



AFTER BURNER—Fuel enters the after burner attached to the tail exhaust pipe of the jet engine, somewhat as shown in the artist's drawing, where its combustion adds about one-third increased thrust to the otherwise 1,000-mile-per-hour discharge.

ENGINEERING

After Burner Adds More Thrust to Jet Engine

► **EMERGENCY SPURTS** of speeds of jet-propelled combat planes will result from a development of the Ryan Aeronautical Company which the makers call an "after burner." It is a type of a ram-jet engine attached, as an integral part, to the after end of the jet engine. It will be used when needed by the flip of a switch.

The combination might be described as a ram-jet attached to a turbo-jet power plant. The turbo-jet develops the high-pressure gases that give thrust to the plane and also operates the compressor that gathers in the air whose oxygen is needed for combustion.

The ram-jet effect is obtained by spraying fuel into the special tailpipe where its burning adds mass and velocity to the speeding gases of the jet stream. It burns because there is a plentiful supply of unburned oxygen in the jet stream from the turbo-jet.

Ryan officials claim that this is the first device of the sort specifically designed for regular use in flight. It can also be used in take-off. The added thrust, with jet planes already flying at more than 600 miles an hour, may assist a plane in breaking through the so-called air compressibility barrier encountered as planes approach the speed of sound. The device adds more than one-third to the power plant's normal propulsion thrust.

The development and testing of the device has now about reached the end of

ground-test stages. The tests were made in fixed engine stands on the earth. In them the stainless steel combustion chamber of the after burner becomes a roaring blast furnace shooting out a colorless, searing jet stream, revealed only by heat waves, at over 1,000 miles an hour.

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ANTHROPOLOGY

Peruvian Village Shows Culture Centuries Old

► **A SMALL** village on the coast of Peru, Smithsonian Institution scientists found, is a living museum of ways of life nearly 1,000 years ago and also the nursery in which a new culture can be seen in the process of developing.

Moche is located on the new Pan American paved highway only about 15 minutes' drive from the large modern city of Trujillo. But despite its lack of geographical isolation, the people up to now have kept themselves comparatively remote from modern influences so that life there still goes on in much the same old combination of Spanish and Indian ways.

The new road may be expected to make a difference.

The Moche culture is much older than the Spanish Conquest. They had the largest single adobe structure in the world and extremely realistic pottery designs. Evidence has been found of considerable agricultural development, including irrigation ditches.

Present residents of the village are direct descendants of these ancient people. They have lost their old language and

now speak more or less the same Spanish that is the language of other parts of Peru. But physically the ancient type persists.

Moche is a long way—five or six hundred miles—from Cuzco, famous center of Inca remains. But it is only a few miles from another center of archaeological interest, Chanchan, one of the most extensive sites of ancient culture.

The village was studied for the Smithsonian Institution by John Gillin, now of the University of North Carolina, who describes in detail his findings in a new report of the Institute of Social Anthropology.

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EDUCATION

Texts Behind Children In the Use of New Words

► **SCHOOL** books intended to build the vocabulary of children are 'way behind the children themselves in use of new words.

Editors of school "readers" don't realize that children read newspapers and magazines as well as many books, Dr. Robert H. Seashore, psychologist at Northwestern University, commented in discussing results of a study made in his department.

The average child adds 5,000 new words to his vocabulary every year, it was found. The average textbook of reading introduces only 500 new words in the same time. A child in first grade already knows about 16,000 basic words plus others derived from them, including some not in abridged dictionaries, the study revealed.

Vocabularies of both children and adults have been greatly underestimated because of faulty methods of measurement and misinterpretation. Those tested were not given a chance to show all that they know, Dr. Seashore indicated.

Counts of all the different words used by great writers show that Milton used only 11,000; Shakespeare, 16,000 and Victor Hugo, 20,000. From this people reasoned that if Shakespeare used only 16,000 words, then our own everyday vocabulary must be much smaller. Actually, we have no estimate of how many words Shakespeare considered in writing his works, Dr. Seashore said.

It is an interesting coincidence that in Shakespeare's works which are known and loved by so many people, he used exactly the number of words included in the average first grader's vocabulary.

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