

AERONAUTICS

Postwar Jet Engines

Jet propulsion of civilian aircraft depends upon designers' ability to produce a plane of lower drag to offset the high fuel consumption.

► JET propulsion of commercial aircraft in future is dependent upon aircraft designers and their ability to produce a plane of lower drag to offset the high fuel consumption of the thermal jet engine, declared Dr. M. J. Zucrow of the Aerojet Engineering Corporation at a meeting of the Aviation War Conference of the American Society of Mechanical Engineers in Los Angeles. Dr. Zucrow discussed both thermal jet engines and rocket motors.

"At present, because of high fuel consumption, the application of the thermal jet engine appears to be restricted to short-endurance military craft," he said.

"Until more of the operating data and actual performance characteristics of aircraft equipped with this form of power plant become available, the possibilities of applying thermal jet propulsion to civilian aircraft cannot be expressed with certainty."

The speaker recognized that jet propulsion provides greater flight speeds than the conventional engine-driven propeller systems.

"Perhaps the most attractive feature of the thermal jet engine, apart from its ability to provide propulsion at high speeds, is its simplicity and low weight," he continued. "Furthermore, this power

plant is relatively free from vibration, permits using cheaper fuels than high-octane gasoline, and should require less frequent major overhauls."

Many problems are presented by the high operating temperatures required to obtain even fair fuel economy, he said, and there are still metallurgical problems to be solved. The fact that thermal jet propulsion has become a practical reality is an indication, he added, that great progress has already been made.

The principal application of rockets to aircraft in the United States, he explained, is in the field of assisted take-off. Most of the applications of rocket motor units have been to flying boats, although such units have been successfully used with carrier- and land-based planes. Two types of units are employed, some using liquid and some solid propellants. The solid-propellant units have found the greatest favor, according to Dr. Zucrow.

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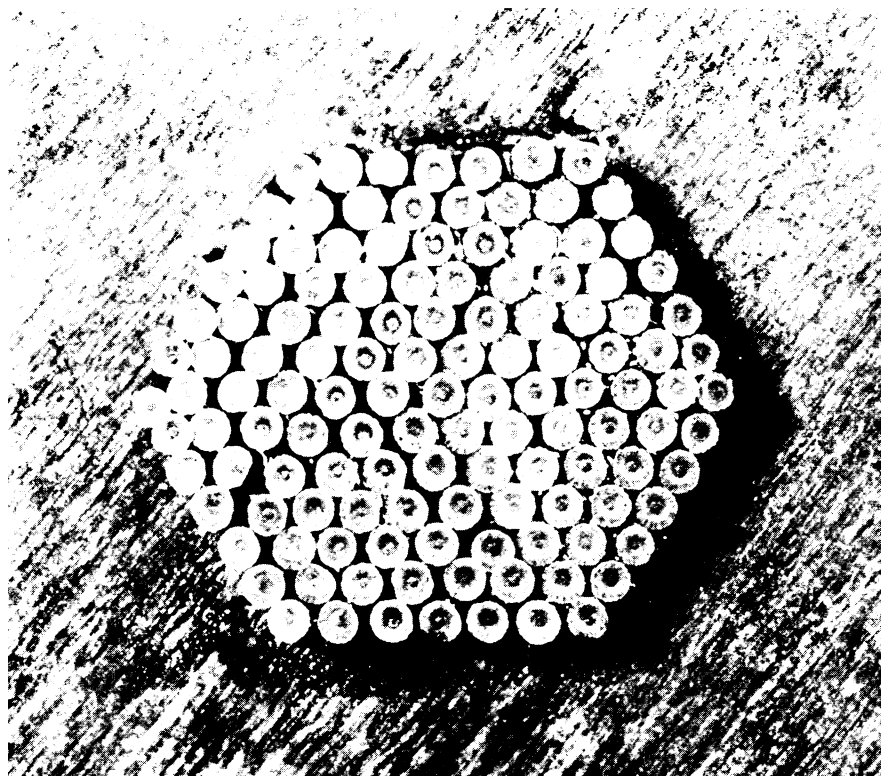
Many Postwar Uses for New Organic Cements

► HUNDREDS of postwar uses for a bonding cement, now playing an important role in war equipment, are suggested, from holding metal plates together without rivets or welds, to replacing needles and thread in the garment-making industry. It is a new synthetic cement developed in the laboratories of the Goodyear Tire and Rubber Company, and can be used to bond wood, plastics, rubber, fabrics, and metals together in any combination.

This cement, called Pliobond, forms a bond that is flexible, waterproof and possessed of high tensile strength. It retains these characteristics at temperatures ranging from 70 degrees below zero Fahrenheit to 140 degrees above. It is easily applied and adheres at once to any clean, dry surface.

A bonding agent with similar properties has been developed also by the B. F. Goodrich Company. It is a new rubber cement, called Plastilock, which is a nonthermoplastic, water and aromatic oil-resistant adhesive for bonding metals, wood, plastics and ceramic material to themselves or to each other. In use, better results follow when it is applied with heat and pressure. The purpose of the pressure is to obtain good surface contact. In an attempt to pull apart aluminum and wood held together with this material, the bond proved stronger than the wood itself.

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MATHEMATICAL INSTINCT—It is interesting to note that this cluster of eggs of the Wheel-bug has been arranged by the insect into a definite design with mathematical precision. Each egg is individually glued in place and covered with a water-proof substance. These clusters of eggs are usually found on the bark of trees. The Wheel-bug, like many other insects, seems to have the instinct of arranging its cluster of eggs into a hexagonal design. Photograph by George A. Smith of Quarryville, Pennsylvania.