

AERONAUTICS

U. S. Air Center Speeds Research

Nation's Biggest Aeronautical Laboratory Must Usher 4,000 Planes into Air Corps

By LEONARD H. ENGEL

THE BIGGEST aeronautical laboratory in the United States is getting set today for the greatest test job in the history of American aviation—ushering 4,000 warbirds into the Air Corps as Uncle Sam prepares the mightiest Army air fleet he has ever had.

Even as War Department officials work without furlough, and Sundays and evenings too, to speed orders to factories all over the country, there's an atmosphere of bustle and hurry-up at Wright Field, the Army's \$10,000,000 experimental plant on the outskirts of Dayton, O.

There it is that the new winged guardians of the nation must meet the acid test: will they work? From mightiest four-motored flying fortress down to tiniest fighter, they have all gone through the mill at the mile-square flying field near the birthplace of the brothers after whom the field is named. And every one of the newest will "get the works" there, too—450-mile-an-hour pursuit, 400-mile-an-hour attack bomber, and rocket-like interceptor.

Work Speeded

Contracts and specifications for the new planes are being drawn up there and in Washington before money for their purchase is actually available, so that not a moment will be lost. Engineers at Wright Field are figuring their routines closely to get more results in less time. Engine test stands are being enlarged to try out more and bigger motors for the 450-mile-an-hour pursuit plane now here and the 500-mile-an-hour fighter which will be going into service toward the end of the air armament program. Wright Field is beginning to beat with the quickest pulse in the 12 years it has served as headquarters for the Materiel Division, that section of the Air Corps charged with securing, testing and maintaining everything an air force needs from airplanes and airports down to the pilot's goggles.

An Army plane has a long history behind it by the time it reaches the hands of the combat flyer, and much of that history has happened in and around

the Dayton test plant. Like as not, it is a Wright Field engineer who draws up the specifications the manufacturer competing for a contract must fulfill. It is certainly in one of the rooms off the long corridor in the administration building that a crisp officer opens and reads aloud sealed bids citing how much the new craft, perhaps at that moment resting outside on the flying line, will cost the government. And during the months following the opening of the bids, an Army board of merit pries into its most intimate secrets: taking it apart, peering at the metals of which it is made; putting it together again, flying it to see whether it really does that 400 miles an hour the manufacturer claimed.

Guard Buildings

Fifty buildings, whose interiors are closely guarded from spying eyes, house the 1650 officers and civilian employees who make up the Wright Field staff of the Materiel Division, whose activities are in the national spotlight as a result of the expansion program. At any time, there are likely to be as many as 100 planes of nearly as many types, in various stages of disassembly, in the three long hangars converging on the roomy

concrete apron. Half a dozen crack flyers, Army test pilots, are on hand to carry out hours of patient flying, under the command of veteran Maj. Stanley Umstead, an artist at the scientifically precise flight required of an aviator who must prove or disprove planes. Over all is a quietly forceful 53-year-old brigadier general, George C. Brett, who has just been assigned the command and moves in at a time when the heat is on as it has never been before.

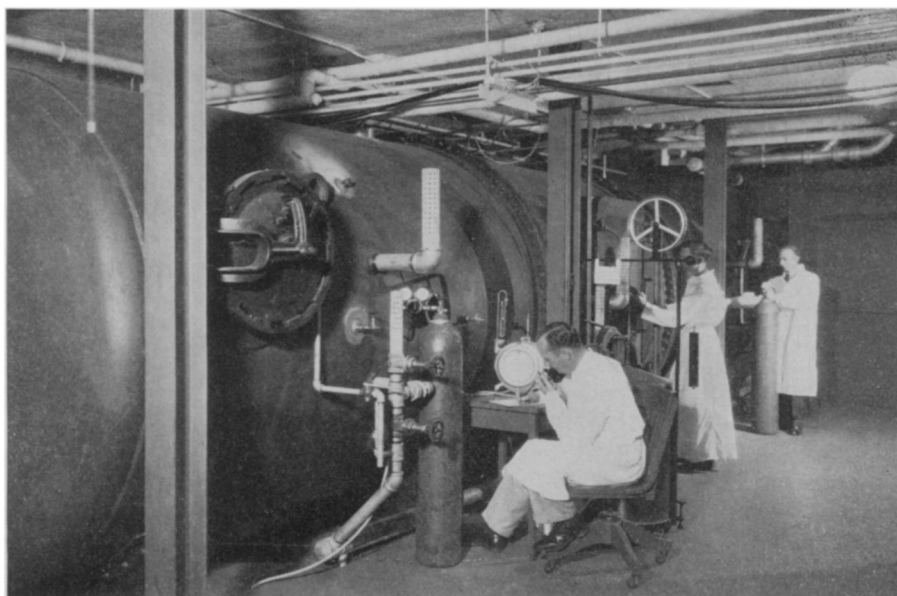
The story of the birth and infancy of an Army plane is perhaps best summarized in the organization of the technicians and equipment under Gen. Brett. Most important of the Wright Field sections is the engineering section, made up of five branches: aircraft, power plant, equipment, materials and armament. Besides the extensive research programs each section has under way so that future planes may be better than present ones, each section checks on its particular phase of a new plane submitted to the Army.

It is not until each has certified that the features of particular concern to itself are satisfactory, that the plane can be considered for equipping the Air Corps. Even after that, as a matter of fact, an experimental ship's days of trial are not over. If it is of a radically new type, the Army may order only a dozen more so that it can be more thoroughly



AIR VIEW

Wright Field from the air showing the research laboratories in the left foreground, testing laboratories at the right, and hangars, fan-shaped, in the right foreground.



ALTITUDE TESTING

Captain Armstrong seated in foreground is communicating by telephone with officers undergoing special altitude tests inside the pressure chamber.

proved by test service and so that tactics for its use may be worked out by combat officers.

Over and above these intensive activities is one of the greatest aeronautical research programs in the world, most of it now wrapped in deepest secrecy. It will not be neglected, despite the rush of test work now on the horizon. The charge of providing the Air Corps with the best equipment obtainable includes also developing what cannot yet be bought, the Materiel Division and Army chiefs hold. Civil aviation has benefited in dozens of ways directly from this research program. Some developments, for example, have even been useful in fields outside both national defense and aviation. The world's first single-cylinder engine for testing the knocking of gasoline is a Wright Field product. Its use by civilian engineers has brought better automobile engines and better fuels, both resulting in improved performance and efficiency of your automobile.

45-Foot Propellers Tested

The Materiel Division has a wealth of equipment for carrying out its manifold duties. The largest propeller test rig in the world, capable of whirling a 45-foot propeller—three times as large as any actually in service—at speeds up to 4300 revolutions a minute is at Wright Field. It takes a 6,000 horsepower motor, more powerful than any railroad locomotive in existence, to turn such a huge blade at that speed.

You can hear the roar of engines in the test stands in the dynamometer laboratory—where an engine's power is rated—as you drive into the guarded entrance. Even though fundamental research in aerodynamics is left to the National Advisory Committee's elaborate laboratory at Langley Field, Va., and a new one is to be built as part of a \$1,300,000 expansion program financed by the Works Progress Administration. The Army must know the effect of adding a gadget to one of its planes and the wind tunnel furnishes the most satisfactory means of finding out.

Another building has one of the best collections of sandbags and lead bars extant—but their purpose isn't deadly. They are there to crack airplane wings and other structures—or at least make sure that they can stand up and take the loads to which they are subjected in flight. This is particularly important because military pilots and planes are called upon to perform strenuous maneuvers no private or commercial pilot in his right mind would think of doing. Many a wing that might have come off at the end of a 300-mile-an-hour power dive came off in the static load laboratory instead and was rejected.

You can go up to altitudes of 40,000 feet without ever taking your feet off mother earth in another laboratory—in an altitude pressure tank which copies the low air pressures of the upper altitudes so that Capt. Harry G. Armstrong

and his Medical Corps associates in the Physiological Laboratory can find out what happens to human beings under these conditions. The Signal Corps of the Army also maintains a radio laboratory at the field; it is responsible for all Army radio, aloft and on the ground.

In five years airline passengers will be making transcontinental trips at flight levels as high as 30,000 feet. They will be able to thank the Army in large part for that. The world's first pressure cabin airline actually to fly in the stratosphere is an Army baby: the Lockheed XC-35, which won its pioneers the Collier Trophy for 1937, an outstanding aviation award made annually in recognition of important trail-blazing aloft.

The first blind landing in history was executed by Capt. A. F. Hegenberger at Wright Field in 1932. In two or three years, blind landings will be commonplace on the airlines. The system eventually adopted will feature standards the Army has found are necessary to safety and has wisely insisted on. The Army will have its way because the same system must be used all over the nation.

Three Army pilots even carried that one step further in 1937 by making a completely automatic landing, and now they are working on automatic take-off. If we ever have robot airplanes, Uncle Sam's engineers and aviators will have owing to them a major portion of the credit.

Wright Brothers Honored

Perhaps in recognition of Dayton's contribution to aviation as the home city of the Wright brothers, the busy Ohio city has always been the locale of Army air experimenting and testing. During the World War the Army established McCook Field. When McCook became inadequate, the citizens of Dayton presented the government with a tract of land they had bought just outside their city. That is where Wright Field is now.

Running such a vast organization as this has its heartaches and headaches, too, as well as its accomplishments. Twenty-two names are inscribed on the field's roll of honor—those whose lives, in the disasters attendant upon trying the unproved, have paid for progress. And Wright Field's headaches include the loss of key civilian engineers who too often leave government employ because of the greater return to be gained by working for one of the rapidly-growing private aircraft plants. That problem has become particularly acute during the



FOR TESTING

Propeller test rig with propeller mounted and ready for testing.

last year, with the tremendous expansion of aircraft production.

Guarding Wright Field's secrets is another worry. The visitor is welcome, but he had better not go where he isn't entitled to—for the Army has a unique system for seeing to it that even the curious stay within bounds. Visitors, upon registering, are given lapel badges, differently colored according to where they are to be permitted. The Army had to resort to its many-hued identifying badges because of the large number of visiting aircraft manufacturers and others who have legitimate and pressing business with the Air Corps' engineers and airplane purchasers.

Aviation has come far during the last decade and the U. S. Army Air Corps can claim many of the mileposts along the way as its contributions. You can still see these contributions and the story of progress they contain in the hangars. Aviation's and Wright Field's story is told in the varying types of planes present—from slow bi-plane fighters and bombers of years ago, all clumsy with struts and "barn doors" into the wind, to the sleek knife-like creatures the mechanics are bending over today.

Perhaps some of these old "crates" will have to be moved out of the hangar and across the nest of buildings to the Army's new Aero Museum in one corner of the field. If so, it will be to make room for the new flock, born of a determination

to arm in the air, and be quick about it, as a result of the urgency of the new program. Wright Field has never been a lazy place. But you ought to see it now.

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Science News Letter, July 8, 1939

ARCHAEOLOGY

Find Ancient "Pittsburgh" Built By King Solomon

THE "PITTSBURGH" of ancient Palestine, and the prototype of the modern factory town is being uncovered in Palestine where it is believed to have been laid out and constructed by King Solomon.

A new campaign of excavation has just been completed by Nelson Glueck, director of the American School of Oriental Research, Jerusalem, whose report was made public by Prof. Millar Burrows of Yale University, president of the American Schools of Oriental Research.

The city, Ezion-Geber in the Bible, which was also Palestine's most important seaport, was built in the tenth century before Christ, Dr. Glueck says. Until last year the exact location of Solomon's seaport had long been unknown, but explorations near Akabah had laid bare the site, now known to the Arabs as Tell el-Kheleifeh. Akabah is located on the northern end of the Gulf of Akabah, which is the eastern arm of the Red Sea, the Gulf of Suez being the western arm.

"King Solomon alone in his day had the ability, the vision and the power to build a great factory town and seaport a comparatively long distance from the capital city of Jerusalem," the report says. In Solomon's time, Ezion-Geber was a strongly fortified factory site and many of its buildings were heated.

"The city had an extensive system of smelting and refining plants, whose walls were likewise pierced with a more intricate arrangement of flues and air channels, than had been previously suspected. The excavations are by no means concluded as yet, but it seems safe to assume that much of the town was occupied by an elaborate complex of smelters and refineries with the necessary air blasts for the furnaces furnished by the strong winds blowing almost continuously from the north. The entire town was, considering the country and the period, a great factory site of a nature unpar-

alleled in the history of the ancient Orient."

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ZOOLOGY

Monkey Birth On Island Assures Success of Colony

BIRTH of a very important baby was recently flashed by radio from tiny Santiago island, half a mile off the coast of Puerto Rico.

The infant is not of royal birth, or the child of a high official—nothing but a tiny, inquisitive monkey baby. Its birth is important because it indicates that the colony of 400 monkeys from southeastern Asia, planted on this 36-acre island a few months ago, is going to increase and multiply, and possess that corner of the earth.

The radio announcing the arrival of the Number One monkey baby adds, "From all appearances numerous others expected in very near future."

The colony of Asiatic monkeys was established on Santiago island as a joint enterprise of Columbia University and the Puerto Rico School of Tropical Medicine, in the hope of ending American scientists' expensive dependence on monkeys shipped halfway around the world for experimental purposes. For tests of causative agents and possible cures of certain diseases, such as infantile paralysis, ordinary laboratory animals like guinea pigs will not serve. Aside from human beings, some diseases will attack only our closer kindred among the animals, so for such purposes monkeys have to be used.

The monkeys on Santiago island have full freedom of the place. The only human beings who live there are Mr. and Mrs. Michael Tomilin, who set out food, keep an eye on the health of the colony, and act as the "government" of the simian paradise.

Science News Letter, July 8, 1939

The 17-year cicadas are out in Illinois and neighboring states this year.

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