



TOWER TELESCOPE

In these buildings of the McMath-Hulbert Observatory, will be housed the new tower telescope which, it is hoped will add greatly to scientific knowledge of the sun.

ASTRONOMY

Netherlands Invasion May Halt Completion of New Telescope

German-Made Glass Disks for Some of Optical Parts Held by British Contraband Control; Fate Not Known

THE NAZI invasion of the Netherlands may delay indefinitely completion of the new tower telescope of the McMath-Hulbert Observatory, to be dedicated on May 25, as part of the University of Michigan. German-made glass disks for some of the optical parts, though ordered before the outbreak of war, have been delayed in Amsterdam, awaiting release by the British Contraband Control. Their present fate is not known, though it is hoped that they may have been released before Amsterdam fell.

The new telescope, and a laboratory building from which it rises in a 70-foot tower, are the gift of the McGregor fund to the University of Michigan. Their dedication will bring new recognition to Dr. Robert R. McMath, who takes time from his business of making automobile equipment to take movies of the sun.

Dr. McMath founded the Observatory in 1929, with the aid of his father, the late Francis C. McMath, and Henry S. Hulbert, former Detroit probate judge, who

is now president of the McGregor fund. In 1931 the founders deeded the Observatory to the University of Michigan, but Dr. McMath has continued in charge.

Important new facts about the sun have been discovered by the McMath-Hulbert Observatory researchers. Most of these studies are with motion pictures taken through a special type of telescope. Those in the past have been made with a tower 50 feet high, at the top of which are two mirrors to reflect the sun's light down into the telescope itself. Under the tower is a pit containing a spectroscope, analyzing the sunlight into the colors of which it is composed. The movies are made in the light of a single element of the sun's atmosphere. Ordinarily we see the sun by the light of all the elements combined.

Rising high above the new building is the new 70-foot tower, which will supplement, but not replace, the work of the older tower.

Many thousands of feet of film have

been exposed on the sun during the last few years, during which it has been in great activity. These show, very spectacularly, great flame-like masses of hydrogen and calcium shooting out from the sun to vast heights, a million miles or more. But the careful study of these films, picture by picture, has revealed that the stuff shot out makes sudden and inexplicable changes in velocity. It will travel for a hundred thousand miles or so at one speed, then immediately start moving at a much faster rate.

Another puzzling phenomenon is the way these glowing gases sometimes appear high above the sun's surface, seemingly materializing out of nowhere. For hours there will be a continual supply, as if from some invisible hose. In other cases gases are shot up, and then fall down again. From the researches now being made, it is hoped these effects will be explained.

Science News Letter, May 25, 1940

PHYSIOLOGY—PSYCHOLOGY

Lights Flashing in the Eye Produce Waves in the Brain

WHEN your eye sees the flash of a bright headlight streaking past you, a burst of electric waves is set off in a part of your brain. This electrical display in the brain was described by Dr. Samuel A. Talbot, of the Wilmer Institute Laboratory of Physiological Optics, before the Washington-Baltimore Branch of the American Psychological Association.

The waves are not those known as "brain waves" which are generated in the brain cells themselves. The brain waves—"alpha rhythms" as they are called by scientists—were completely damped out in Dr. Talbot's experiment by use of an anesthetic. The anesthetic also stopped all the electrical activity of the "association" or thinking area of the brain.

But when Dr. Talbot flashed exploring lights into the eyes of his experimental cats and monkeys from different parts of the animal's field of vision, he was able to tap the electric signals as they appeared in the brain. So sharply localized were the "message centers" that received the signals, that Dr. Talbot was able to map the part of the brain that governs vision just by electroplating with a minute spot of iron the exact position where the electrode picked up the electric impulses as the lights were flashed from a corresponding point in the visual field.

Psychologists have observed that when you have looked at a bright flash of light

you will continue to "see" it for a little while after it is turned off. During this time it will pulsate rapidly. For this reason, a band of light passed across your field of vision may appear to you like a series of bright stripes. A single flash of

light may appear as a sort of vibration. This rapid fluctuation in vision has its parallel, Dr. Talbot found, in a volley of multiple electric waves at the point in the brain concerned with perceiving the light.

Science News Letter, May 25, 1940

AERONAUTICS

Bombers for Allies Could Be Delivered Under Own Power

All of Five Bomber Types Under Construction Capable of Making Flight by Short Northern Route

MASS transatlantic flight deliveries of American bombers now on order for the Allies are envisioned as blitzkrieg and counter-blitzkrieg in Europe begin eating rapidly into aircraft reserves.

All of the five bomber types now under construction for the Allies, particularly if extra gasoline supplies are loaded, are capable of making the North America-to-Europe flight by the short northern route. The planes could be flown to Foynes, Eire, or directly to England from Botwood, Newfoundland, in summer use since last year as a seaplane base for Pan American Airways and Imperial Airways flying boats. A large landplane field is part of the Botwood base.

Any doubt as to the possibility of such deliveries should now be dispelled as a result of the occupation of Iceland by British forces. The Allies are now in a position to use Iceland as a refueling point for any bombers of whose ocean-spanning ability there is any doubt. The nature of facilities at Reykjavik was not immediately known, but however bad they may be they could be quickly enough improved.

The five bomber types on order include: \$9,000,000 worth of Consolidated 28-5 flying boats, similar to the U. S. Navy's famous PBY patrol bombers. Delivery of these is expected to start this summer. They would be flown to Europe in any event. A 28-5 purchased by England a year ago for test purposes was flight delivered last summer.

France has already taken delivery on most of 100 Douglas DB-7 attack bombers. Extreme range of these 310-mile-an-hour medium bombers can be built up to 2200 or 2300 miles by loading gas in place of military equipment and the normal 1,250-pound bomb load.

The same is true of the 390-mile-an-hour Douglas B-20 attack bombers, of

which several hundred are being built for the Allies and the U. S. Army Air corps. An additional order for at least 1,000, to be built by Consolidated and Boeing under license, has just been placed.

Globe-girdler Howard Hughes flew a Lockheed 14 non-stop to Paris, 3,300 miles, in the summer of 1938 on the first leg of his epoch-making round-the-world-flight. It is therefore expected that the 500 Lockheed Hudson bombers already delivered to Great Britain could have made the journey. A further order for 250 Lockheed bombers, based on an improved Lockheed plane, is currently under negotiation. These can also be flight delivered by filling up the cabin with gasoline tins.

No large four-motored craft have been ordered yet by the Allies, so far as is known. None are expected to be purchased, as many military experts hold that they are not suited to conditions in Europe.

The U. S. Army Air Corps has in service about 350 bombers capable of flight across the Atlantic. These include about 225 Douglas B-18 as derived from the world-famous Douglas DC-3 passenger liner, and about 100 four-motored "Flying Fortresses," 20-ton Boeing B-17 bombardment craft.

The Navy has more than 250 twin-motored patrol bombers, mostly fourteen-and-a-half-ton Consolidated flying boats.

Many of the 215 (at least) 320-mile-an-hour Martin 167W attack bombers ordered by France have also already been delivered, but the rest could similarly be rushed across the Atlantic by air.

None of the high-speed bombers, of course, would be flown at more than a fraction of their top or even normal cruising speeds, in order to cut down fuel consumption and make the ocean flights possible. A probable transatlantic flight

speed for the two Douglas and one Martin models is about 200 miles an hour. A few four-motored Consolidated and Sikorsky ships are also on hand or on order.

A squadron of twin-engined Martin patrol bombers, which can also easily make the hop, were delivered to the Navy during the last year but considerable trouble has been had with them and they were returned to the factory at least for a time.

The weather is now almost ideal for flight deliveries.

Biggest problem the Allies will face in high-speed-under-their-own-power shipment of the anti-Nazi airplanes will be that of securing pilots with adequate experience. American pilots may be hired as "ferry men"—many have already been hired as instructors for the Empire air training program, now getting underway in Canada. These have not had to give up their citizenship as they take no oath of allegiance to Britain. Their work violates no American laws.

American-born pilots are also serving in the Royal Air Force and the Royal Canadian Air Force. These, of course, have given up their citizenship as they had to swear allegiance to the King.

In what way Americans ferrying war craft to Britain would be penalized, American laws are not exactly clear. The neutrality act prohibits Americans from working or traveling on belligerent ships and aircraft or foreign vessels entering the belligerent zone as defined by proclamation of President Roosevelt. Competent American pilots could be found in the ranks of the Army Air Corps.

In an emergency, instructors in the Empire training program could also be put to work on ferrying aircraft across the ocean. But the pilot problem, it was emphasized, is the biggest difficulty to be solved before large scale flight deliveries become possible.

Title to the planes would, of course, have to be transferred to the Allies before the planes leave the U. S. by Allied pilots as has been the case since the start of the war.

Science News Letter, May 25, 1940

Gold mining is an expanding venture in the Fiji Islands.

Sea ice loses a good deal of its salt as it ages—the salt migrates from the interior.

The world's longest floating bridge, under construction across Lake Washington near Seattle, will be a mile and a quarter pontoon span.