MEDICINE

Starvation Affects Heart

The heart grows smaller when food intake is reduced to that of a semi-starvation diet. At the end of six months the subjects showed the signs of famine victims.

➤ WHEN a man is on a semi-starvation diet, his heart grows smaller.

In the Minnesota Experiment, made at the University of Minnesota in Minneapolis with 32 conscientious objectors during World War II, X-ray measurements of heart size showed that the heart volume decreased 17 percent during six months of semi-starvation.

These findings, contrary to statements "in every major textbook of physiology since 1900," are reported by Drs. Henry Longstreet Taylor and Ancel Keys in the journal, SCIENCE (Aug. 25).

The brain, on the other hand, and the skeleton and the proteins of the blood serum remain almost intact during semi-starvation.

Fat, muscle, liver and skin, like the heart, undergo large losses.

But although the heart grows smaller, the work done by it during starvation decreases by about half. This is a protective change that can be considered an adaptation of the body to the stress of starvation.

The way in which the body adapts to a starvation diet, however, is quite different from the way it adapts to such stresses as high-altitude living, heart disease or an increase in temperature of the environment, the Minnesota scientists point out.

Much of the adaptation during semi-starvation is, they state, "an automatic consequence of the use of the body itself as fuel for the metabolism. The life of the organism is prolonged or maintained closer to normal than would otherwise be the case by the rather desperate expedient of reducing the mass activity of the organism. This mechanism, it seems to us, is entirely passive and produces major limitations and stresses of its own."

In contrast, the man who has to live at a high altitude where the atmosphere has a lower partial pressure of oxygen, achieves a more positive adaptation.

"He reduces his demand for high rates of oxygen supply by reducing the intensity of physical work, but does not alter his oxygen use or rate of life at rest or with moderate activity. Adaptive mechanisms provide oxygen to the body in normal amounts for all but extreme exertion. The changes include an increase in red (blood) cell concentration, a higher rate or pulmonary (lung) ventilation and a change in the acid-base balance of the blood."

The man who travels from a cool to a hot environment, the scientists state, adapts to this stress by a more efficient elimination of heat from the body through an improved performance of heart and blood vessels and, apparently, through a reduction in basal heat production. Safety with a high rate of sweating is assured by a change in the composition of the sweat.

The men in the Minnesota Experiment lived for six months on a diet of potatoes, cabbage, turnips and cereals with only a few grams of animal protein a week. The diet provided an average of 1,570 calories daily, or slightly less than half the 3,492 calories the men consumed each day of a three-months control period before the semi-starvation diet.

At the end of six months of this diet, the men had lost 24% of their body weight and showed the classical signs and symptoms of famine victims, such as dropsy, anemia, disturbed heart and kidney function, weakness and depression. They lost strength and endurance to a marked degree, and said they felt "as if they were rapidly growing old. They felt weak and they tired easily. They moved cautiously, climbing stairs one step at a time and obviously reduced unnecessary movements to a minimum."

Science News Letter, September 2, 1950

MEDICINE

Powerful Drug, Tapazol, Treats Thyroid Trouble

➤ TRIALS of a new drug for treating certain kinds of thyroid trouble which is 25 times as powerful as one of the anti-thyroid drugs now used are reported by Drs. William S. Reveno and Herbert Rosenbaum of Harper Hospital and Wayne University College of Medicine, Detroit, (JOURNAL AMERICAN MEDICAL ASSOCIATION, Aug. 19).

The new drug is called tapazol, short for l-methyl-2-mercaptoimidazole. It is not yet on the market for general use. The Detroit doctors got their supply from the Lilly Research Laboratories.

Because it has been tried on only 18 patients for six months, the results, though promising, are considered preliminary. It was used for the kinds of thyroid trouble in which the gland is overactive, such as cases of toxic goiters.

It is "fully as efficient as thiouracil and propylthiouracil" and 25 times as potent as the latter drug. It differs chemically from these well known anti-thyroid drugs in having a five-membered rather than a six-membered ring structure.

Science News Letter, September 2, 1950

AERONAUTICS

Eight-Bladed Propellors For Turbo-Prop Engines

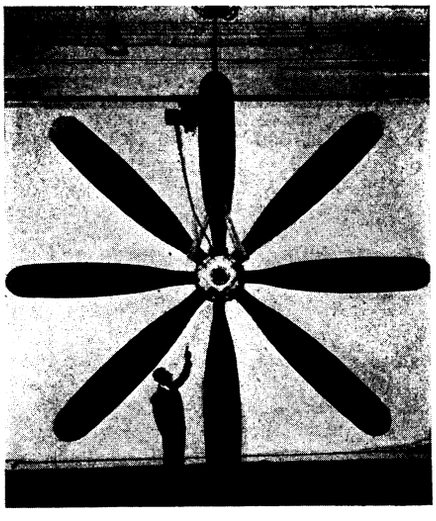
➤ EIGHT-bladed giant propellers over 19 feet in diameter, said to be the world's largest and most powerful, were revealed in Caldwell, N. J., by the designer and builder, the Curtiss-Wright Corporation.

They are designed for the U. S. Air Force for use on speedy planes equipped with gas turbine engines, turbo-props of 10,000 to 15,000 horsepower. They are dubbed the "Octoprop."

The Octoprop dwarfs in size and performance all previous propellers for either reciprocating or turbo-prop engines, officials state. The propeller is a dual-rotation type. Two sets of four blades whirl in opposite directions on a specially geared shaft. They give thrust enough to lift a fully-loaded plane of the giant four-engined DC-6 type.

The blades of the Octoprop may be feathered, or turned at an angle to reduce drag in the event of engine failure. They may be reversed in action for use as an aerodynamic brake to shorten landing runs. Among other features are automatic constant speed operation and provision for heated air de-icing. The eight blades are of hollow steel construction.

Science News Letter, September 2, 1950



"OCTOPROP"—The eight-bladed, 19-foot diameter, dual-rotation propellor dwarfs William E. Burns. Designed for an engine of 10,000 to 15,000 horsepower, it has a rated thrust in excess of the force required to lift a 4-engined transport of the Douglas DC-6 type off the ground with maximum load.