

# STANFORD MEDICAL CENTER NEWS BUREAU

## Palo Alto, California

FOR FURTHER INFORMATION CONTACT: Joan R. McGee (DA 1-5310)

A 61-year-old bachelor who is deaf reported that he "heard" sounds in experiments in which two researchers from the Stanford University School of Medicine electrically stimulated his hearing nerve.

Anthony Vierra of San Jose, Calif. was a patient at the Veterans Administration Hospital in Palo Alto before he volunteered for the experiments last year.

In May 1964 Dr. F. Blair Simmons, assistant professor of surgery, and Dr. John M. Epley, a resident in otolaryngology, implanted six tiny wires into the man's auditory nerve. The auditory nerve is located in the inner ear, one of the three sections of the ear.

Normally, sounds come into the inner ear and, in a way not completely understood, trigger the nerve fibers of the auditory nerve. These fibers produce the electrochemical pulses that travel along the auditory nerve to the brain which interprets them as sounds.

In this experiment the two researchers stimulated the auditory nerve fibers directly by applying very small pulses of electrical current to an electrode or pairs of electrodes.

The electrodes led to a connector behind the right ear, where external contact could be made.

By stimulating the nerve fibers, the researchers produced a variety of sensations, covering a range of pitches between very low sounds like hums to very high sounds like violins.

"Although the range and variety was insufficient to reproduce speech for Vierra, he could tell speech from other sounds," Dr. Simmons said, "probably because of the difference and changes in rhythm or amplitude."

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The researchers said that it was possible to play simple tunes such as "Jingle Bells" and "Mary Had a Little Lamb." Vierra was able to identify these tunes from what he remembered before he became deaf.

This is the first time that such extensive and discrete electrical stimulations of the auditory nerve have been carried out in man.

Dr. Simmons explained that the purpose of the study was to gain further knowledge about hearing and about the possibilities of implanting artificial hearing devices in deaf people. The results suggest that speech communication via direct nerve stimulation might be possible in the future. However, it would require more research and certainly more than six wires in the nerve.

"We were justified in conducting this clinical trial because our laboratory has had extensive experience in permanently placing electrodes within the ears of experimental animals for many years. Electrical stimulation of the brain has been shown technically feasible," Dr. Simmons said.

The study was reported in a recent issue of SCIENCE, weekly magazine of the American Association for the Advancement of Science. It was carried out in cooperation with other scientists at the Bell Telephone Laboratories in Murray Hill, New Jersey.

The cause of Vierra's deafness is not known, but researchers think it was probably associated with a condition called retinitis pigmentosa which is an inflammation of the eye. Vierra has apparently had the condition "in some degree" since childhood.

Because Vierra is partially blind, probably due to that condition, he is able to see written messages only in large block letters. And this is how the researchers communicated to him. The condition, however, has not affected his speech.

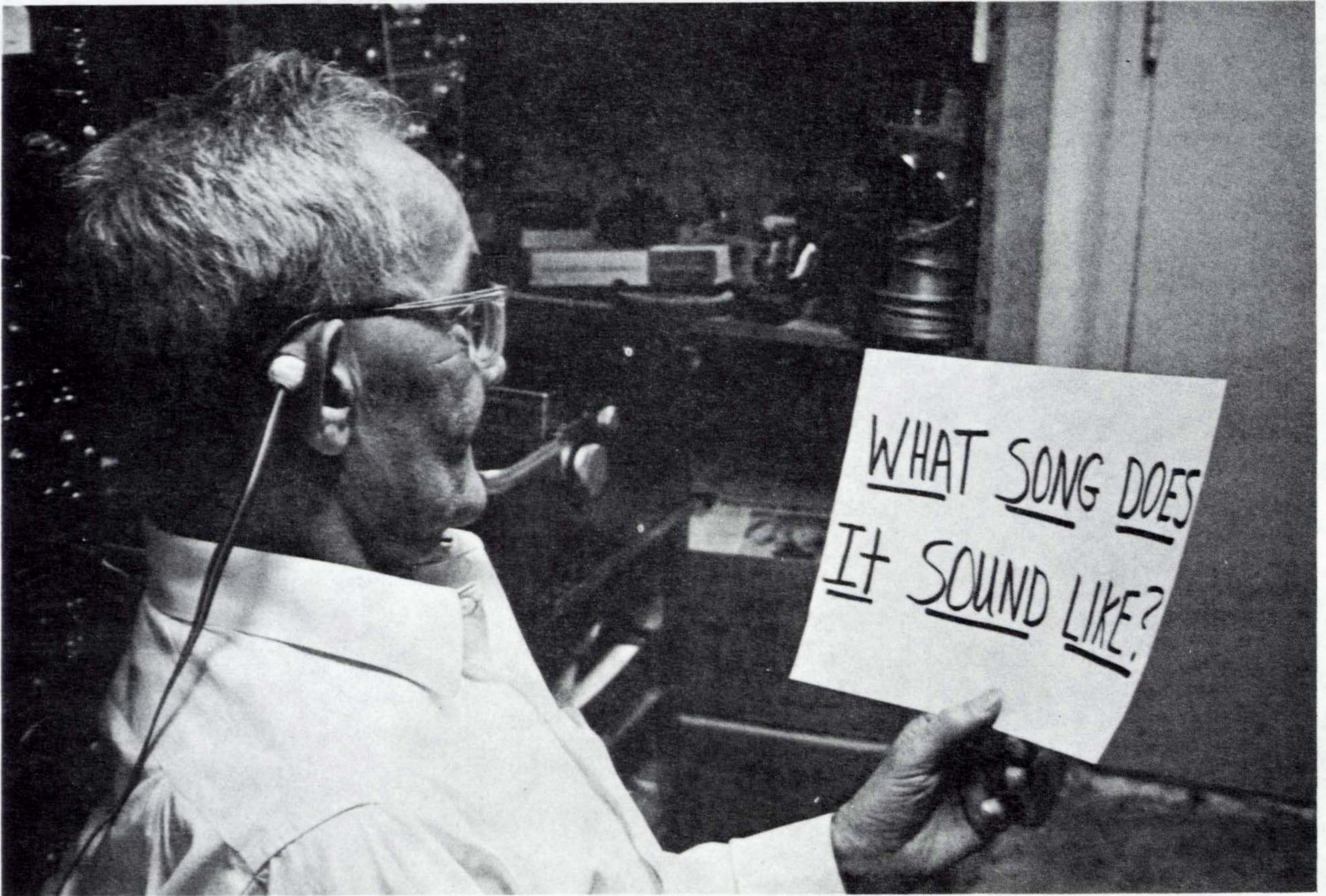
Vierra lives at home now. Transportation to and from the Stanford Medical Center is provided by the Veterans Administration Hospital in Palo Alto.

Dr. Simmons and Dr. Epley intend to continue to refine the techniques with the eventual long-term goal of learning about which types of "electrical sounds" can be eventually "understood" by a previously deaf person.

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(Mailed June 14, 1965)





ANTHONY VIERRA, a 61-year-old deaf man, "heard" two out of several tunes being used during an experiment in which Dr. F. Blair Simmons, assistant professor of surgery, and Dr. John M. Epley, a resident in otolaryngology of the Stanford University School of Medicine, stimulated his hearing nerve via electrodes connected behind his right ear. Because Vierra is partially blind, he can read messages only in large block letters.

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TO NEWS BUREAU, STANFORD MEDICAL CENTER, PALO ALTO, CALIF.

Subject: Anthony Vierra

Please send me a glossy print of photo above.

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