AERONAUTICS

Ram Jet, Navy's Newest

This light-weight open pipe engine has just been revealed to the public. It may be used to power planes and weapons at 1500 miles per hour.

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➤ HURLING AIRPLANES or guided missiles through space at twice the speed of sound, a "flying stovepipe" that burns oxygen from the air as it flies may propel the high-speed aircraft of the future or power the weapons of another war.

Ram jet, as the light weight, open-pipe engine is called, was revealed to the public for the first time by Vice Adm. George F. Hussey, Jr., chief of the Navy's Bureau of Ordnance, and Dr. Richard Roberts, supervisor of the ram jet project at the Applied Physics Laboratory of Johns Hopkins University, Silver Spring, Md., who appeared as guests of Watson Davis, Director of Science Service, on Adventures in Science heard over the Columbia network.

With no moving parts and no precision machinery ram jet is essentially a pipe with a small opening at the front and open at the rear, Dr. Roberts said.

"Air is scooped in and compressed by its own speed; fuel is injected and burned; the exhaust streams out the rear providing a thrust like a rocket motor," he explained.

The impulse produced by the escaping hot gases shoots the 70-pound jet through the air at speeds between 800 and 1,500 miles per hour, but high speeds must be reached before ram jet can operate. Ram jets have to be launched and brought to high speeds by catapults or separate booster rockets to operate the "flying stovepipe."

Though ram jet was developed in the late stages of World War II to power guided missiles against such weapons as the German V-bombs and Japanese suicide planes, Admiral Hussey declared, "It is also possible that ram jets will be attached to the wings of planes to allow them to cruise at supersonic speeds."

Dr. Roberts said that conventional engines and propellers are still best for low speed flying, while a turbo-jet engine is more efficient as the speed increases. When the speed goes above that of sound waves, about 750 miles per hour, ram jet, with a "convenient cruising speed" of 1,500 miles per hour, is superior.

While the theory of ram jet propulsion was first expounded in 1913 by a Frenchman named Lorin, the preliminary work that led to successful experiments was started in the summer of 1944 by the Applied Physics Laboratory of Johns Hopkins University where the famous proximity fuze was developed during the war.

First actual tests of ram jet were made June 13, 1945, at Island Beach, New Jersey, and fishermen nearby joined the scientists as witnesses to the first flight of the new engine. More successful than counted on, the first tests sent jets out over the Atlantic Ocean, and one landed 50 feet from a fishing boat off the New Jersey coast.

As propulsion units for guided missiles, the ram jet has the advantages of being light and cheap. The first tests were made using the exhaust pipe of a Thunderbolt plane with the modified part developing more power as ram jet than could the plane.

Science News Letter, June 15, 1946

PHYSICS

Synthetic Oil Lubricates In Hot or Cold Weather

➤ SYNTHETIC SILICONE OILS, made by juggling molecules of sand, coal, oil and brine, lubricate effectively aircraft instruments at sub-zero temperatures, Westinghouse tests demonstrate. They also protect ball and needle bearings against corrosion in tropical climates.

These new oils perform well in changes from hot to cold weather conditions, as they will not evaporate in extreme heat and will flow freely in extreme cold.

In the tests temperatures were lowered to 85 degrees below zero Fahrenheit, and raised to the temperature of vapor from boiling water.

The silicones are American-developed synthetic resins made of sand and organic compounds. Both silicone oils and silicone greases are made, as well as many other products with many uses.

Science News Letter, June 15, 1946

FLYING STOVEPIPE—Successful working models of the Navy's revolutionary ram jet, a means of propulsion for flight at supersonic speeds up to 1500 miles per hour.

ASTRONOMY

New Molecular Bands On Jupiter and Venus

➤ HITHERTO UNKNOWN molecular bands of carbon dioxide around Venus, planet nearest to the earth, and of ammonia around Jupiter, largest of the planets, have been photographed at McDonald Observatory, Fort Davis, by use of a new infrared spectrograph.

Light of wave lengths of the order of one micron are photographed with the spectrograph, explained Dr. Otto Struve, director of the observatory owned by the University of Texas and operated jointly with the University of Chicago. This invisible form of infrared radiation is focused by means of a mirror and a grating plated with a thin coating of gold.

Actual observations of the molecular bands were made at McDonald Observatory by two University of Chicago staff members, Prof. G. Herzberg, authority on the structure of molecules, and Dr. W. A. Hiltner, assistant director of the Yerkes and McDonald Observatories.

Studies with the infrared spectograph may disclose other information about the little-known atmosphere of neighboring planets. Researches at McDonald Observatory will be extended to still longer wave lengths of invisible light.

Science News Letter, June 15, 1946