BIOTECHNOLOGY

Computer Heart 'Pictures'

➤ A NEW mathematical technique has been perfected with the aid of a computer to take electrical "pictures" of the human heart.

The technique, developed by Drs. Herbert Gelernter and James Swihart, mathematical physicists at International Business Machines Corporation's Watson Research Center in Yorktown, N. Y., was made possible by writing a computer program that accounted for the complex variations in electrical fields of the lungs, blood vessels, skin and muscles. An IBM 7090 computer calculated a general variable formula that relates the heart's activity directly to surface pulses in the body.

The large muscle that forms the human heart is put into motion by pulses from the brain. Each cell and nerve acts as a tiny transmitter of electrical signals. These signals form a measurable electrical field around the heart.

Doctors use an electrocardiogram, a device that registers electrical pulses on the surface of the body from the heart, to measure the heart's electrical activity indirectly.

The major problem in this type of measurement has been in the variation between the electrical activity in the heart itself and the distorted picture of the signals that the electrocardiogram picks up on the body's surface.

Honeywell

ELECTROCARDIOGRAM BY TELEPHONE — A public health nurse, Mrs. Betty Jeffery, of Alexandria, Va., is trying out a battery-operated device, called a Honeywell Cardioview after the manufacturer, that will simplify the work of taking electrocardiograms. Donald Mitchell, 13, has rheumatic fever, and like other patients with potential heart trouble, finds it easier to have his heartbeats tested at home. The impulses are transmitted to a Washington, D. C., computer by Dataphone.

Now the new mathematical technique allows doctors to account for these distortions and variations in the electrical pulses that originate in the heart and are detected on the skin.

The general formula will help physicians interpret electrocardiograms (EKG's). It also will enable heart researchers to correlate much of their experimental data about direct measurement of the heart's electrical activity.

Drs. Gelernter and Swihart reported details of their new technique in the Biophysics Journal, July, 1964.

• Science News Letter, 86:52 July 25, 1964

MEDICINE

Cancer Producers Found In Charcoaled Meats

➤ LUSCIOUS charcoal-broiled steaks contain several cancer-producing chemicals, it has been discovered at the University of Chicago Medical School.

Drs. W. Lijinsky and R. Shubik reported In Science 145:53, 1964, that they broiled 15 steaks and extracted the fat. They were able to identify at least 15 hydrocarbons known to produce cancer, from previous studies of smoking and cancer production from coal-tars. Benzo(a)pyrene, the most highly concentrated chemical in the fats, was found in amounts exceeding the concentration found in the smoke from 600 cigarettes.

The cancer-producing agents appear to be produced by the dripping of fat onto the charcoal. The fat burns, sending up decomposed products in the smoke. The chemicals are absorbed by the fat on the steak and then eaten.

• Science News Letter, 86:52 July 25, 1964

BIOTECHNOLOGY

Automated Survey Finds Unknown Heart Disease

➤ A NEW computer system of taking electrocardiograms (EKG's), or electronic tracings of the heartbeat, is revealing unsuspected heart ailments. A pilot run has just started in Alexandria, Va.

The system helps patients and doctors alike. Public Health nurses are carrying a portable electronic device into 500 homes in the first test, taking the EKGs and transmitting them directly by Bell System Dataphone from the individuals to a computer system in Washington, D.C. About one third of the participating persons have never had an EKG.

The U. S. Public Health Service's Heart Disease Control Program is cooperating with the Alexandria Health Department in the first survey of its kind in the country. The automated system was developed by the PHS and tried out in Cleveland at a meeting of the 1962 American Hospital Association.

It is expected to be tried in cities all over the country.

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Questions

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