

## MEDICINE

# Help Your Heart Beat True

Valentine's Day may bring you many greeting hearts but none so strong as the fist-sized pump in your chest. Disease stops many but most work faithfully on.

By JANE STAFFORD

► VALENTINE'S DAY brings a shower of hearts, some comic, some romantic. It is a day for lovers to check the state of their hearts, and it is a day when all of us might think about checking the state of the wonderful muscle that beats true as long as it possibly can.

For while hundreds of thousands of hearts weaken and die each year, the real miracle is that so many go on for so long. True, diseases of the heart and circulation killed 771,000 Americans in 1952, latest year for which figures are available from the National Office of Vital Statistics. But some 150,000,000 Americans lived on.

Their hearts were strong enough to go on beating 72 to the minute every minute of every day and night. As a pump the heart has an efficiency that any manufacturer of pumps or motors would be glad to achieve with his mechanical device. To equal the heart's efficiency as a motor, a gasoline engine such as the one in your car would have to be capable of running 1,000,000 miles without attention.

Every day the normal human heart pumps from nine to ten tons of blood, driving it through miles of arteries and veins. In the biblical lifespan of three score years and ten, which many persons in America now outlive, the heart delivers nearly three billion thrusts to pump more than 40,000,000 gallons of blood.

## Rest Period for Heart

All this power is housed in an organ that measures on the average 5 by 3½ by 2½ inches in a grown person, and weighs about three-quarters of a pound.

How does this little pump achieve so much? Two things undoubtedly help: 1. The kind of muscle from which the heart is made. 2. Rest periods.

The fibers of the heart muscle criss-cross in many layers running in different directions. This gives strength in the same way that laminated material gets strength even when made of many thin layers. It gives the heart more strength than any other muscle in a man's body. Only one human muscle has more power. That is the contracting uterus in a woman's body when she is giving birth to a baby.

And the heart does rest, even when you are working. With every beat, the heart contracts to force the last drop of blood out of its hollow chambers, called ventricles.

This contraction lasts for three-tenths of a second. Then it relaxes, for five-tenths of a second. Someone has figured that the heart, because of these rest periods, actually works only eight hours out of each 24.

In spite of its rest periods and great strength, this marvelous pumping muscle does get out of order. Some of its troubles come from the vein and artery pipes through which it must pump all those gallons of blood, and some come because its valves are faulty to start with or become faulty through disease.

There are 20 forms of heart disease. The three that account for about 90% of all cases are: 1. coronary heart disease, resulting from hardening and narrowing of the coronary arteries that carry blood to nourish the heart muscle itself; 2. hypertensive heart disease, resulting from high blood pressure, or hypertension as doctors call it; 3. rheumatic heart disease, which follows rheumatic fever, is a leading fatal disease among those aged five to 19, and affects some 1,000,000 Americans.

## Disease Outlook Hopeful

The causes of these three conditions are unknown. There is, however, hope that both causes and means to control the conditions will be discovered. For example, it is now known that prompt and efficient treatment of strep. sore throats with penicillin may prevent development of rheumatic fever. Children who come through one attack of this sickness can, in many cases, be protected from further, heart-damaging attacks by preventive treatment with penicillin or other modern streptococcus germ-fighting medicines.

Surgical procedures, from blue-baby operations to talcum powder operations, are saving many hearts. New drugs, new tools to diagnose and study heart and blood vessel diseases are being developed. Hearts are being saved and more will be saved as scientists learn more through research, such as that supported by the American Heart Association. This association hopes to get \$11,000,000 this year to further its heart-saving work.

You can help by giving, and you can help by learning these five facts:

1. Some forms of heart disease can be prevented. A few can be cured.
2. All heart cases can be cared for best if diagnosed early.
3. Almost every heart condition can be

helped by proper treatment.

4. Most heart patients can keep on working—often at the same job.
5. Your "symptoms" may or may not mean heart disease. Don't guess—don't worry. See your doctor and be sure.

When you do see your doctor, you will find that he will follow several procedures to check the state of your heart. First will be your history. Scarlet fever or rheumatic fever in childhood, for example, puts the doctor on guard for defects in the heart's valves, to be checked later in the examination.

By sight, touch, and hearing, the doctor will check the quality, rate and rhythm of pulse, the many sounds made by the closing of the heart's valves, and the state of the tiny blood vessels in the eye's retina, often clue to damage elsewhere in the arteries.

The familiar rubber cuff and mercury column instrument will tell of the blood pressure. The electrocardiograph, by means of electrodes attached to the body, picks up electrical impulses from the beating heart and gives pinpointed information about irregular heart beats and the exact location and extent of damage to the heart muscle following a heart attack.

The fluoroscope and X-ray picture show the doctor the shape of the heart, its position and signs of enlargement or other abnormalities.



**HEART CHECK**—Looking like a modern cupid, this young lady appears confident as well as fascinated as she awaits a heart check by her doctor.



**HEART MODEL**—To demonstrate how a heart works, doctors can use this teaching model of a heart.

Finally, or earlier in the examination, there may be laboratory tests of blood and urine and investigation of the condition of liver, lungs and kidneys, since heart trouble may often be accompanied by disorders of other parts of the blood circulation system.

Science News Letter, February 6, 1954

**GEOCHEMISTRY**

**Scientists Find How Mercury Ore Deposited**

➤ **EXACTLY HOW** nature deposits mercury ores has been discovered by two geologists at the University of California at Los Angeles. This promises to aid in discovering new sources of this strategic mineral.

Frank Dickson and Dr. George Tunnel have established that cinnabar, which is mercuric sulfide and the chief mineral source of mercury, is precipitated when solutions containing mercury sulfide and sodium sulfide are neutralized or diluted with water.

Evaporation actually increased the amount of dissolved cinnabar, although continued evaporation eventually precipitated the mercury. This was not in the form of cinnabar, however, but in that of an easily redissolved double salt.

This work is the first to definitely establish the precipitation curve of cinnabar at a fixed temperature. The study is one step in a series tracing the course of mercury compounds in naturally occurring solutions to their final ore deposit form.

Further improvements in the understanding of the origin of mercury deposits are expected to result from the combined field and laboratory studies of economic geologists and geochemists. The study is being performed under a contract with the Office of Naval Research.

Science News Letter, February 6, 1954

**CHEMISTRY**

**Largest Artificial Quartz Crystal Weighs 2 Pounds**

**See Front Cover**

➤ **THE LARGEST** man-made quartz crystal, shown on the cover of this week's SCIENCE NEWS LETTER, is unusually clear and weighs over two pounds.

The record-breaking crystal was grown by Brush Laboratories, Cleveland, Ohio, on a natural quartz seed plate less than one-twentieth its size, and took 78 days to reach its final dimensions.

Pure quartz crystals grown under exact conditions will, it is hoped, give even more perfect control of radio and TV circuits and astronomical clocks than scarce imported natural crystals.

Very fine natural quartz imported from Brazil furnishes the crystals now depended upon for high precision instruments.

The largest synthetic crystal was grown at 660° Fahrenheit, with the material compressed in an autoclave at a pressure of 5,000 pounds per square inch. Water containing 18% sodium carbonate (common washing soda) was the medium for growing the crystal.

Science News Letter, February 6, 1954

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