

## PHYSIOLOGY

## Stress Boosts Cholesterol

THE MANNER in which high tension living boosts the body's cholesterol count to a dangerous level has been suggested by the research of two scientists.

Excessive amounts of cholesterol in the blood, long associated with the formation of atherosclerosis, can be caused by overactivity of the adrenal glands which, in turn, is stimulated by stress.

Drs. Eleazar Shafir, a visiting scientist from Israel, and Daniel Steinberg, chief of the National Heart Institute's metabolism section, experimented with dogs. They found that the animals exhibited a powerful fat-mobilizing pattern of hormone activity which involves secretions of the inner core (medulla) and the outer "rind" (cortex) of the adrenal.

It is a well-known fact that stress can cause overactivity of both of these sections of the adrenal glands which are the size of a prune and located atop the kidneys. It was not previously known, however, that the glands' secretions, accelerated by stress, could increase the amount of cholesterol and other fatty substances in the blood.

The secretions responsible for the increase

were found to be adrenalin, the hormone excreted by the inner adrenal during intense emotional excitement, and cortisone, the steroid excreted by the adrenal cortex in response to heat and cold, injuries, infections and other stresses.

Adrenalin injections alone were found by the physician-biochemists to be capable of raising the blood cholesterol and other lipids in normal dogs. But when the dogs were deprived of their normal cortical secretions, by removing their adrenal glands, this effect of the adrenalin injections was lost. When the cortisone injections were used to "replace" the missing cortical secretions, the fat-mobilizing potency of the adrenal was fully restored.

The fat-mobilizing action of this combination of adrenal "stress hormones," as seen in dogs, is strong enough to suggest the possibility of a direct cause-and-effect relationship between adrenal overactivity and the rise in blood lipids seen in various studies of men subjected to disturbing emotional experiences or sustained high-level job performance at a forced pace.

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a mining operation. For example, a worked-out quarry has been filled with water and made into a recreation area. In Fresno, an adobe brick operation also helped level the ground for irrigation. Recovering resources does not need to mean destruction to good farmland. It is possible to strip off the top soil and "bank" it until the operation is completed, at which time the soil can be replaced.

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## MEDICINE

## More Lung Cancer Than TB in Middle-Aged Men

THE INCIDENCE of lung cancer is now twice as great among middle-aged men as tuberculosis is. Once a leading killer, TB is curable in a majority of cases, while lung cancer is rarely cured.

This was indicated by a long-term study by Drs. Katherine R. Boucot and David A. Cooper of the Philadelphia Pulmonary Neoplasm Research Project.

Six years ago 6,137 men over 45 agreed to have annual or semiannual chest X-rays and to answer questions about symptoms of lung disease. Because only about five percent of lung cancer patients survive five years, the researchers hoped to detect lung cancer at the earliest possible stage and determine whether in these early cases they could increase the present low cure rates.

During an average period of six years, 31 men developed lung cancer. Over the same period, 16 men developed tuberculosis, and an additional eight former TB patients showed reactivation of the disease.

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## DEMOGRAPHY

## Population Hits Resources

SHOCK WAVES from today's population explosion are being felt in the United States.

Outwardly it may appear only that cities are becoming larger. This is evidenced by a steady march of suburbs farther from the downtown hub.

But other things are happening, too. This urban growth is quietly locking up some of the nation's treasures in natural resources.

In California, for example, the problem is considered so serious that strong action has been taken in a few instances to protect valuable natural assets. California gains about 500,000 persons a year.

These families require the usual new roads, houses, stores, industrial and municipal facilities. The buildings themselves require such raw materials as sand, gravel, crushed stone, limestone, cement and gypsum. Hundreds of thousands of tons of these building materials are used every month in California. But, as pictured by Harold B. Goldman, the California Division of Mines sand and gravel expert, here is what is happening:

Producers of these low-cost raw materials at first start working suitable deposits close to the consuming areas. Haulage is a significant cost factor. But the expanding community finally engulfs the mining operation.

The new residents consider the operation a nuisance and bring pressure on civic leaders for ordinances to govern load, speed and routes of trucks, to limit the producer's hours of operation and to force him into dust-control measures. Under these harassments, the operator usually moves out.

Once he could find other good sources of clay, rock and gravel within economical hauling distance. But now these deposits have been depleted or submerged by urban expansion. Raw materials are now imported from as far as 40 miles away with the consumer paying the bill.

An additional haul of ten miles, Mr. Goldman estimated, adds about 50 cents (about 25%) to the cost of a ton of gravel. Often the material is of poorer quality, so the new houses cost more, are inferior, and have higher maintenance costs.

Many undeveloped mineral deposits are now ringed by population centers and cannot be exploited owing to the difficulty of hauling materials through these communities.

Alarmed at the subtle but insidious effects of its explosive population growth, Santa Clara County implemented a hard-boiled plan to protect agricultural land from the onslaught of urbanization. In 1958, it set aside 40,000 acres in "greenbelts" zoned exclusively for farm use. No factories or stores are allowed.

In Los Angeles, consulting engineers were called to study sand and gravel resources in the San Fernando Valley. Areas suitable for production have been firmly zoned as gravel-pit sites. After depletion, they are to be restored for home sites.

Pits and quarries can be made more acceptable in a community through camouflage using a protective strip of trees and shrubs to make a park-like area. On occasion, unusual by-products are obtained from



**METAL SORTER**—A "metal sorter" has been invented by George Martin of the General Electric Company that identifies different look-alike metals commonly used in nuclear reactors. The device is basically a milliammeter with a single clamp-on lead and another lead with a carbon steel file on the end.