

## MEDICINE

# Throat Cancer Diagnosis

► A TECHNIQUE for analyzing a person's voice could be used to detect early stages of cancer of the vocal cords.

Although it does not replace a physician's internal throat examination, the diagnostic technique could serve as a screening test in patients with growths of the larynx. The technique evolved from a pilot study in the Air Force Cambridge Research Laboratories, Cambridge.

A patient merely records his voice, using an ordinary microphone, reading standard phrases. Analysis of the speech waveform, by techniques developed by Air Force scientist Philip Lieberman, would turn up certain characteristic patterns. Abnormal features would sound the alarm in this medical early warning system.

Tests were made with the tape-recorded voices of 32 selected speakers.

The technique for the early detection of diseased larynxes utilizes the pitch components of speech. Pitch is established by the rate of vibration of the vocal cords. The rate, in turn, is determined by varia-

tions of air pressure in the larynx and the effect of muscle tension.

This knowledge of the vocal cords together with the known structure of the waveform of normal speech led Mr. Lieberman to suggest waveform analysis of pitch variations as a possible diagnostic tool for pathological disorders of the larynx.

Essentially, the process involves a microphone, an oscilloscope, a camera and a computer. The speaker's voice, recorded on tape, is electronically displayed as a waveform on an oscilloscope. The waveform, photographed on 35 millimeter film, is programmed for computer analysis. Statistical measures of pitch perturbations, or small but rapid variations of pitch, are then computed.

Analysis of pitch perturbations clearly showed a marked departure from normal for 23 speakers in the test group. Their medical histories confirmed the existence of laryngeal disorders involving both benign and malignant growths.

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## MEDICINE

# Serum Hepatitis Carriers

► A LIVER DISEASE, sometimes transmitted by blood transfusions, kills about one out of every five persons over 40 stricken with the disease.

However, not one person under 35 died from this disease, known as serum hepatitis. These statistics were obtained in a survey of nearly 2,700 persons receiving blood transfusions at the University of Chicago Clinics.

Serum hepatitis is transmitted by injection of blood or blood derivatives contaminated with the virus disease. A needle, lancet or other instrument contaminated and not sterilized can transmit hepatitis.

Even the hospital barber who goes from one patient to another with razor, scissors and manicuring utensils could collect contaminated blood on his instruments and thus spread the disease.

There is some evidence suggesting that serum hepatitis is caused by the same virus as infectious hepatitis, and the problem is now under study at several laboratories.

The "great need" for a simple test to detect the blood donors who are carriers of serum hepatitis, the two physicians who made the survey reported in the *Journal of the American Medical Association*, 180:1079, 1962. Even without this test, the chances of spreading hepatitis by blood transfusions would be greatly reduced if the professional donor was "eliminated entirely."

The professional donor is six times more likely to be a carrier of hepatitis than a volunteer or a member of the patient's family, Drs. J. Garrott Allen of Stanford University and Wynn A. Sayman of the University of Chicago have found.

Attempts to overcome public apathy by

campaigns for blood donations have mostly failed in large cities for any long period of time. The physician is therefore forced to choose between the "greater risk" of withholding blood transfusion and the "lesser risk" of serum hepatitis from use of the professional donor.

Drs. Allen and Sayman selected at random the 2,696 persons studied from 11,627 patients receiving blood transfusions during a ten-year period. Hepatitis, if it occurred, appeared during the second month after transfusion in one-half the cases.

The over-all attack rate for all patients receiving transfusions was only three percent. Blood group, race and sex did not affect susceptibility to hepatitis, but the number of transfusions did.

Editorially, the *Journal* noted that 61% of the patients surveyed by Drs. Allen and Sayman had only one or two transfusions, and questioned whether such transfusions are therefore necessary (p. 1123).

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## MEDICINE

## No AMA Statement Yet On Smoking and Disease

► THE American Medical Association is edging closer to an official statement linking cigarettes and disease.

The AMA's Council on Drugs has pledged itself to study the relationship and make a report on the rapidly accumulating scientific findings. However, it will be at least a year before the AMA makes any statement for or against linkage of smoking and disease, Dr. William C. Spring, Jr., secretary

of the Council, said in Chicago. Sen. Maurice B. Neuberger (D-Ore.) gave the AMA a nod of approval in Washington for undertaking the study.

Sen. Neuberger told the Senate that the AMA decision was of the "utmost significance" in view of the eminence of the Council on Drugs in the fields of pharmacology and therapeutics. The AMA study plans came in response to a request from Sen. Neuberger that the AMA consider taking an official position on the tobacco issue.

The AMA decision to enter the tobacco controversy could not have been lightly made, Sen. Neuberger said, adding that "the evidence of tobacco's effect upon the nation's health has been shrouded in acrimonious controversy provoked in large measure by the ubiquitous tobacco industry. It would have been far simpler for the board (of the AMA) to have declined to embroil itself in this controversy."

The refusal of AMA up to now to make positive statements on the linkage of cigarettes and disease, however, has not stemmed from any pressure from the tobacco industry, a spokesman told *SCIENCE SERVICE*. The *Journal of the American Medical Association* has printed numerous studies implicating tobacco as a possible link with disease, but the official organization has withheld a definite statement until more evidence was in.

An unpassed resolution at the convention stated that the weight of scientific evidence distinctly indicates that cigarette smoking suggests a causal relationship with disease.

At the final meeting of the House of Delegates, governing body of the AMA, a total of 17 resolutions denouncing the Administration's social security King-Anderson bill were passed.

Also passed were other resolutions against making social security compulsory for doctors. At the same time, the doctors were urged to help perfect state cooperation with the Kerr-Mills Act, and to continue to serve the aged.

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## PHYSICS

## Magnetic Field Reverses Direction

### See Front Cover

► THE FIRST experimental evidence that a magnetic field reverses its direction or sign as it passes through a superconducting thin film was revealed by scientists at International Business Machines Corporation, Research Laboratory, Zurich, Switzerland.

The reversal was first predicted by Prof. Pippard at Cambridge University in 1953 and the actual change has now been observed for the first time. The observation was made during an experiment to determine how magnetic fields penetrate superconducting thin films.

The photograph, seen on this week's front cover, shows clearly the reversal in magnetic field direction by the difference in direction between the upper (thick) wave form, representing the signal from a sensing coil, and the lower reference signal.

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