

AERONAUTICS

Wax Preparation Makes Plane Windshield Seem Dry

➤ A WET but seemingly dry windshield on an airplane in a storm is obtained with the use of a new wax preparation developed in Ottawa by the Canadian National Research Council. It is a safety preparation to decrease wet windshield obstruction to clear sight.

The wax preparation is called FC-10 Rain Repellent. When drops of water strike the treated windscreen they break down into tiny droplets which then pass off into the airstream. The droplets move so rapidly that they are quite invisible. The windshield therefore appears dry and allows vision free from distortion or ripples.

In actual tests, visibility of two miles has been obtained through the treated area under conditions in which untreated areas allowed no vision whatever, the Council reports. The treatment has proved satisfactory at all airspeeds, even in excess of 600 miles an hour. While it does not shed ice, the repellent permits normal de-icing, either with heat or alcohol, and still functions properly in shedding subsequent rain.

Optical errors caused by rain on the windshield of an airplane are usually greater than the pilot realizes. Simulated flight tests with a water spray on a sheet of glass in a high speed air current, showed that the extent of these errors varies considerably with the size of water drops, the amount of water, the air speed, and the angle of the windshield. Tests further revealed that the average error is up to five degrees in angle in the line of vision. This means that a mountain peak half a mile ahead of a plane flying in heavy rain might appear as much as 200 feet lower than it is in fact.

Credit for the new wax preparation is given to Dr. D. F. Stedman of the Council staff. It has been tested by the Royal Aircraft Establishment in England and commercial transports in Canada. It is now being manufactured and marketed by a Canadian firm.

Science News Letter, May 7, 1949

ENGINEERING

British Life Jacket Holds Man's Face Out of Water

➤ A LIFE JACKET which will hold the face of an overboard man upward and out of the water is under development by the British Navy. It is but one of several improved devices to increase the chances of survival of persons forced to abandon ship on the high seas.

The life jacket is designed to replace earlier types life belts and jackets in which many men have died because unable to breathe. The new jacket will automatically turn even an unconscious man face upward and support him high enough to keep mouth and nostrils clear of the water.

A life-float has been developed which is somewhat similar to the rubber aircraft dinghy developed by the Royal Air Force for pilots downed at sea. In comparison with the life-rafts now used by the British Navy, it is lighter and is equipped with a tent-like covering for protection against all types of weather. The equipment carried by it will include food, water, signal lights, fishing line, sea anchor, first aid kit and a radar reflector.

An exposure suit, for men going overboard in Arctic waters, protects them from the severe cold and also helps keep them afloat. It is so designed that it permits swimming. In tests already made, three young officers donned the suits, jumped overboard and swam to a life-raft.

Science News Letter, May 7, 1949

PHYSICS

Cosmic Rays May Affect Operation of Planes

➤ COSMIC RAYS which are continually bombarding us without doing any apparent harm, may be a hazard to the operation of electrical equipment on future high-flying airplanes, a military scientist warned.

Dr. Urner Liddel, chief of the physical science division of the Office of Naval Research, said that if airplanes operate at altitudes as high as 100,000 feet, cosmic ray particles "may conceivably have some effect on electrical equipment."

Dr. Liddel and Dr. H. V. Neher of the California Institute of Technology described cosmic ray research programs now under way as guests of Watson Davis, director of Science Service, on Adventures in Science, heard over the Columbia network.

A dozen teams of American researchers from different universities are now working on cosmic ray studies, Dr. Liddel reported. These studies are being supported by the Office of Naval Research and the Atomic Energy Commission.

Big problem of measuring the cosmic radiation is the fact that it varies both at different locations on the earth and at different altitudes above the earth, the scientists explained.

Because of this, cosmic ray scientists climb mountains, carry their ray counting instruments in airplanes and send the instruments aloft in balloons and rockets.

Goal of this extensive research is more knowledge of the atom, and of powerful cosmic ray particles of much higher energy than can be produced in any man-made atom smashers. Top energy for a proposed atom smasher is 6,000,000,000 electron volts. Cosmic ray particles have been found with energies of 1,000,000,000,000 (a million billion) electron volts.

"Our studies play an important role in our acquisition of new knowledge of the atom and our campaign to learn more about the peacetime applications of nuclear energy," declared Dr. Liddel.

Science News Letter, May 7, 1949

IN SCIENCE

TYPOGRAPHY

Design No-Contact Printing With Electrical Charges

➤ A REVOLUTIONARY system of printing in which no contact or pressure is used in transferring the ink to the paper has been demonstrated.

The process developed by W. C. Huebner of Huebner Laboratories, New York City, uses positive and negative electrical forces for printing, with the paper and inked image separated by perhaps a thousandth of an inch.

This printing system is called Onset by its inventor and uses what is called an electronographic press. It can be used with any of 32 different printing processes, printing one or both sides of the paper in one to six colors, Mr. Huebner reported.

Because no pressure is used in the printing process, it is suggested that less expensive paper can be used in printing with the Onset system. Smoother printing with better plates yielding finer illustrations and texts are claimed for the new process.

Science News Letter, May 7, 1949

ENGINEERING

Ultramatic Drive for Autos Eliminates Gear-Shifting

➤ DETAILS of the new "ultramatic drive," which will be optional equipment on cars, were revealed by the Packard Motor Car Company in Detroit, which is now celebrating its golden anniversary. One engineer pronounced it the closest approach to the engineering ideal of no transmission at all.

This "no-shift" device is said to be unlike any other in the automobile industry. It is unique in that it utilizes a torque converter for acceleration and positive mechanical drive for cruising. When a driver presses hard on the accelerator, the unit does not automatically shift into positive drive, the direct connection between engine and rear wheels, until 55 miles an hour. If he releases pressure momentarily at any point between 15 and 55 miles an hour, the unit shifts at once into direct drive.

Direct drive means no wasteful slippage because the torque drive "goes along for the ride" while the engine directly powers the rear wheels, a company engineer stated. The Packard torque drive is simpler than any other now being produced, he said, and contains fewer parts. The ultramatic drive he claimed to be simple, smooth, thrifty and quiet, yet more responsive, more positive and more flexible than any other automatic transmission yet produced.

Science News Letter, May 7, 1949

CE FIELDS

METEOROLOGY

Heated Rocks May Give Better Radioactivity Test

► ENERGY from exploding atoms accumulated over millions of years can be stored in the earth's rocks and released usefully in a rush through a phenomenon explained to the National Academy of Sciences in Washington.

Thermoluminescence, which is a giving off of light when material is warmed up, may also give a more sensitive test for radioactivity than a Geiger counter, Dr. Farrington Daniels of the University of Wisconsin explained in a paper prepared jointly with Drs. Charles A. Boyd and Donald F. Saunders.

Many rocks and minerals exhibit this property due to radioactivity through the ages caused by traces of the atomic energy elements, uranium and thorium. Dr. Daniels suggested that it might be possible to detect these elements through this method even when they were present in less than one part in a million.

During the war radar images were stored on fluorescent mineral screens and made to appear when desired by heating them up by infrared "black" light.

Rhythms of heating deep in the earth's crust could be caused by trapped and stored radioactivity being released quickly by heat. This promises to give geologists a new way in which some rocks of the earth could be formed.

Science News Letter, May 7, 1949

GENETICS

Effects of Radiation on Offspring Called Insidious

► ATOMIC warfare in this generation would not necessarily be productive of cripples, blind children and other hereditary defectives in future generations, declared Prof. H. J. Muller, Nobel prizewinner now on the faculty of Indiana University.

Effects would probably be much more insidious, and correspondingly more difficult to recognize and analyze. They might take the form of intense nervousness, abnormal vitamin requirement, or a tendency to develop such diseases as rheumatism, he stated. In the end, the affected human stocks would tend to die off through failure to reproduce.

Prof. Muller was a guest of Watson Davis, director of Science Service, on Adventures in Science heard over the Columbia network.

Based on the number of defective genes originating in easily observed laboratory

animals, such as fruit-flies, Prof. Muller prophesied that after a genetically effective dose of radiation such as might be produced by an atom-bomb, "among all the descendants of 20,000 parents so exposed, about 1,000 would in the end be killed genetically, and, along the way, several thousand, though not killed, would have been more or less hampered."

He pointed out also that such a dose of rays from an atom bomb would reach, not 20,000, but probably several hundred thousand people if the bomb were exploded over a large city.

Not only that, but X-rays and similar radiations now used for medical effect, sometimes directly on the reproductive organs themselves, are often well in excess of the quantity required to produce these undesirable hereditary consequences.

Among persons other than doctors' patients who are exposed to possibly genetically harmful doses of X-rays Prof. Muller mentioned X-ray operators, industrial workers, shoe salesmen and their customers, and some scientists. In the government's atomic radiation laboratories and other installations, he added, great care is used to keep exposure well below the danger point.

Science News Letter, May 7, 1949

GENERAL SCIENCE

Americans and Canadian Honored by Academy

► A CANADIAN scientist and three Americans were honored by the National Academy of Sciences at its annual dinner in Washington.

Dr. Frank McLearn of the Geological Survey of Canada was awarded the 1948 Mary Clark Thompson gold medal and honorarium. A. L. Wright, senior scientific officer of the Canadian Embassy, accepted the award on behalf of Dr. McLearn who was unable to be present. The medal was conferred in recognition of Dr. McLearn's contributions to geology and "to an important scientific organization in a friendly neighboring country."

Scientific achievements ranging from pioneering work in the study of the upper atmosphere and in fields of nuclear physics to the development of the proximity fuse were cited in the presentation of the Cyrus B. Comstock Prize for 1948 to Dr. Merle A. Tuve, director of the department of terrestrial magnetism of the Carnegie Institution of Washington. The prize is \$3,500.

The Academy's public welfare medal for 1948 was awarded to Dr. George H. Shull, emeritus professor of botany and genetics at Princeton University, for his work as an originator of hybrid corn.

Prof. S. A. Mitchell, for more than 30 years director of the Leander McCormick Observatory of the University of Virginia, was presented the James Craig Watson gold medal and honorarium for distinguished services to astronomy.

Science News Letter, May 7, 1949

MEDICINE

Humans May Benefit from Diet Cure of Rat Drunks

► SOME rats, given a chance, become alcoholics, just like humans. Others remain total abstainers. In some of the rat drunks there is a hereditary factor. They can be cured by suitable diet. "Shotgun" diet treatment of human alcoholics, therefore, could be expected to cure them of their craving for drink.

This, in brief, is what Prof. Roger J. Williams of the University of Texas told members of the National Academy of Sciences meeting in Washington.

The rat studies, by himself and his associates, L. Joe Berry and Ernest Beerstecher, were carried out to obtain evidence for a theory which Prof. Williams believes accounts for alcoholism, mental diseases, heart and blood vessel disorders, allergies, arthritis, multiple sclerosis "and even cancer."

The theory is that some people are born with a disturbance of body chemistry conducive to the development of "crucial deficiencies." As a result, even when eating a diet adequate according to nutritional standards, they are not getting enough of certain nourishing elements for their particular needs. And as a result of this deficiency, various diseases may develop.

Prof. Williams calls his theory a "concept of genotrophic disease."

"Geneto," he explains, refers to genetics, and "trophic" refers to nutrition.

"A genotrophic disease (of which we believe alcoholism is an example) is," he stated, "one arising from nutritional deficiency which in turn has its basis in a genetically controlled augmented requirement for one or more specific nutritional elements."

Science News Letter, May 7, 1949

METEOROLOGY

Man-Made Weather Used In Testing Equipment

► MAN-MADE tropical weather, as well as polar weather, is now available at the Army Signal Corps base in Fort Monmouth, N. J., to test instruments, equipment and clothing for use in extreme climatic conditions. The new tropical chamber simulates humid jungle and can sustain a maximum temperature of 190 degrees Fahrenheit and 100% humidity.

Because of the tropical room's proximity to the Signal Corps arctic chamber, where man-made snowfalls can be produced in a matter of minutes, it is now possible to subject materials to both extremes of temperatures with minimum time. Together they will help the Signal Corps develop and test the performance of signal equipment under conditions that might be encountered anywhere in the world.

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