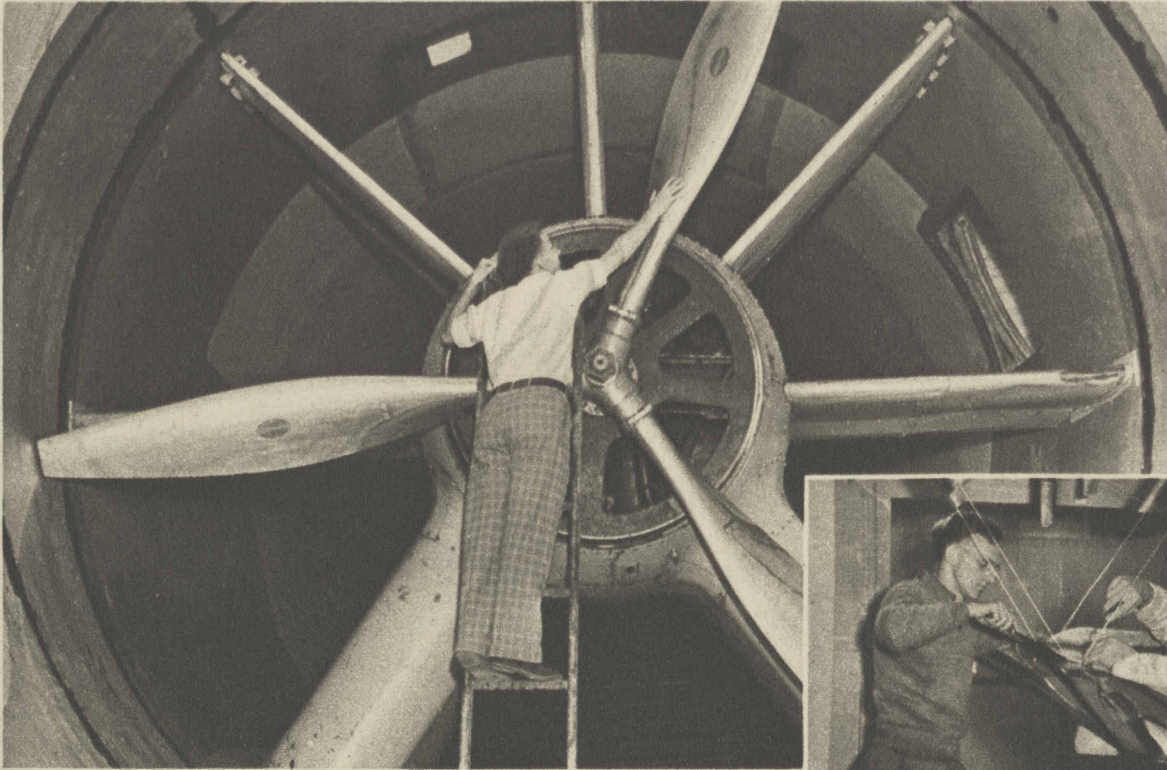


Man-Made Gales Speed Aviation Progress



California Institute of Technology 750-horsepower 15-foot propeller which produces a 200-mile wind for the school's air tunnel.

Wind Tunnels Industry's Best Laboratories

By WAYNE THOMIS

TUCKED AWAY in quiet hamlets in most of the world's larger nations are corps of keen-minded young engineers who are engaged in what today is recognized as the most important if the least spectacular work in the new science of aviation.

These young men, most of them, are not flyers at all. They are students, cloistered laboratory searchers for new knowledge. And the instrument they

use to conduct their experiments is the wind tunnel in one or another of its various forms.

What, you may ask, is a wind tunnel?

Its name is itself quite an accurate description of a wind tunnel. Basically it is a tube or tunnel through which air can be forced under almost any conditions of density, humidity, direction, and velocity that its operators desire.

It is a device to create condi-

tions of flight around a stationary object. The purpose is to allow study of the object—a model of an entire plane, or merely a wing, a tail group, or an engine nacelle—under "ideal" conditions. Instead of forcing the object of study through still air at flying speeds—as happens in actual flight—the laboratory crews force air past the object, which remains still.

The Wright brothers—the immortals who first achieved the goal of flying in a power-driven, self-contained airplane—invented the first wind tunnel in 1901 in their Dayton, O., bicycle shop. They were hunting for some sure method of measuring "lift and drift" of model wing sections they were planning to use the next summer in their glider experiments, and they hit upon this plan as the only feasible one. At the time they hardly realized the importance of their achievement, for they were most concerned with the results obtained in their tunnel.

These results gave them the first accurate tables of lift and drift for wing sections and were directly responsible for the efficiency of their airplane. In fact, many scientists insist the brothers would not have been able to fly had they not obtained their tables.

Whether these claims are true or not, the wind tunnel has come

to be the source of most of the information that has allowed aviation to take such tremendous forward strides during the thirty-five years of its existence. And technical progress of the future—and there is no reason to suppose that the speed at which this progress is being made will be reduced—will be directly traceable to wind tunnel laboratories.

The most famous wind tunnels in the world are at Langley field, Virginia, site of the laboratories of the National Advisory Committee for Aeronautics. Out of

active tables of performance for certain exact forms and shapes of airplane parts—was made there.

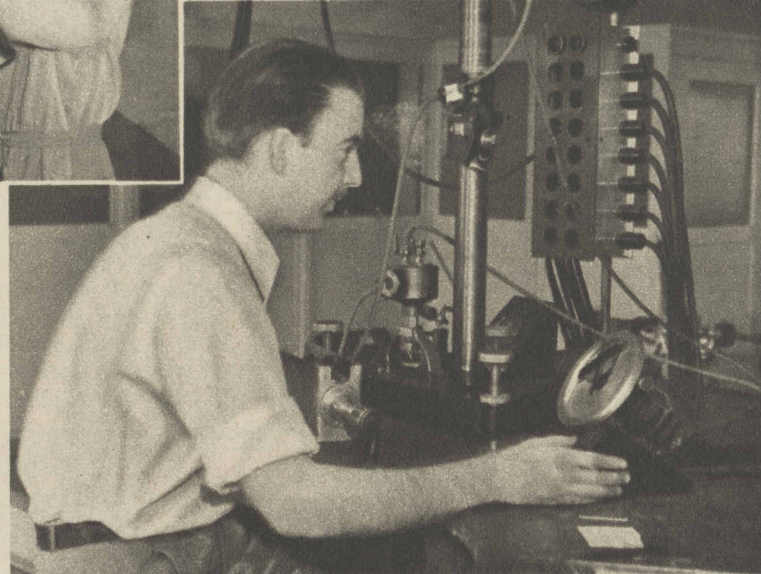
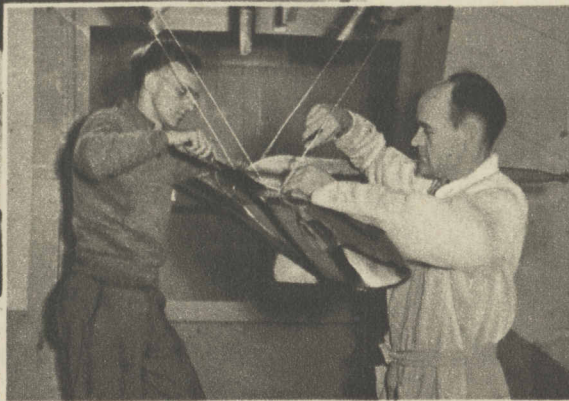
There is every reason to believe that the preeminence of American aviation in the world today can be directly connected to the work done at Langley field.

There are other wind tunnels in the United States. The army air corps' experimental engineering station at Wright field has two. The navy has several small tunnels at various shore stations, and several universities in this country have tunnels. One of the best is at the California Institute of Technology at Pasadena, Cal.

This tunnel has a ten-foot diameter and is equipped to create

At left Instructor and student adjust a highly polished wing model.

(Acme photos.)



Wind tunnel operating station from which wind velocity and actions of tested models are controlled.

these tunnels in the last ten years have come the purely scientific experiments that have been used by aeronautical engineers the world over in constructing the modern high-speed, high efficiency airplane, whether military or civil.

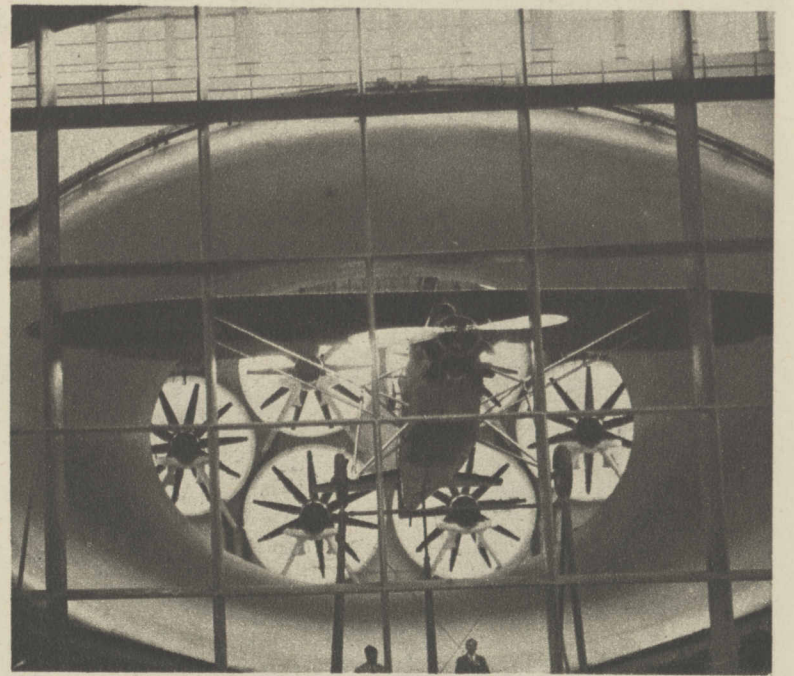
The efficiency of certain wing sections, of engine nacelles, of retractable landing gear, of tail surfaces, of countersunk welding, of pusher versus tractor propulsion, of propeller blades, of slots and flaps and other high-lift devices, of placing of engines in relation to wings and fuselages—all these matters have been the subject of laboratory experiments at the N. A. C. A. tunnels. And these reports have become the bibles of most of the world's designers and manufacturers.

In fact, the first large-scale scientific approach to aviation—the collection, that is, of compar-

A glass window in the side of the ten-foot tunnel enables this student to watch the action of a model inside the apparatus.

a 200-mile-an-hour blast. Among accompanying illustrations are views of this Caltech tunnel. This laboratory has been used by most of the airplane manufacturers of the west coast, including Douglas, Lockheed, Northrop, Vultee, and Consolidated.

It was in the Caltech tunnel that the now famous Douglas commercial series, the DC-1, DC-2, DC-3, and DC-4 airplanes, were tested before actual con-



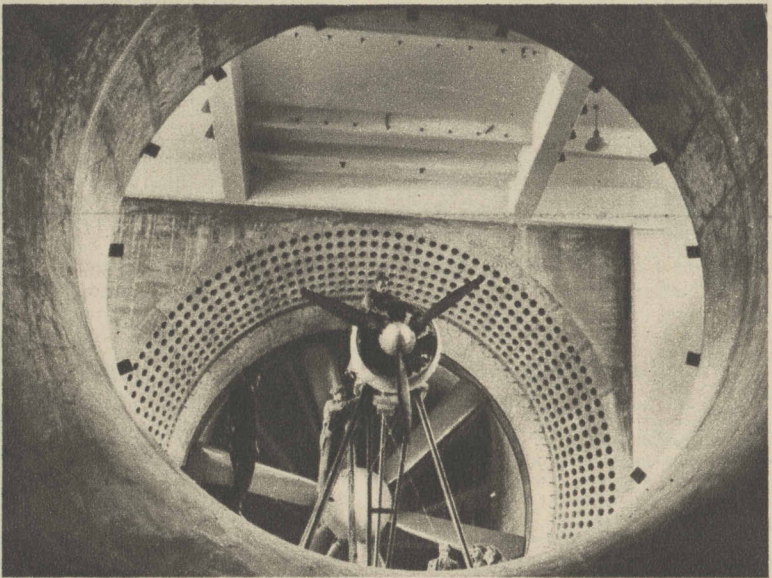
A full-sized plane as seen through the intake openings of the French air ministry tunnel near Paris. Six instead of one large propeller produce a wind in excess of 100 miles an hour.

struction was commenced. The stability, maneuverability, speed, balance, and general flight characteristics of these big machines were all pretty well determined in the wind tunnel before any other phases in their engineering were considered.

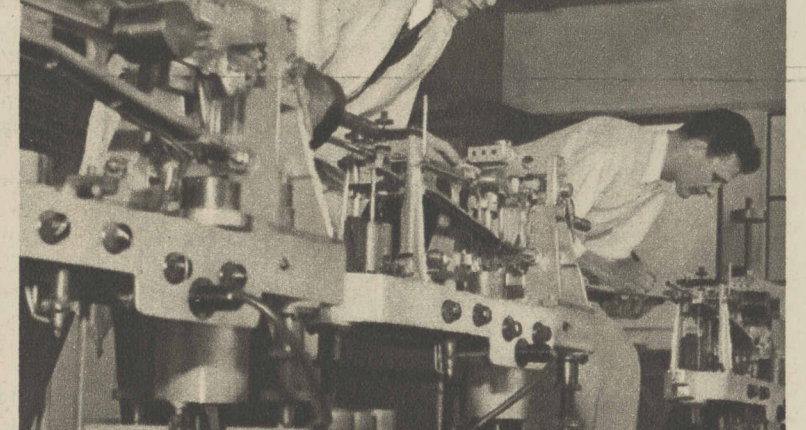
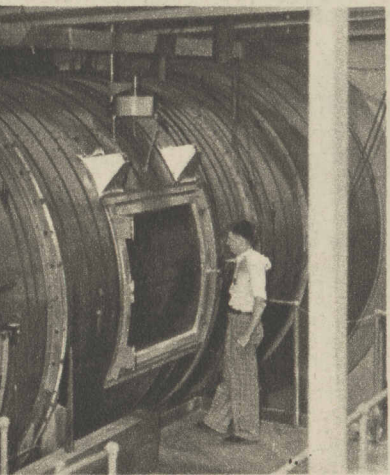
One of the best-equipped wind tunnel laboratories in the world is owned by the German government. England put into action

less than a year ago a new twenty-foot high-speed tunnel at the Royal aircraft establishment at Farnborough. The French have had a full-scale tunnel in operation at Chalais-Meudon for four years. In this tunnel six 750-h.p. engines create an air stream of 106 miles an hour for an oval aperture with 100 square yards of available area. Actual airplanes with wing spreads up to approximately 50 feet can be placed in this tunnel for flight testing.

American airplane manufacturers welcome the world-wide investigation of aerodynamics, but they fear that the American lead in aviation may pass to another country unless our own facilities for research are rapidly expanded and the work systematized.



An airplane motor being made ready for tests in England's new Royal Air force wind tunnel, which can accommodate a plane with 56-foot span.



Students taking readings of loads on models in the wind tunnel as registered on balances outside the tube.

THE AUGUST BLUES

By W. E. Hill

Copyright, 1938, by Chicago Tribune-N.Y. News Syndicate, Inc.



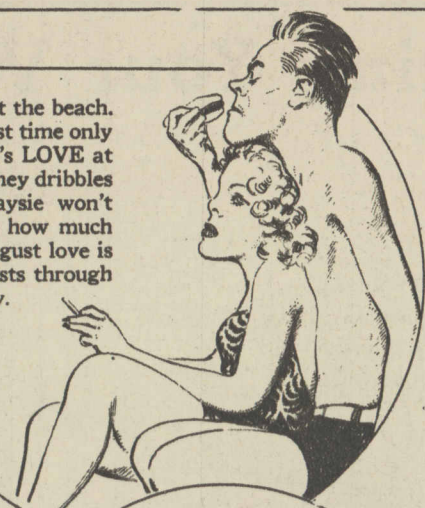
Sidney and Saysie at the beach. They met for the first time only this morning, but it's LOVE at first sight and if Sidney dribbles mustard on her, Saysie won't mind a bit. Shows how much she really cares. August love is hot but it seldom lasts through Labor Day.

Trouble-maker on the sidelines at the amateur ball game. Loves a good fight among the players and eggs them on when there's a chance.

7-31



The August croquet game with the ruffled tempers and the cruel insinuations that maybe Cousin Florence's ball was helped through the wicket by a little shove.



Nellie, the beautiful cloak model, poses in Winter furs for the Fall advertising folders on a much-too-hot August day.

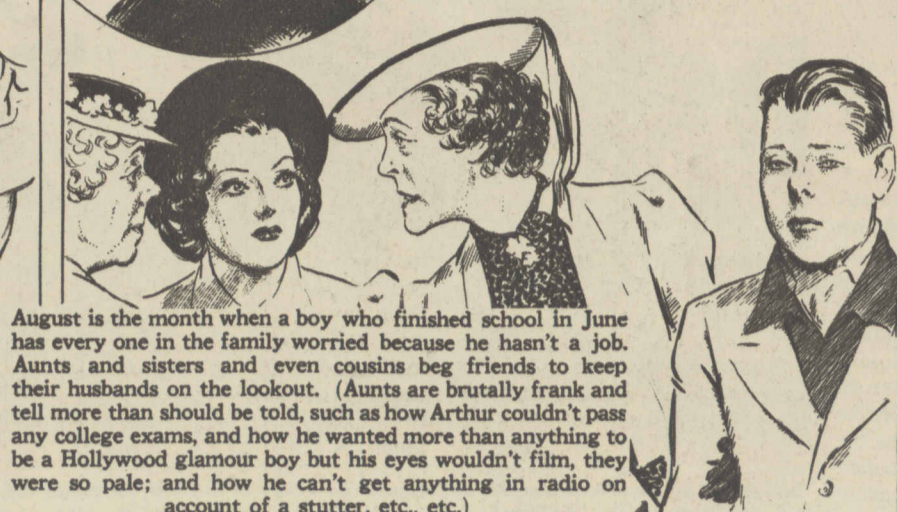


The August flea hunt. Rover doesn't like it much.



The August tennis tournament opens with a big bang. (These are two of the not-so-good entrants who will be got rid of early. They're the kind who do a lot of heavy leaping, tense crouching at the net, and a lot of mock cringing after a faulty service.)

The country ball teams have their arguments just like the professionals. (A man at bat was hit by the pitcher's curved ball, and the rival team said, "He done it on purpose." Then when the catcher stepped on some one's glasses, again it was said, "He done it on purpose," and there were wrongs to be righted, faces to be socked, and harsh words bandied about.)



August is the month when a boy who finished school in June has every one in the family worried because he hasn't a job. Aunts and sisters and even cousins beg friends to keep their husbands on the lookout. (Aunts are brutally frank and tell more than should be told, such as how Arthur couldn't pass any college exams, and how he wanted more than anything to be a Hollywood glamour boy but his eyes wouldn't film, they were so pale; and how he can't get anything in radio on account of a stutter, etc., etc.)