

# Do You Know?

In congestive *heart* failure, there is an increase in the volume of blood as well as in the amount of fluid in the spaces between the tissues and cells of many parts of the body.

In actual *flight* research dating back to 1950, U.S. scientists have shown that animals, and probably man, could survive flight into the outer reaches of the earth's atmosphere and into space itself.

*Minitrack* receives through eight antennas the signals from the low-power, lightweight transmitter in a satellite; by phase-comparison techniques, the angular position of the satellite as it passes through the antenna beam is measured.

The great declines in *salmon* runs in the Pacific Northwest have endangered more than a hundred canneries on the Pacific Coast.

PHYSICS

## Show Supersonic Waves Of Missile in Flight

See Front Cover

➤ A UNIQUE photograph has been produced showing a supersonic shock wave forming ahead of a guided missile in actual flight. The wave appeared immediately prior to the impact of the missile with the earth.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows a Chance Vought Regulus I missile in a terminal straight-down dive on a target. The wave built up ahead of the missile's nose and its angle indicates a supersonic speed of approximately Mach 1.1. Secondary expansion shock waves can be seen opposite and just behind the painted nose.

The photograph was made from a frame of a 35 mm. color movie film shot by the Sandia Corporation in California. It was made through a 60-inch f 5 reflective telescopic lens at a distance of one and one-half miles from the missile.

Science News Letter, December 21, 1957

TECHNOLOGY

## Power Ship by Free Piston Gas Turbine

➤ THE G. T. S. William Patterson is powered by the world's largest free piston gas turbine.

It is the fourth in a line of war-built Liberty ships to be selected for experimental conversion and engine replacement by the U. S. Maritime Administration. Driven by the 6,000-horsepower free piston engine, the Patterson is the first installation of this type of power plant in the United States.

Clarence G. Morse, chairman of the Federal Maritime Board and maritime administrator of the Department of Com-

merce, called the merchant ship an example of dynamic research. In trial runs in Chesapeake Bay and the Atlantic Ocean, the Patterson achieved a speed in excess of 17 knots under optimum conditions.

The Maritime Administration decided to experiment with the installation of a free piston gas turbine after determining that the engine has potential in mobilization planning since it requires a minimum of

critical materials. Manufacture of this unit can be adapted to mass production techniques.

Studies made to date indicate the overall thermal efficiency of the free piston engine will be high. The new engine was built by the Cleveland diesel engine division of General Motors, and the ship was converted by the Bethlehem Steel Company.

Science News Letter, December 21, 1957

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