

the gate, was built by first settlers at Troy, Dr. Carl W. Blegen, field director, announced.

"This first Troy, which began before 3000 B. C. and continued at least no later than 2500 B.C., probably was ruled even then by a king," Dr. Blegen explained.

Troy was rebuilt no less than nine times, as one Troy after another met with some disaster. The seventh city is now believed the one conquered by the ruse of the Trojan Horse, after Greeks vainly besieged its walls for 20 years in order to reclaim stolen Queen Helen, in the twelfth century B.C.

Discovery that Trojans of 3000 to 2500 B.C. had their own distinctive art is also revealed. Dr. Blegen reported finding a heart-shaped human face carved on a slab in a parapet. Pronouncing this sculpture older than any ever found in Greece or Crete, both centers of extensive archaeological investigations, Dr. Blegen said this Trojan art is far from crude. It is as old as Egypt's famous Old Kingdom sculptures, or the great carvings found in Mesopotamian cities. "It is to be inferred," said Dr. Blegen, "that this earliest Troy not only had a king but a royal court, as well, which fostered progress in art."

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A TOWER OF ILIUM

Not "topless" were these first towers of Troy, nor able to boast of highly finished construction; yet for their time they were doubtless formidable. This one guarded a city gate.

its destination, and landing, the whole being accomplished completely automatically, thereby relieving the flight crew of all duties other than observing the instruments to see that the equipment is functioning properly."

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AVIATION

Robot Lands Airplanes Without Aid From Pilots

A FORECAST of the future of aviation, when planes will take off and land automatically without human effort, was made at the meetings of the Society of Automotive Engineers by Capt. G. V. Holloman of the U. S. Army Air Corps of Wright Field, Dayton, Ohio.

Under the new system, which the Army has already used on great cross-country flights from the Midwest to New York, to Virginia and then back to Wright Field, the landings of the planes have been entirely without action by the pilot, whose only job is to see that robot mechanisms are operating.

Under the automatic blind landing system a plane has only to get within 20 miles of even a fog-bound airport and it arrives safely at its destination. Four shortwave radio stations, plus the automatic controls in the plane, accomplish the actual landing.

When within 20 miles of the first radio station the pilot levels off the airplane, lowers the landing wheels, adjusts the landing flaps and sets the propellers for their minimum pitch. Then he closes a master switch and can sit back.

The robot controls turn the plane toward the first station of the landing system and adjust the gasoline throttle until the plane is in a glide that will take it down to 1,000 feet above the elevation of the runway of the airport. If this altitude is reached before the plane flies over station No. 1, automatic adjustment levels the plane off into constant altitude flight at 1,000 feet.

When the plane comes over station No. 1 (five miles from the airport) the radio homing device automatically tunes on station No. 2, having a slightly different radio frequency. At the same time the plane is held in level flight at the altitude of 1,000 feet. When the plane passes over station No. 2 (two miles from the airport) the robot controls tune the landing device on station No. 3, which is directly in front of the landing runway at the airport.

At the same time the controls put the plane in a long glide at the rate of 400 feet drop per minute. It holds this glide until an altitude of 200 feet above the elevation of the runway is obtained and then the plane is automatically leveled off at 200 feet altitude.

At station No. 3 the robot tunes the controls on station No. 4, which is at the opposite end of the airport's runway and thus fixes the line on which the plane will land. At the same time the plane is put into its "let down" glide—as pilots call it—and again drops down at a rate of 400 feet per minute until it touches the ground.

At the instant of contact with the ground the robot controls push in the throttle and cut off the gasoline supply and, at the same time, operate gently the brakes on the wheels to bring the plane to a stop.

Capt. Holloman adds:

"Now that automatic landing is an accomplished fact, it is well within the realm of reason to visualize an airplane taking off from an airdrome, flying to

AVIATION

"Flight Strips" Proposed To Aid Distressed Planes

DESPERATE hunts for landing fields, with the gas getting low and the fog closing in, may be a thing of the past for airline pilots, if the scheme proposed to the 35th annual convention of the American Road Builders Association by Lt.-Col. Stedman S. Hanks is adopted. Instead of cruising around hunting for a place to land, pilots of the future will find a highway and set their planes down on "flight strips" built beside the main roads by the highway departments.

Proposed not only as emergency landing fields, but for the use of private pilots, these paved strips beside main highways, at least 200 feet wide and 1800 feet long, built and maintained by highway engineers, on state-owned land, may also be used as way-stations, from

which airmail and air freight may be picked up by arrangement.

Citing their possible convenience, Col. Hanks quotes a possible conversation of the future, between the pilot of the Bangor-Boston airmail plane and the Boston airport. The pilot has noted fog rolling in from the sea, and has been told that Boston is completely blanketed, "zero-zero" and will be for eight hours more.

Boston tells him, "Not a chance, Bob. Work into Boston as close as you can, then set your plane down on a flight strip. We'll send out a mail truck to the flight strip and pick up the mail."

Already, uniform enabling legislation has been drawn up, and is in the hands of state governors for consideration. Flight strips may range from 200 to 740 feet wide and from 1800 to 5000 feet long, depending on the type of aircraft they are designed to accommodate.

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ARCHAEOLOGY

Indians Had Syphilis— Along White Man's Trail

SYPHILIS, disease now nationally fought in America, apparently afflicted almost half the Indians in some communities along the Potomac River.

Displaying Indian bones marred by disease, Dr. T. D. Stewart of the U. S. National Museum raised the question: Where did syphilis come from?

Prehistoric America has generally been blamed for giving the world this serious malady, Dr. Stewart told the Anthropological Society of Washington. Recent discoveries in Virginia and Maryland warrant re-opening the question, and may lead to the opposite verdict, that white men from Europe brought syphilis to America.

Possibility that the Maryland and Virginia Indians caught their disease from white men of Jamestown or other explorers or colonists is pointed out by Dr. Stewart, who finds particularly significant the spreading of the disease through so many Indians in one group. This is the way the malady would spread, he explains, and it is curious that supposedly very ancient cases of syphilis in America have been single skeletons, or Indians of uncertain antiquity.

Indian bones marked by ravages of syphilis have a characteristic spongy surface, which Dr. Stewart says was caused by inflammation of the covering membrane of the bone during the afflicted Indian's lifetime.

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ASTRONOMY

Dome for 200-Inch Telescope Is Now Nearing Completion

Mt. Palomar Observatory Structure Is Scheduled for Finishing on February 1; Instrument Under Construction

By DR. R. M. LANGER

See Front Cover

THE DOME for the great 200-inch telescope on Mt. Palomar is practically finished structurally and California Institute of Technology engineers can now breathe easier while completion and installation of equipment takes place under its shelter during the next couple of years. By February 1 the dome itself will be complete.

The external shell is still to be painted outside and in with aluminum paint, miles of wiring for electrical circuits are still to be put into place and of course the great telescope itself is far from completion.

Economical in size for the giant telescope it is to house, the dome covers about half an acre and is 137 feet in diameter. Above a cylinder seventy feet tall is a slotted hemisphere through which the telescope will look out at any angle with the horizon.

The upper part, including the hemisphere and twenty-seven feet of the cylinder below it, can be rotated to any direction of the compass so that the instrument can see through the slot any part of the sky available in these latitudes.

Trucks Carry Dome

The fixed part of the dome is devoted to offices, laboratories, storage space and photography rooms. On top of the thirty-foot outer wall is a circular track on which the movable upper portion of the dome rolls on thirty-two four-wheeled trucks, each carrying four heavy springs wound with 1½ inch steel rods.

The room within this moving structure is solely for telescopic observation. There are no appendages or supports to impair the clearance of the telescope tube no matter which way it points. The vault is about ninety feet high from the floor of the observation room to the center of the ceiling. Visitors will not be admitted into this room at all but will have access during special hours to a gallery walled off and insulated from the main observation room.

The moving portion is built from

three-eighths-inch steel plate, welded together from pieces of from one to two hundred square feet each. No bolts or rivets are used and the plates are fitted to the required spherical or cylindrical shape in advance. Each plate weighs about a ton. The moving portion of the dome weighs about one thousand tons.

There are two great arches three feet wide and eight feet deep alongside the shutter opening, and a horizontal plate girder near the bottom of the moving part to keep the cylinder circular. The rigidity of the steel shell is such that only slight additional structural support is needed.

This inside framework was erected first to hold the plates during the welding process and to prevent buckling afterwards. This so-called monocoque type of construction, developed and used with such success in the airplane industry, gives the dome the right to be called streamlined in the sense that it is a modern edifice.

The inner surface of the dome is made up of aluminum-faced steel boxes four inches thick hung from the steel shell. These boxes contain layers of aluminum foil to keep out the heat of the sun, so that when night comes the instrument will already be at night temperature and no precious time will be lost having to wait for a gradual dissipation of heat and change of shape accompanying the cooling process.

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GEOPHYSICS

Magnetic Storm Disrupts Wire and Radio Services

MAGNETIC storm conditions of unusual severity wrought havoc in both wireless and wired communications from Jan. 16 to Jan. 18, while auroras flared over the North. Telegraph engineers reported that they had great difficulty getting traffic through from the East to the interior of the country, and radio telephone service to Europe was still out of commission on the eighteenth.

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