

PHYSICS

"Second Sound" Not Heard

New sound is in range of human hearing, but apparently exists only in liquid helium at temperatures near absolute zero.

➤ A NEW KIND of sound has been discovered, but you won't be able to hear it. Called "second sound," the new sound is essentially a temperature wave which occurs only in liquid helium at a temperature only slightly above absolute zero.

"Second sound" was revealed by Drs. Cecil T. Lane, Lars Onsager and Henry A. Fairbank after extensive experiments with liquid helium in the Sloane Physics Laboratory of Yale University.

Although well within the range of normal hearing with a tonal frequency corresponding to about middle C, the new sound cannot be heard by the human ear. Apparently it occurs only in liquid helium and ceases when the helium's temperature rises above 2.2 degrees Centigrade over absolute zero, which is approximately 273 degrees Centigrade below zero. Waves of "second sound" travel at a speed of only about 70 feet per second compared with 700 feet per second for normal sound waves.

Temperatures within one-hundredth of one degree of absolute zero were reached in the laboratory experiments with liquid helium. Iron and steel at that temperature would shatter like glass, as would a human finger dipped into the very low temperature material.

While the research in the neighborhood of absolute zero has been limited to scientific discovery, Dr. Lane said practical applications from studies of sub-normal temperatures might produce such revolutionary developments as a new alloy which would reduce electrical resistance and expand power transmission.

He reported that other researchers have already developed delicate heat-measuring devices from low temperature research which may lead to more precise knowledge of the universe.

Describing heat in substances as "a sort of mask," Dr. Lane explained that heat causes vibrations which almost disappear at absolute zero.

"Experience with liquid helium and a temperature of absolute zero hold the

possibility of greater application of the fundamental theories behind all modern physical research," he declared.

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CHEMISTRY

Americium Is Purified For Study of Properties

➤ A THIRD of the synthetic, transuranic elements, americium, has been purified in sufficient quantities to permit a study of its chemical properties.

This was revealed for the first time by Dr. Glenn T. Seaborg, University of California nuclear chemist who was a leader in atomic bomb research.

Dr. Seaborg said that the work on americium, element 95, which was done by Dr. B. B. Cunningham at the University of Chicago Metallurgical Laboratory, was "a remarkable achievement in that the amounts available were even smaller than those in the case of neptunium and plutonium, the previously purified synthetic elements."

The scientist also revealed that curium 242, the heaviest isotope of any element so far reported, can be produced by the same chain-reacting pile technique used for obtaining plutonium. Instead of bombarding uranium with neutrons, it would be necessary to bombard americium with neutrons.

Curium is the only one of the synthetic elements not yet isolated in pure form, Dr. Seaborg pointed out. He indicated, however, that this may be possible if and when such isotopes as curium 243, 244, 245, or 246 are produced. Such isotopes, Dr. Seaborg said, may have longer lifetimes than the brief span of the curium isotopes now known.

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MEDICINE

Veterans Can Spread San Joaquin Valley Fever

➤ DISCOVERY of an unsuspected health threat from returning veterans is announced by Maj. Sol Roy Rosenthal, Army Medical Corps, and Lieut. John



AMERICIUM HYDROXIDE—The gray matter in the bottom of the capillary "test tube" is pure americium hydroxide, isolated by Dr. B. B. Cunningham. The eye of an ordinary needle is shown for comparison of size.

B. Routien, Army Sanitary Corps, at Bruns General Hospital in Santa Fe.

Valley fever, or San Joaquin Valley fever as it is also called, may, contrary to previous universal scientific opinion, be spread from man to animal and from animal to animal, the Army scientists report in *Science* (Nov. 22). It probably can also be spread from man to man.

Patients with this disease must therefore be considered infectious and isolated to prevent its spread until they have been proved non-infectious.

Many soldiers who trained in Texas, Arizona, New Mexico and the San Joaquin Valley, Calif., have returned home carrying the fungus that causes the disease in their bodies. Spread of the disease from them to others in many parts of the United States is possible, in view of these latest findings.

The fungus cause of the disease gets into the body by being breathed in. It may cause either a harmless, self-limiting lung disease or a progressive, chronic and malignant disease which may spread from the lung to any or all organs of the body. Medical name for the disease is coccidioidomycosis. The fungus cause is named *Coccidioides immitis*.

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