AVIATION

Higher Speeds for Airplanes And Greater Safety Foreseen

New Shape for Seaplane Floats, Rearrangement of Wings And Fuselage, Air Cooling Among New Developments

STILL greater airplane speeds and added safety and economy for private, transport and military planes are foreseen as the result of research conducted during the past year at Langley Field, Va., by the National Advisory Committee for Aeronautics.

In the past four years, as a direct result of NACA research applied by manufacturers, airplanes have had their speeds boosted by 75 miles per hour with no increased power required. Now airplane designers and manufacturers making their annual visit to the NACA laboratories here learned of new researches that seem likely to give another spurt to improved airplane design.

Some of the possibilities are:

New methods of lateral control, replacing ailerons, which have been standard for 25 years, will greatly accelerate the use of airplanes by private pilots. The most promising are flaps called spoilers which when raised lengthwise above the wings by the pulling of a lever will allow shorter take-offs and shorter safe landings by relatively unskilled fliers.

Through the simple device of making one seemingly insignificant part of a seaplane float pointed instead of square, flying boats carrying fifty passengers across the Atlantic are foreseen. The new float proved its worth in the NACA world's largest towing basin, at Langley Field, Va.

Autogiros are capable of flying two hundred miles per hour, wind tunnel tests show, whereas last year it was generally agreed that this "vertical windmill' type of aircraft, radically different from the airplane, would be useful only for slow speeds.

50 Miles an Hour

The speed of airplanes, already increased 75 miles an hour by NACA research upon better engine location and reduced air resistance of engines, will soon be increased another 50 miles per hour. This is promised by refined design of the way wings and fuselage are arranged. This means that transports cruising at 250 instead of 200 miles per hour will be possible in the next few years.

Suction Increases Lift

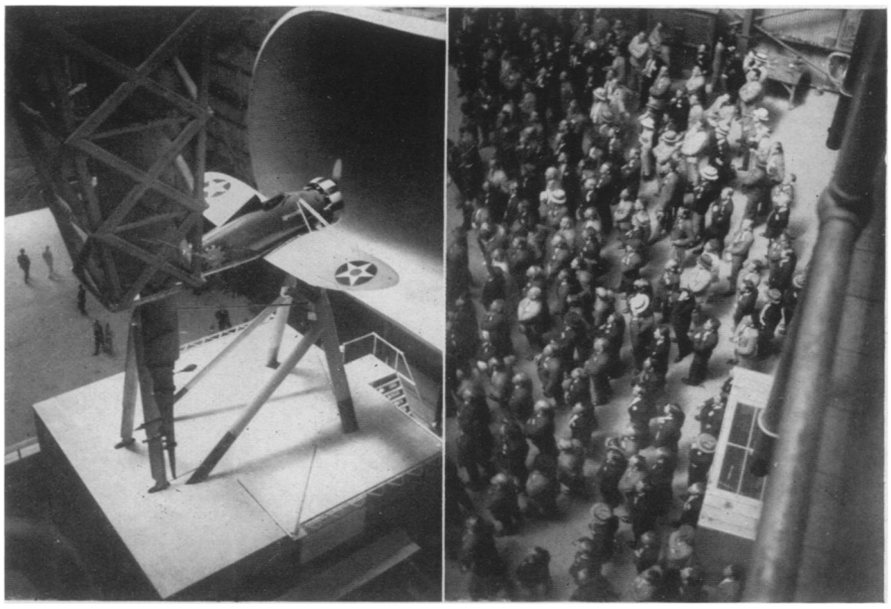
Air sucked in at the tops of airplane wings through slots will probably be used to increase the lifting power of the wings at low speeds without increasing air resistance. The effectiveness of putting suction fans into the wings was demonstrated by NACA engineers, who flowed streams of smoke around a model. Use of a few per cent. of the power of the engine in this way will allow the control of the thin "boundary layer" of air over the top surface of the airplane's wing, and increase the lifting power 150 per cent. This will greatly aid in the take-off and the landing, allowing planes to get off the ground more quickly with heavier loads, and then get down safely over high obstructions into smaller landing fields.

More power from aeronautical engines without increased size and probably reduced fuel consumption is a future development. This will come through the use of forced air cooling by blowers, injection directly to the cylinders of safety fuel that will not detonate violently or "knock," and use of two-cycle engines. It was predicted that the next big advance in aviation would be in engine improvement.

Fuel economy is foreseen as a result of an NACA spark-ignition test engine in which safety fuel is injected directly into the combustion cylinder. In ordinary engines, gasoline is mixed with air in a carburetor. This new engine, when cooled by forced air draft, runs on only about four-tenths (0.41) of a pound of fuel per horsepower hour compared with five- or six-tenths of a pound in the case of typical gasoline aviation engines now used. This approaches the fuel economy of the diesel engine (about .36 pounds per horsepower hour) and NACA engineers consider it possible that a new safety fuel injection engine can be developed that will make unnecessary the further development of diesel aviation engines.

Avoid Flutter

Violent vibration of airplane parts, called "flutter," has been explained mathematically by Dr. T. Theodorsen of the NACA staff. Sometimes flutter has wrenched airplanes to pieces in midair, destroying their wings or tail



THE SKY BROUGHT TO EARTH

The crowd of scientists and avaitors is watching a demonstration of the giant wind tunnel at the Langley Field laboratory of the National Advisory Committee for Aeronautics. A full-size Army airpane is being tested, the winds of heaven being simulated by an enormous draft of air from the mouth of the tunnel, which is 30 feet high by 60 feet long. The impressive apparatus at the left is a pistol tube for measuring pressures and determining the air speeds.

surfaces. Now designers using Dr. Theodorsen's formulae can be sure that flutter will not occur in any airplane part that they intend to build.

The National Advisory Committee for Aeronautics is an independent agency of the federal government charged with undertaking research for the aid of all aeronautical activities, military and commercial. Present at the recent meeting were Orville Wright and Col. Charles A. Lindbergh, who are among the members of the committee. Dr. Joseph S. Ames, president of the Johns Hopkins University, is chairman, and Dr. G. W. Lewis is director of research.

Science News Letter, June 2, 1934

ENGINEERING

Five Great Bridges Building; Funds From RFC and PWA

FIVE new bridges of major importance will span the waters of American rivers and bays to a total length of over 17 miles, shortening highway distances between important cities, and eliminating in each locality waste of time involved in ferry crossings.

RFC and PWA money to the extent of $130,000,000 is being used in financing projects now under construction or on which work will be started in the near future.

San Francisco Bay alone is getting some $117,000,000 worth of engineering attention. The huge Golden Gate span will bring to California by a margin of 700 feet the coveted distinction, now held by the George Washington Bridge over the Hudson River, of being the longest suspension bridge in the world. The seven-mile-long San Francisco-Oakland Bridge also will be the largest of its type.

A $13,000,000 cantilever-type bridge is being flung across the Mississippi river at New Orleans. Although less spectacular than the others from the standpoint of size, it presents many engineering difficulties because of its location in a region of sudden, heavy floods and oozy river bottom which make it difficult to get a foothold for the massive piers which have to support its great weight.

Another cantilever is contemplated which will carry a highway four miles over the swift tides in the Columbia river between Washington and Oregon at Astoria. The PWA is at present considering a loan of over $6,000,000 necessary for its construction.

Bridging Narragansett Bay to give Newport, R. I., easier access to New York City has for a long time been contemplated by engineers. The War Department has recently approved a plan which will in part fulfill this scheme and assistance is hoped for soon from the PWA.

The $30,000,000 bridge across the entrance of the harbor of Sidney, Australia, was for a brief interval the greatest feat of its time.

The Golden Gate project as it was at first contemplated called for a steel arch structure of the same type, but according to the Engineering Office of the War Department, these first plans were rejected, one of the reasons being the problem of its destruction in wartime.

It was feared that a steel arch because of its greater bulk might bottle up the entrance to San Francisco Bay if enemy shell-fire broke away the supports. The present cable suspension would be harder to destroy and in the event that it did crash would settle along the bottom, leaving water enough for even the largest ships to pass over.

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ARCHAEOLOGY

Jade Pendant Clue to Child Sacrifice Long Ago

A BEAUTIFUL carved head of jade found at the neck of a little child buried in San Jose, in British Honduras, is regarded by archaeologists as evidence of child sacrifice among the Mayas many centuries ago.

The jade head, a treasure so rare that not even Mayan chiefs of San Jose were adorned with anything of the sort, is a clue that the child was no ordinary little Indian. The burial was found by J. Eric Thompson, archaeologist of the Field Museum of Natural History, who has just returned from British Honduras. He conducted a joint expedition with the Carnegie Institution of Washington.

The child decked in a rare ceremonial jewel is not the only sign found by the expedition that the Mayas sacrificed children to the gods. A large number of child burials indicate to the archaeologists that the Mayas, like the Aztecs and some of the Indians of the Andes, offered children to the gods hoping to receive the favor of abundant rain.

The expedition found new and definite proof that the Old Empire of the Mayan Indians, in and around the region of San Jose, was not abandoned in a great mysterious wave of migration northward to Yucatan, as some archaeologists have thought. This supposed wholesale desertion of the great cities, 1100 years ago, is refuted by the discovery that San Jose was occupied continuously from the time of Christ or earlier down to about the fifteenth century.

Mr. Thompson has found traces of five periods of occupation at San Jose. Copper, the first ever found in place where the Mayas left it in the Old Empire country, is one discovery of importance. This metal belongs to the last period of San Jose's history, just before the discovery of America. A bit of cloth smaller than a dime is another valued bit of evidence, for the damp climate of the region does not ordinarily preserve cloth.

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ASTRONOMY

Supposed Tenth Satellite Of Jupiter Only Asteroid

JUPITER'S supposed tenth moon has turned out to be only an asteroid or minor planet, one of hundreds of such small objects that circle in the heavens between the orbits of Mars and Jupiter.

The Harvard College Observatory, American clearing house for astronomical information, has received a telegram from the first observer of the deceptive pinpoint of light, Dr. H. M. Jeffers, of Lick Observatory, Calif., stating that further observations, as well as an orbit calculated by himself and his associate, A. B. Wyse, make it practically certain that the object is an asteroid.

The addition of a possible tenth member to Jupiter's large family of moons was announced after scanning of photographs made on May 9 showed a minute fleck of light near the eighth satellite and having the same apparent motion. At the same time, however, the cautionary statement was made that the tiny celestial stranger might turn out to be an asteroid, as has proved to be the case.

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