LOOKING FOR HEART TROUBLE—Blood samples from 550 cadets are analyzed on this impromptu production line supervised by Lt. Col. Lawrence J. Milch (in background) of the Air Force School of Aviation Medicine, Randolph Field, Tex. He is looking for a tendency to early heart disease in seemingly sound cadets.

PHYSIOLOGY

Heart Disease Tendency

Air Force scientist seeks blood tests to show, long before the first attack, which apparently healthy men and women may be vulnerable to heart disease.

➤ PREDICTION OF a tendency to heart disease in healthy young men and women long before the first attack is the aim of a long range study started by Lt. Col. Lawrence J. Milch of the U. S. Air Force School of Aviation Medicine at Randolph Field, Tex.

Prevention of disastrous plane crashes that can occur if the pilot's heart stops while he is at the controls is the prime reason the Air Force has undertaken the study. But non-flying men and women will certainly benefit if Col. Milch achieves his goal of finding tests to detect a tendency to heart disease.

Present physical examinations of pilots, though rigorous and frequent, do not detect such a tendency.

Samples of blood from 550 cadets of the incoming class at the U. S. Military Academy at West Point, N. Y., are now being examined at the Randolph Field Laboratories. These young men were all screened for health before entering the Academy and for the next four years will live under the same conditions, eat the same diet and be subjected to the same physical and mental strains. The blood tests will be repeated at the end of the cadets' second year and again just before they receive their commissions. The men will be followed throughout their military careers for a further check on the value of the tests.

On the West Point blood samples Col. Milch is using just two tests. They are to determine the relative efficacy of total blood serum cholesterol, and of the concentration and distribution of different blood serum fatty proteins in the ultra-centrifuge with regard to their ability to cause a kind of fatty degeneration of the arteries.

The overall project includes two other tests: 1. The ratio of phospholipids to cholesterol in blood serum, and 2. The concentration of blood serum fatty proteins determined electrophoretically.

Disturbances in the relative amounts of cholesterol, fatty proteins and phospholipids have been implicated as playing a part in causing artery degeneration and through that in heart disease. If so, picking up such changes very early may be the means of detecting and, perhaps by diet, preventing further development of a tendency to heart disease.

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BIOCHEMISTRY

Vitamin Lack Linked To Artery Hardening

➤ VITAMIN LACK and protein may have more to do with hardening of the arteries than faulty fat utilization.

Vitamin B-6, or pyridoxine, is the one that may be needed to keep arteries healthy.

This view, reversing some present ideas, comes from Drs. James Rinehart and Henry D. Moon, pathologists in the University of California School of Medicine, San Francisco.

They find that hardening of the arteries starts with deposits of mucus-like material in the lining of the blood vessel walls, rather than with deposits of the fatty chemical, cholesterol. Cholesterol and other fatty chemicals are laid down in the mucoid formations.

The mucoid deposition is progressive with age but is not necessarily a normal process. Finding that hardening of the arteries, or arteriosclerosis, begins with mucoid deposits suggests that the disease is more closely related to the body's handling of protein than to its handling of fat.

Because this picture of human arteriosclerosis closely parallels that produced in monkeys by a diet deficient in vitamin B-6, Dr. Rinehart believes B-6 lack is worth considering as a cause of the disease in humans.

The new view of artery hardening is based on studies of the arteries of 250 persons, some of whom had died of coronary thrombosis. New staining techniques helped the scientists differentiate substances found in the artery walls. The studies are reported in *Circulation* (Oct.).

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PHYSIOLOGY

How A-Bomb Particles Penetrate Human Skin

➤ WHEN AN A-bomb explodes, does its tremendous force hurl minute particles of dust and other matter through the air with such force that they penetrate the skin of persons in the immediate vicinity?

This is the subject of research being done by Dr. Benedict Cassen and Brian Dunne at the University of California's Atomic Energy Project.

"If such particles are radioactive, they could be hazardous upon penetration of the skin," Dr. Cassen points out. "One objective of our research is to determine under what conditions penetration might occur."

A "needle-less" hypodermic syringe that "shoots" solution through the skin by the use of a supersonic jet device is being used in the initial phase of the study. This phase is concerned with the behavior of the jet.

The jet stream is observed by means of a spark shadowgraph. This instrument generates a flash so brilliant that the detailed shadow of structural features of the stream can easily be recorded in less than one-millionth of a second.

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