AERONAUTICS

Anti-Icer Perfected

Consolidated Catalina is first airplane equipped with device which shoots hot air through ducts on wing and tail surfaces to prevent ice formation.

➤ ANTI-ICERS for warplanes, which shoot hot air through ducts under wing and tail surfaces to prevent dangerous ice formations, have been perfected and are now being installed to make combat flying safer. In post-war flying the equipment promises to banish at last the air disasters due to icing which have occurred since the beginning of aviation.

Announcing that the Consolidated Catalina, a long range patrol bomber, is the first airplane off the production line equipped with the new device, Consolidated Vultee Aircraft Corporation revealed that plans are under way for installation of the thermo anti-icing systems in the Liberator and Coronado bombers and the new Navy flying patrol boat, P4Y-1.

Other sources indicate that several additional aircraft manufacturers are discussing adoption of this equipment and are working on the necessary design changes.

Ice elimination by means of heated air was conceived and developed over a period of years by the National Advisory Committee for Aeronautics, government research agency. Consolidated Vultee engineers have been active in perfecting the equipment, cooperating with the NACA technical staff.

In this anti-icing method, hot exhaust gases are used to heat air which is then circulated beneath wing and tail surfaces. Controlled initial temperatures range as high as 350 .degrees Fahrenheit. This heated air keeps the aluminum alloy leading edges at a temperature of about 60 degrees Fahrenheit and warms the entire wing surface to a lesser degree.

Early research encountered problems of overheating and thermal expansion of the metal surfaces, which have now been overcome. Test flights in the far North have shown that the device functions perfectly.

Air ducts can be installed to supply heated air to the leading edges of the wing panels, from which the air sweeps back through the interior of the wing and over the aileron, preventing the icing of aileron controls. Tail surfaces are likewise kept free of ice. In an installation, such as has been made on the Liberator, hot air is also conducted forward to the cabin and flight deck, where it defrosts pilots' windshields, bombardier's window and heats the cabin.

Several advantages are claimed for thermo anti-icing systems:

1. There is no danger of ice caking on the wing surfaces to destroy lifting power. The pneumatically operated rubber de-icers now commonly used are intermittently inflated with air to crack the ice off leading edges, but rough ice formations are often left on top of the wing which make the plane hard to control. The new thermo anti-icing system prevents ice from forming anywhere on the surface.

2. The device can be operated during combat, at slow flying speeds and during take-offs and landings, as there is no loss of aerodynamic efficiency in either wing or tail surfaces. As better planes required smoother wing surfaces, the lowered efficiency produced by rubber pneumatic de-icers became increasingly objectionable.

3. Destruction of accumulated ice and frost by the anti-icer begins as soon as the engines of the aircraft are started during sub-freezing weather and continues as long as the motors run.

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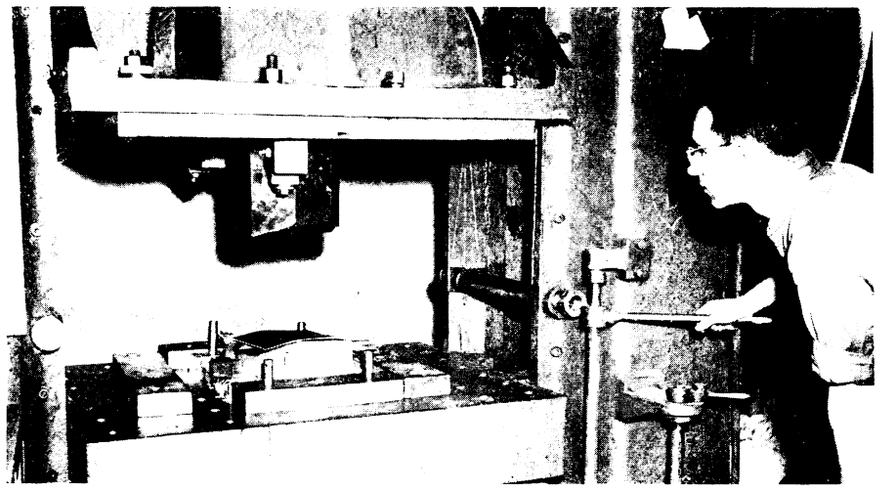
ANATOMY

Two Brains Discovered In Head of One Dog

➤ DISCOVERY, apparently for the first time on record, of a dog with two brains jolted scientists in the laboratories of the District of Columbia Health Department. Dr. John E. Noble, director, thought someone was playing a joke on him when first told of the discovery.

The two brains in one head were discovered in a collie of mixed type but no unusual appearance, by J. B. Holland. Mr. Holland was examining the dog's brain for rabies when he found the second, smaller brain behind the first but also attached to the dog's spinal cord. Evidence of rabies was found in both brains.

Authorities at the Bureau of Animal Industry, U. S. Department of Agriculture, declared they had never heard of such an anomaly before. Two-headed calves, five-legged animals and humans with an extra thumb or finger, yes; but a two-brained dog is apparently something new in the records. (*Turn page*)



PLASTIC PUNCH—To conserve critical metal in the manufacture of warplanes, the Curtiss-Wright Corporation at Buffalo has developed this plastic punch and die made of non-critical metal. Intended to save materials, the punch also saves valuable time for it can be shaped into a perfect fit with the die in a single operation; the die is heated and then the roughly shaped punch pressed to it. Pressure forces the plastic to flow and produces an exact match.

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Dr. Noble suggests that there may be more which never are discovered because, luckily, they fail to get rabies and have their brains examined after death. By the time the discovery of the second brain was made and verified, both had been handled too much to make it possible to preserve them as museum specimens.

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BIOLOGY

Tumors Causes Traced

Tumor-causing bacteria, rendered harmless, are nevertheless able to produce harmful growths when hormones are added. Have cancerous effects.

➤ TUMORS ON PLANTS, that are very much like animal tumors, even to the formation of cancerous dead areas within themselves and eventually killing the plants, are being studied by Dr. Philip R. White at the laboratories of the Rockefeller Institute for Medical Research. They are unlike animal tumors in that they are started by easily detected bacteria, but they are like animal tumors in that they can be transplanted into previously healthy tissue — and these transplants do not need to have the originally causative bacteria in them to continue their malignant growth.

Dr. White's latest efforts have been in the direction of finding how these bacteria operate to start the tumorous growth. He has not got the whole answer yet, but he is able to report one or two interesting leads.

One thing he has discovered is that the bacteria can be robbed of their tumor-causing power by growing them on nutrient media containing the protein fraction known as glycine. Bacteria thus treated can live in the tissues of the host plant, but tumors do not develop at the point of inoculation.

However, if the top of the plant is cut off, and the tissues around the infected spot are treated with a solution of one of the growth-promoting substances or hormones, tumors again develop, although bacteria taken from these new tumors are still unable to produce new tumors elsewhere unless they are again aided by growth-promoting hormones. But if bits of the germ-free tumors are transplanted into healthy plants, they will develop into big and harmful growths.

That is, even though the bacteria have been rendered harmless by themselves, they are still capable of being links in a chain of harmful development, that can go on afterwards by itself without them. As Dr. White phrases it, the plant's cells have undergone a "permanent and irreversible cancerization."

Another lead followed by Dr. White has been the suggestion that the bacteria themselves are not the cause of the mischief, but that they act as carriers of a virus, much as mosquitoes serve as carriers of the yellow fever virus. The hypothetical tumor virus, it was suggested, might then carry on in the plant tissues without further help from the bacteria.

To test this, Dr. White sought a plant species that could survive a degree of heat that is sufficient to kill known plant viruses. Such a species was not easy to find, but he located one finally, a garden flower known as the Madagascar periwinkle. This delicate-looking but really tough little plant can survive prolonged exposure to a temperature of 115 degrees Fahrenheit.

Inoculated with the tumor bacteria and held at this temperature for ten days, nothing happened; but when the temperature was lowered to an ordinary greenhouse level the tumors developed normally. In the meantime the bacteria themselves had disappeared—but before they died they managed somehow to bequeath to the plant tissues a heritage of abnormal growth.

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INVENTION

Portable Electric Fan Used in Any Position

➤ TIMELY in these dog-days is the invention of Edward A. Ebert of Buffalo, on which he received patent 2,325,754. It is a compact, easily portable electric fan, about the size of an ordinary baking tin and entirely enclosed. It can be set on a desk or table or hung on the wall, to blow a steady breeze in one direction. It can be laid flat on its face, in which case it sets up a milder general circulation that will not ruffle hair or disturb loose papers. Or it can be laid on its back, again to produce general air circulation.

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DESTRUCTION—This picture shows how the flow of lava uproots trees and burns them in its path.