

MEDICINE

Cholesterol, Accused Killer

Intensive research is under way to determine whether or not the fatty substance, cholesterol, is responsible for hardening of the arteries, Faye Marley reports.

► IT HAS COME to the point where one is afraid to eat eggs for breakfast or butter a roll for dinner, much less drink a glass of whole milk at bedtime. Why? Because cholesterol is found in animal fats and eggs. And because cholesterol is suspected of causing atherosclerosis, the narrowing or closing of the arteries leading to coronary attack.

And it may be true. Only research on a larger scale than has been attempted so far will answer the question.

Dr. Irvine H. Page, director of research at the Cleveland Clinic Foundation, a former president of the American Heart Association, has a \$50,000 grant from the National Heart Institute of the U.S. Public Health Service to make plans for a major diet study to learn if there is a decline in atherosclerosis after a reduction in the cholesterol level of the blood. This may involve studying thousands of persons, in their home environment.

Role of Cholesterol Studied

The National Heart Institute for the fiscal year 1960 granted approximately \$1,300,000 in support of research projects primarily concerned with the relation of nutrition to arteriosclerosis, the large majority of which is in atherosclerotic form. Cholesterol is included in the nutritional studies.

Also granted during the same period by NHI was approximately \$1,500,000 for biochemistry studies that will include some phases of cholesterol and its metabolism.

Among the numerous researchers interested in the cholesterol relationship to atherosclerosis is Dr. Weldon J. Walker, chief of cardiology, Walter Reed Army Medical Center in Washington.

Dr. Walker, with others at Harvard Medical School and Peter Bent Brigham Hospital, Boston, Mass., has studied the effect of weight reduction and caloric balance on serum lipoprotein and cholesterol levels. He hopes to do further research along these lines.

In an interview, Dr. Walker said there are obviously other factors besides high cholesterol levels in the blood that are causing so many cases of coronary atherosclerosis. Blood clotting ability may be at fault, for example.

"In population studies throughout the world, however," Dr. Walker said, "among the middle-aged whose average serum cholesterol level is over 220 milligrams, the death rate is high. Where the average serum cholesterol is under 200 milligrams it is low."

Dr. Walker said some of the principal evidence linking atherosclerosis with altered cholesterol metabolism has been in the

results of feeding laboratory animals cholesterol and following other dietary procedures with them.

"Experimental lesions produced in this way," he said, "are always preceded by an elevation of serum cholesterol and the lesions themselves have a high cholesterol content."

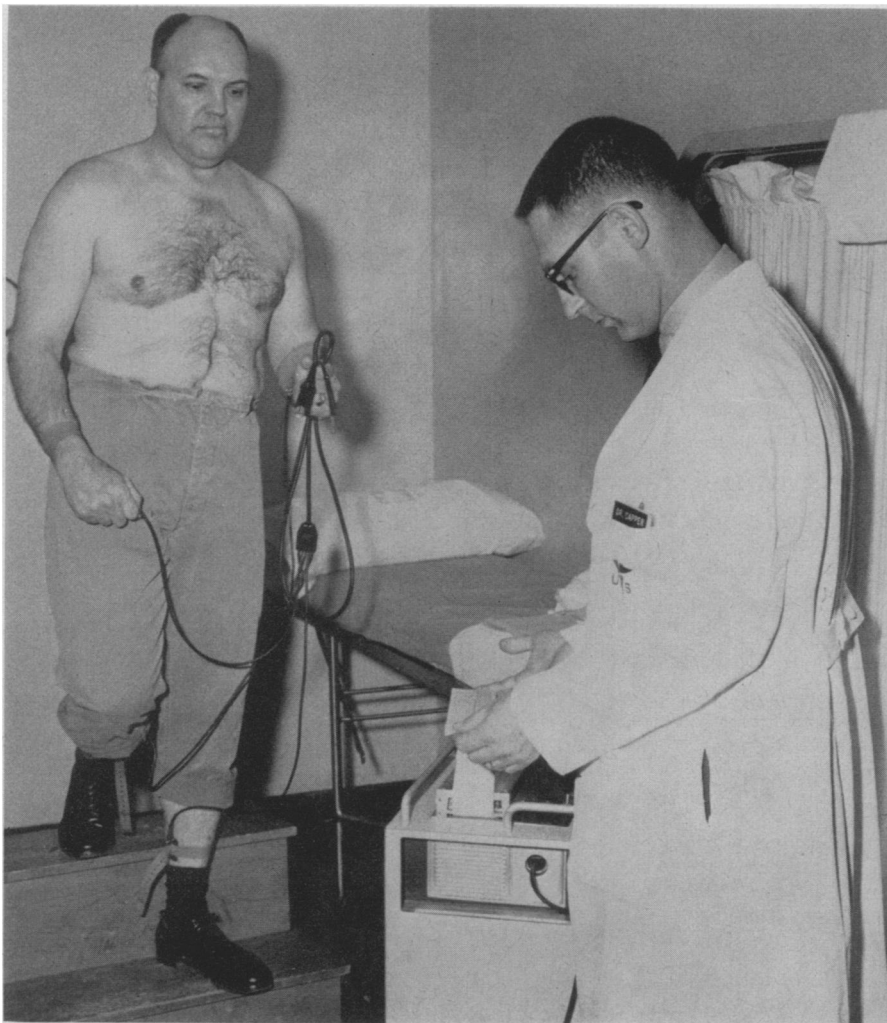
An increased incidence of atherosclerosis has been observed in diseases associated with hypercholesteremia (an excess of cholesterol in the blood) such as xanthoma, tuberous, myxedema, diabetes and nephrosis. Individuals who suffer coronary thrombosis, or myocardial infarction, early in life tend to have higher levels of serum cholesterol and lipoproteins than the general population.

There is no evidence, however, that dietary cholesterol elevates serum lipid levels or causes atherosclerosis in humans, he said. The total circulating cholesterol in humans is largely endogenous, originating with the organism.

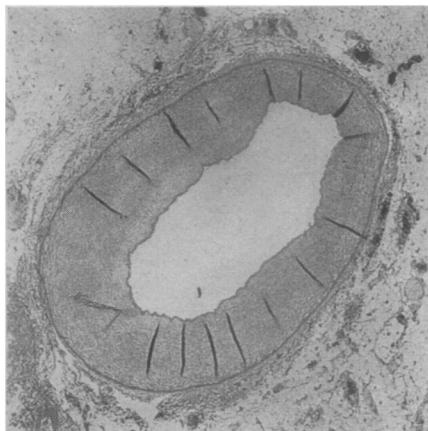
Dr. Walker said that weight reduction has been shown to lower cholesterol and that fat persons have a higher death rate than thin people. Insurance policy holders who are so fat that they must have substandard policies have lost weight and consequently reduced their death rate.

"Since heart attacks were recognized as coronary thrombosis some 50 years ago," he said, "the Metropolitan Insurance Company has paid out 50 times as much for this disease as it did for tuberculosis 50 years ago when TB was the leading cause of death."

There is apparently a protective quality for women in their hormones before meno-



STRESS TEST—The effect of going up and down stairs is being recorded by electrocardiograph in a series of stress tests at Walter Reed Army Medical Center. The simulated heart patient is Michael Benyak and the physician is Capt. Robert S. Capper.



FATTY DEPOSITS — Circling an artery are deposits of cholesterol, the fatty substance suspected of causing coronary atherosclerosis, one of the leading causes of death. If unchecked, thickening of arteries advances until there is no room for blood to circulate.

pause or hysterectomy, so that atherosclerosis is rare among them.

Almost universally among adult American males, Dr. Walker said, latent atherosclerosis exists without symptoms. A study of American soldiers killed in Korea showed 77% had demonstrable coronary sclerosis.

"More persons die from coronary atherosclerosis," he said, "than from all forms of cancer. It is like rust in the fuel lines of an automobile. Ordinarily a heart attack is either caused by a clot forming on top of the atheromatous plaque, largely made up of cholesterol, or by coronary thrombosis, formation of a clot in a branch of the coronary arteries that supply blood to the heart muscle, resulting in obstruction of the artery."

Dr. Walker believes that there is no point in getting cholesterol tests inasmuch as the count varies from hour to hour, and its level in the blood might be up as much as 100 points the next day. He considers the important thing is to maintain the weight at a lean level.

To keep cholesterol to a minimum, Dr. Walker advises drinking skim milk or buttermilk, which have most of the vitamins and minerals of whole milk without the animal fat and contain half the calories.

He himself eats no butter, advises corn oil as cheaper than safflower oil for use in preparing mayonnaise and says with a bit of salt such oils are a satisfactory substitute for butter on toast. Eggs should be poached or boiled, he said, and fried foods should not be encouraged.

Even patients with peptic ulcer, he advised, will "do just as well on a high-protein Sippy mixture made from skim milk, skim milk powder, egg white and flavoring," as on the conventional high fat program. The amphoteric action (combining with both acids and bases) of proteins makes them especially effective in neutralizing gastric acidity.

In general it is wise to avoid saturated fats, which include butter, whole milk,

most cheeses (except cottage cheese), ice cream, shortenings and conventional margarines.

A saturated fat is one containing a full complement of hydrogen atoms along the carbon chain that forms the backbone of the fat molecule. If the chain is lacking one pair of hydrogen atoms, the fat is called monounsaturated. The main fat of this type, oleic acid, constitutes about 80% of the fat in olive oil. Oleic acid seems to be "neutral" in its effect on serum cholesterol, although some experts believe it may cause a slight elevation.

The oils shown to have the greatest cholesterol-lowering effects are the polyunsaturated fatty acids, which are lacking two or more pairs of hydrogen atoms. The most abundant is linoleic acid, which constitutes 40% to 55% of corn, soybean and cottonseed oils. Because linoleic acid cannot be manufactured by the body and is probably a necessary nutrient, at least for infants, it is often called an essential fatty acid.

The American Heart Association, which observes February as American Heart Month, has recommended through its Central Committee for Medical and Community Program a reduced fat consumption.

"Based on the best scientific information available at the present time," the Committee advises reasonable substitution of vegetable oils and other unsaturated fats for animal fats in the diet as a possible means of preventing atherosclerosis and lessening the risk of heart attacks and strokes.

The Committee urged, however, that medical guidance be sought before individuals make specific changes in the fat content of their diet, saying that fat reduction is probably of greatest potential benefit to these three groups:

Those who are overweight, those who have already had a heart attack or stroke, and men whose personal and family histories suggest that they may be particularly susceptible to atherosclerosis.

• Science News Letter, 79:106 February 18, 1961

Do You Know

More than 74,000,000 motor vehicles were driven on U. S. roads in 1960.

There are more than 108 ethnic groups living in the USSR, the 1959 census shows.

When Americans go to market, they can choose from as many as 5,000 different foods.

About 265,000 Americans died of cancer in 1960.

More than three and a half billion barrels of petroleum products were used in the United States in 1960.

Twenty-five billion packs of cigarettes are sold each year in the U. S.

• Science News Letter, 79:107 February 18, 1961

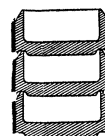
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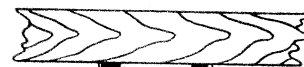
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