

MEDICINE

Smoking Affects Heart

Tests show that tobacco has a definite effect on heart muscle, even in normal persons. Symptoms of "tobacco heart" are chest pain, irregular beat, breathlessness and dizziness.

► SMOKING AFFECTS your heart, whether you are a normal person or one with heart disease.

Tests showing that smoking has a definite effect on the heart muscle itself, even in normal persons, were reported by Dr. Isidore E. Buff of Charleston, W. Va., in the *Journal of the American Medical Association* (Feb. 12).

In both normal persons and patients with disease of the heart's arteries, smoking a single regular cigarette was followed by significant increase in heart rate and blood pressure, Drs. Henry I. Russek, Burton L. Zohman and Virgil J. Dorset of the U. S. Public Health Service found in tests at the Public Health Service Hospital on Staten Island, N. Y. They also reported that smoking affects the heart muscle and nerves, rather than its arteries.

Dr. Buff used the ballistocardiograph in his tests of 400 normal men and women aged 20 to 40. This instrument measures the "kick" of the heart, something like the recoil of a gun, and gives an idea of the strength of the heart's contraction and the state of its muscle.

Among the 400 normal persons, abnormal changes were found after smoking in five percent of the 20- to 30-year-olds and in 15% of the 30- to 40-year-olds. The change with age is to be expected, Dr. Buff pointed out, because the older ones "are approaching the 'coronary age' and the effect of cigarette smoking over a long period of time is beginning to be noticeable."

Dr. Buff could not say how many of those normal persons showing abnormal response to cigarette smoking would develop coronary artery disease. He felt, however, that it is "highly desirable that these patients stop using tobacco in any form."

Dr. Russek and associates reported that "tobacco heart" is a real condition, not just an old-fashioned notion. It can be confused with coronary artery disease, such as angina pectoris, unless proper tests are made. Symptoms are dull, heavy pain in the heart region, irregular heart beat, palpitations, breathlessness on effort, dizziness and changes in both ballistocardiograms and electrocardiograms. In the patients they tested, symptoms disappeared when the patients stopped smoking. In these patients, "denicotinized" cigarettes caused markedly less abnormal heart responses.

The "denicotinized" cigarettes, however, caused the same disturbances in heart disease patients as regular cigarettes, Dr. Russek's studies showed.

The idea that whisky protects the heart during smoking is "purely an illusion," Dr. Russek and associates reported. Whisky has

a slight effect on the circulation only and does not counteract the effect of tobacco on the heart.

Smoking, his group found, does not "present a direct danger" to the patient with coronary artery disease by constricting the heart's arteries. But it has other "undesirable" effects, from increased heart rate and blood pressure to "hacking and coughing, diminished vital capacity, cardiospasm and gastritis." They call it "unsound" to permit smoking in heart patients, since they are already below par in heart and lung efficiency and physical condition.

Heart disease patients, they advised, should strive for "peak physical fitness at a safe level of activity," just as athletes do and, like athletes, should not smoke because smoking reduces physical fitness for exertion.

Science News Letter, February 26, 1955

EDUCATION

100,000 Want College Yearly But Lack Funds

► APPROXIMATELY 100,000 qualified American high school seniors each year have a strong desire to go to college, but cannot afford it.

It is a lack of money and not motivation or academic qualifications that prevent these students from going on to higher education, Dr. Robert J. Havighurst, professor of education at the University of Chicago, told the American Council on Education's subcommittee to study a Federal scholarship program in Washington.

The sub-committee, made up of representatives from both public and private educational institutions and organizations, is now engaged in analyzing a group of surveys to find a means of helping a larger proportion of qualified students get to college.

Dr. Havighurst, reporting the motivation of high school seniors in wanting to go on with their education, said that about 300,000 graduates each year are in the top one-quarter of their classes, but never go to college. He placed these students in three categories:

1. About 100,000 boys and girls who have the necessary grades and a very strong desire to go to college, but not enough money.
2. Another 100,000 who also have the grades, and may or may not have the money, but who have only a weak motivation to continue their education after high school.
3. A third group numbering about 100,-

000 who, although they may have both the money and desire, are felt to be "unfitted" for college and in all probability would not be recommended by their high schools.

Science News Letter, February 26, 1955

TECHNOLOGY

Transistors Made By Automatic Machine

► A MACHINE that automatically makes transistors, tiny amplifiers replacing vacuum tubes for many uses, is being developed by Bell Telephone Laboratories.

In less than one minute, the device, known as Mr. Meticulous, carries out more than 15 steps in the production of experimental transistors. First it takes a tiny bar, almost as thin as a human hair, of semi-conducting material such as germanium or silicon and examines it electrically.

If the minute sliver is acceptable, the machine attaches a fine gold wire to a critical point on the bar with an accuracy of one twenty-thousandth of an inch. Then it connects this wire to one of the four wires leading out of the transistor, flips the bar end over end, and repeats the entire operation with another wire on the opposite side. Finally, it makes electrical tests on the completed transistor.

Advantage of the device, developed by R. L. Wallace of Bell Laboratories, is that standard transistors are rarely produced. The machine may some day be a pilot model for industrial machines for assembly line manufacture of transistors.

Science News Letter, February 26, 1955



MAKES TRANSISTORS—"Mr. Meticulous," a robot device for assembling tiny experimental transistors, goes through its paces for Bell Telephone Laboratories' scientist R. P. Riesz. Inset shows a completed transistor compared with the edge of a dime. The wire shown is almost as thin as a human hair.