

PHYSICS

## Giant Quantum Effect Detected by Scientists

➤ A MACROSCOPIC QUANTUM system, formed by the wavelike properties of electrons flowing between two superconductors, has been reported.

This observation made by scientists at the Ford Motor Company gives firm experimental support for an important theoretical picture of superconductivity. Superconductivity is the apparently complete disappearance of resistance to electrical current in certain metals at temperatures near absolute zero.

The giant system obeys the laws of quantum theory, developed to account for sub-microscopic phenomena, but it extends over a distance of three and a half millimeters, a small but visible fraction of an inch.

Giant quantum effects are very rare and this is the first time one of such great size has been detected.

In other experiments far smaller giant effects have been observed which extended over an area of about ten microns, thousands of times smaller than the system studied by the Ford scientists.

On the scale of the atomic world the interference between these wave properties occurring over three and a half millimeters is vast. Most electron motions must be measured in units that are tens of millions of times smaller than a millimeter.

Drs. James E. Mercereau, John J. Lambe, Robert C. Jaklevic and Arnold H. Silver of the Ford Scientific Laboratory, Dearborn, Mich., reported their work in *Physical Review Letters*, 12:7, 1964.

Dr. Mercereau said, in commenting on the work, that it "puts on a firm experimental basis the theoretical picture of superconductivity as a single quantum state of very large extent that was first postulated by Professor Fritz London, more than twenty years ago."

The late Dr. London was professor of theoretical chemistry at Duke University and a leader in the study of superconductivity.

• Science News Letter, 85:159 March 7, 1964

## Do You Know?

The island of *Hawaii* is the largest mountain mass on earth, the peak of Mauna Kea rising from the ocean floor nearly a mile more above sea level than Mt. Everest.

Insect sex *attractants* probably are the most potent physiologically active compounds known.

*Hogs* have a circulatory system similar to man and also suffer from hardening of the arteries and blood clots.

One million acres of agricultural *land* are being converted to urban use each year.

A one-third reduction in childhood *mortality*, due largely to decreases in deaths from infectious diseases and accidents, was achieved in the past 12 years.

• Science News Letter, 85:159 March 7, 1964

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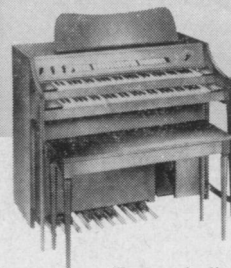
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