

infra-human environment as well as their physical make-up would permit. They can ape better than the apes. A human child living among apes or

wolves would be expected to do as the apes or wolves do. This might indicate high intelligence rather than low.

Science News Letter, July 13, 1940

AERONAUTICS—RADIO

New Rotating Radio Beam Directs Pilot to Fixed Beacon

BY MEANS of a radio beam which sweeps around the horizon 60 times a second, airplane pilots can now find their course to a fixed beacon at all times.

A dial on the instrument board displays a circle of light, around which an indicating mark moves to show the direction of the plane from the beacon.

Dr. David G. C. Luck described the new device to members of the Institute of Radio Engineers at their Boston meeting. It was developed under his supervision in four years of research at the RCA Laboratory at Central Airport, Camden, N. J., and is known as the "omni-directional radio range beacon," and operates on ultra-high-frequency, minimizing the effect of static. It also permits the use of a small, two foot high, antenna, instead of a group of high towers.

Previous radio beacons confine the pilot to a definite course. As long as he is following the course he knows it. If he goes off, he is also informed. But, though he can tell which way he is off, he cannot tell how far he has left the course, nor what direction his destination may be. To provide this information, some air lines have used direction finders

on the plane, which show the direction to the beam transmitting station from the plane, but these are not satisfactory in the ultra-high-frequencies.

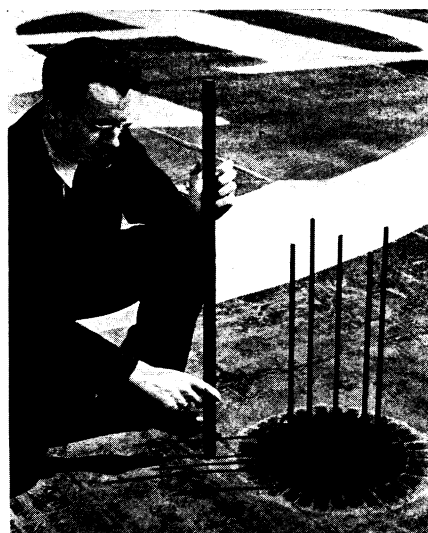
Dr. Luck described the operation of the new system as follows:

"If the pilot must fly around bad weather on his regular course, he can always 'see' his direction from the radio station at a glance. If he wants to fly straight into or out from the beacon, he has only to hold the mark steady at that course against a scale on the instrument face.

"All this works like a lighthouse that sends out two kinds of light, one a beam which sweeps around steadily and the other a flash sent out in all directions just as the beam points north. Time the interval from the flash until the beam sweeps over you, and you know your exact direction from the lighthouse.

"In this new radio range, the radio lighthouse is on the ground and on the plane the indicating instrument automatically times the flash and beam. All this is done electrically, and our lighthouse beam sweeps clear around 60 times each second."

Science News Letter, July 13, 1940



IN SMALL COMPASS

Instead of five 125-foot towers, required for long wave radio range systems now in use, these five two-foot metal rods are all the antennae needed for the new Omni-directional Radio Range Beacon, developed at the RCA research laboratories in Camden.

at strategic points all over the Near East. Controlling channels of trade, they enjoyed wealth, amid the poverty and hunger of the conquered.

However, says Dr. Wilson, their "frightful engines of speed and power, meaning horses and chariots, could not be kept out of Egyptian hands. And Egypt, re-armed, and stiffened by a united spiritual force, smashed the Hyksos confederacy in battle, battered open the supposedly impregnable fortresses and threw the invaders out of Egypt. That did not happen until May 12, 1468 B.C.

The liberated Egyptians then turned to empire-building, themselves. Astutely timing their advance, they advanced toward Hyksos-controlled Palestine and Syria in spring, when their own harvest was in, while the more northerly lands were still being worked by the manpower. Outwitted by this strategy, the people and their food supply were soon at the mercy of the Egyptians.

In a later era, the Egyptian empire fell victim to fifth column tactics, Dr. Wilson shows. Powerful Hittites, living where modern Turkey is now, formed a fifth column among disloyal and discontented Egyptians of upper classes, while the Pharaoh Akhnaton was devoting himself to idealistic religious reforms, ignoring danger trends.

"There were many," says Dr. Wilson, "who took bribes of the Hittites to work

ARCHAEOLOGY

Blitzkrieg, Secret Weapons Downed Ancient Egypt

IF NAZI Germany continues to repeat the conquering career of the Asiatic Hyksos nearly 1800 years before Christ, civilizations now trampled may expect to rise and fight again, and win. But not very soon.

Citing the Hyksos lesson from history, Dr. John A. Wilson, director of the University of Chicago's Oriental Institute, finds that these Asiatic soldiers of adventure effectively used the modern

German formula of secret weapons, launched with blitzkrieg speed and surprise. Turning horses and chariots suddenly into the midst of old-fashioned Egyptian and Babylonian foot soldiers, the Hyksos spread terror and confusion, as the flying chariots wheeled and advanced, and mowed down the unprepared men.

In the peace following conquest, the Hyksos planted impregnable fortresses

against Egypt and break up the empire, even while writing pharaoh cooing letters of submission."

When the fifth column had bored sufficiently into Egypt, the Hittites marched down, probably armed with a new secret weapon—iron lances and

swords—to devastate the still behind-the-times Egyptians, armed merely with bronze. With this force attacking, and with internal troubles of organized rackets, strikes, and plundering bands of roaming soldiers, Egypt collapsed.

Science News Letter, July 13, 1940

AERONAUTICS

Despite War, the English Discuss Civil Aviation

Possibility of Passengers Crossing Atlantic in an Overnight Hop Is Foreseen By London Expert

POSSIBILITY of passengers crossing the Atlantic, between London and New York or Montreal, in an overnight hop, in planes travelling 300 miles an hour, is foreseen by Dr. H. Roxbee Cox, formerly chief technical officer of the Air Registration Board, in a recent address to the Royal Aeronautical Society in London. (*Flight*, June 6)

"There can be no doubt that when a country is fighting for its life, its primary aim is to win the fight," Dr. Cox said, "but it is generally agreed that we are fighting also for our civilization. It would seem axiomatic then, that we must preserve the means of civilization, of which civil aviation is one."

He suggested that safety requirements might be varied depending on the route of the flight. Over cool flat countries, between sea level airports, planes could carry more passengers than when flying over mountains, between high altitude fields in the tropics, he said. In recent years, the British practice has been to set minimum requirements to suit the worst conditions, but this, he stated, is uneconomical.

He called attention to the present transatlantic schedule of Pan American Airways planes, which operate at a speed of 170 miles per hour, making the trip eastward in 29½ hours and westward in 24 hours, allowing for the time difference in England and the United States, and the prevailing westerly winds.

"After this," he declared, "the obvious big step forward would be to make the journey overnight. That we cannot at present consider this is clear from the calculation which shows that, though a westward speed of 240 miles per hour would be adequate, an eastbound speed of 486 miles per hour would be required.

"An approximation to the overnight ideal is possible at 300 miles per hour. This would allow arrival at Southampton at 10 a.m., if departure had been made from Montreal at 6 p.m. the previous day. I suggest, then, that the next big advance in operational speed will be to 300 miles per hour.

"What degree of comfort should be supplied at this speed? The westbound passengers will be on board only 13, the eastbound only 11 hours, and most of this time may be spent in bed. I suggest that weight and space might be more profitably expended in comfortable beds than in promenade decks and wine cellars."

With a daily service, he stated, it would probably not be necessary for some time to cater for more than 250 passengers and 20,000 pounds of mail per week. This would be about 35 passengers per day, but to deal with fluctuations in load, the aircraft would probably need to have room for 50 passengers. He also suggested that it would probably be necessary to make the direct North Atlantic route, now used only in summer, an all year round one.

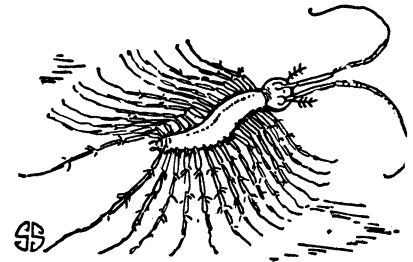
"There is, therefore, ahead of the operators a highly interesting and perhaps exciting period," the speaker declared.

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New *plastic tubes* can shoot light around corners.

The first self-hardening tool *steel* was produced in 1868.

Barnum's six and one-half ton elephant, *Jumbo*, had a daily ration of 200 pounds of hay, two bushels of oats, a barrel of potatoes, 15 loaves of bread, and several quarts of onions.



Unappreciated Arthropod

LAATEST contribution to the literature in dispraise of the centipede is a jingle that runs something like this:

I do not like the centipede,
He is a bug we do not need.
He runs from the bathroom through
the hall
And up and down the bedroom wall;
You always swat where he is not—
And when you do it leaves a blot.

Just why the poor centipede should be swatted at all, blot or no blot, is not answered. The whole attitude of the average person, and particularly the average housewife, can be summed up in, "Here's a bug. Swat it!"

It matters not that the centipede is not a bug, not even an insect. It matters not that the common house species is completely harmless to man. It crawls and wriggles, and it has too many legs for our mental comfort. So we reach for the swatter.

Actually the centipede does do the householder at least a minor benefit, by preying on flies. Being nocturnal, it does its prowling on the ceiling in the dark hours when flies are suspended by their feet, fast asleep. Stumbling on its victim in the dark, the centipede instantly fangs the fly, sometimes falling to the floor through the vigor of its pounce. But it never lets go of the fly.

Of course, it is a bit disconcerting to find a centipede in your bathtub in the morning, where it has fallen during the night and cannot get out again. For although its clinging feet can easily find upside down footholds on the slight roughness of wallpaper, they are no match for the slippery enamel of plumbing. So all you can do is scoop him out with a piece of paper, usually mangling him beyond recovery in the process.

Centipedes are almost unbelievably