NECROLOGY

Chemistry Editor Dies

➤ MRS. HELEN MILES DAVIS, 61, chemist and editor of the magazine CHEMISTRY, died of cancer Jan. 25, at Suburban Hospital, Bethesda, Md.

HELEN MILES DAVIS

She was the wife of Watson Davis, director of SCIENCE SERVICE and editor of the SCIENCE NEWS LETTER. Other survivors are a daughter, Mrs. Calvin N. (Charlotte Davis) Mooers, and a son, Miles Davis, both of Cambridge, Mass.

Born in Washington, D. C., April 13, 1895, she was the daughter of the late Henry R. Miles and Charlotte Ketcham Miles. She had resided at 1422 Rhode Island Avenue, N. W., Washington, D. C., for 35 years. She spent her childhood in Harpers Ferry, W. Va.

Graduated from George Washington University College of Engineering with a B.S. in Chemistry degree in 1918, she specialized in the popularization of science, especially chemistry, and the history of science. Since 1944 she had edited CHEMISTRY magazine which is used especially in high schools. The following books were writtten or edited by her: THE CHEMICAL ELEMENTS, SCIENTIFIC INSTRUMENTS YOU CAN MAKE, ATOMIC FACTS, SCIENCE EXHIBITS, CHEMISTRY SHOW BOOK, EXHIBIT TECHNIQUES. Her compilation of "New Laws of Matter" has run through five editions since its compilation just after announcement of the atomic bomb.

As chemistry writer for SCIENCE SERVICE, she reported the Geneva (1955) conference on the peaceful uses of atomic energy, an atomic bomb test, and numerous meetings of the American Chemical Society and other scientific societies.

She was a member of the American Chemical Society, Chemical Society of Washington, the Congressional Press Gallery, Sigma Kappa sorority and the Eistophos Club.

Science News Letter, February 9, 1957

METEOROLOGY

Daily Jet Stream Data

➤ DAILY PREDICTIONS of the position of the "jet stream," the fast-moving current of air high in the atmosphere that often is used by pilots to speed up west-to-east flights, may become part of routine weather service. It has recently been the key to new records set on coast-to-coast flights.

The core of this high, fast wind tunnel has been located and plotted on maps for the entire United States, the American Meteorological Society meeting in New York was told. Lt. Comdr. J. W. Hinkelman, U.S.N., reported the research he conducted with Dr. Herbert Riehl of the University of Chicago, based on information supplied by the U. S. Weather Bureau.

They found the jet stream core is about 4,000 to 15,000 feet thick. There the winds vary no more than 10% of the average core speed, which can range from 80 to 230 miles per hour. The jet stream system itself moves across the U. S as slowly as 20 miles an hour, and rises or descends about 3,000 feet in a day from its average position of about 30,000 feet.

Knowledge of jet streams is becoming increasingly important as more jet aircraft come into commercial and military use. Pilots can use them for an added "lift" when headed eastward, try to avoid bucking them at any time. Often it is more practical to take the longer, but faster, twisting trail of the jet stream than a shorter straight course with slower tail winds.

The jet streams plotted by Dr. Riehl and Cmdr. Hinkelman were those of the winters of 1954 and 1956. They found that frequently the stream entered the U. S. over the Pacific Northwest, snaked across the country and headed out over the Atlantic over the New England states.

Predicting progress of the winding stream is comparatively simple because it maintains its original configuration from day to day, shifting about 20 miles an hour. The research was part of the U. S. Navy's Project AROWA.

Weather predictions using mathematical formulas are up to 90% accurate for the eastern U. S., but "worse than no forecasts at all" for the area between the Continental Divide and the Mississippi Valley, Dr. Sverre Petterssen, director of the University of Chicago's weather forecasting research center, told the meeting.

Dr. Petterssen analyzed results of two approaches to numerical weather predictions. Both methods forecast weather by means of complicated mathematical formulas. The forecasts for upper levels of the atmosphere and therefore for aviation purposes proved quite accurate.

The two mathematical techniques are the physical model, in which the laws of physics are applied to the thermodynamics of the atmosphere, and the statistical model, in which data of the past and the present are applied to the future.

The simple physical model, which uses data from only one level, at present is best for forecasting wind systems in the middle part of the atmosphere.

Science News Letter, February 9, 1957

PHYSICS

Theory of Electron Flow in Metals

➤ A THEORY that explains for the first time how the swarms of electrons in copper wire behave was reported by Dr. Keith A. Brueckner of the University of Pennsylvania.

The theory also explains three other problems that have been a puzzle to physicists for many years, Dr. Brueckner said at a symposium on the Many-Body Problem held at the Stevens Institute of Technology. Mathematics for the theory is so complicated that only the very high-speed computing machines, or "brains," can handle the equations.

Dr. Brueckner said he and his collaborators used the IBM-704 at Los Alamos Scientific Laboratory, Los Alamos, N. Mex., to help solve the problems. Those working with him included Dr. J. L. Gammel of Los Alamos, Dr. Murray Gell-Mann of California Institute of Technology and Kuro Sawada, a Japanese physics student at Los Alamos.

The electrons carrying the electricity, as in ordinary household wiring, behave like a gas. Drs. Brueckner and Gell-Mann have been able to determine mathematically the exact energy of such a system at very high density.

The other problems solved by similar methods include the behavior of very large nuclei, or atomic cores, such as uranium or gold, and an explanation of the properties of both helium-three and helium-four at temperatures near absolute zero, which is 459.7 degrees below zero Fahrenheit.

The symposium was the first ever held on the many-body problem, one of the oldest problems in physics. It concerns predicting from theory the behavior of a large aggregate, such as particles in a nucleus or very cold helium atoms, when the behavior of some of its parts is known. The difficulty is projecting the known information on a vast scale, involving, for instance, the interrelationships of the billions of atoms in a grain of sand.

Dr. Brueckner reported his studies are continuing in the hope of obtaining even more exact solutions to the equations.

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