklahoma City.

The AMA award, a feature of its career guidance program, is in addition to about 50 other National Science Fair Awards, which total about \$2,000 in scientific apparatus and material.

Approximately a hundred local and area science fairs are expected to send about 190 young scientists to the Seventh National Science Fair in Oklahoma City.

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