ENGINEERING

Ultraviolet Light Makes Plane Instruments Glow

➤ THE USE of "black light" from fluorescent mercury-vapor lamps to make the luminous or fluorescent dials of aircraft instruments glow, with no apparent visible light in the cockpit, is reported by Maj. A. D. Dircksen, of Materiel Command, Wright Field (*Electrical Engineering*, July).

The radiation used for this purpose is in the near-ultraviolet region below the visible portion of the spectrum. A dense ultraviolet filter cuts out nearly all trace of visible light. This use of fluorescent lamps for lighting aircraft instruments was developed by the Engineering Division, Wright Field, in cooperation with lamp manufacturers. The lamps are mounted between the pilot and the instrument panel and directed so that none of the direct rays of light reach the pilot's eyes. He sees only the glowing instruments. The almost complete darkness of the cockpit improves the pilot's ability to see at night. Reflection of light on the windshield is practically eliminated.

For this new use of fluorescent lamps, the lamp industry developed a 24-volt direct-current blue fluorescent lamp for operation directly from the aircraft electric system, doing away with heavy vibrator equipment usually attached to fluorescent lamps. An iris-type shutter makes it possible to reduce the light from 100% to zero and by rotating the filter it is possible to select visible light or the "black" near-ultraviolet.

A portable fluorescent lamp, attached to a headband, has been developed for use of the bombardier when using the charts, bombing tables and bombsight.

The new fluorescent lamps provide uniform floodlighting that is not detectable by enemy aircraft with less weight and power consumption than for any lighting system used before by the Army Air Forces, Major Dircksen said.

Science News Letter, August 26, 1944

OCEANOGRAPHY

Plant Pigments Found In Ancient Sea Mud

➤ CAROTENE and related yellow plant pigments, of relatively complex structure, have been found in measurable quantities, undecayed, in sea-bottom muds of varying ages estimated from as little as 15 years to as much as 8,000 years, Prof. Denis L. Fox of the Scripps Institution of Oceanography states (*Science*, Aug. 11). Prof. Fox terms them "biochemical fossils."

These yellow compounds have come into prominent notice in recent years because of their importance in the formation of vitamin A.

Possible sources for the pigments in the sea sediments include the larger seaweeds and microscopic one-celled aquatic plants.

Science News Letter, August 26, 1944

STATISTICS

Pre-Election Test of Voters' Intelligence

➤ AMERICAN voters have taken a pre-election test of their intelligence. Not all the 60,000,000 were examined, but a representative sample selected in the same way people are picked for Gallup polls.

They passed—with scores corresponding to a mental age of 16, which is just about what yours is if you are an average, normal American. About one-third (31% to 33%) would be in the upper half of a class of college freshmen in intelligence. Results of the test are reported by Dr. Robert L. Thorndike, Columbia University psychologist, and Dr. George H. Gallup, (*Journal of General Psychology*).

Women voters are just a trifle more intelligent than are men voters, and young voters in their twenties are somewhat more intelligent than their elders who are over 60. Those who voted for Willkie in 1940 average somewhat higher in intelligence than do those who cast their ballot for Roosevelt—a small difference attributed to the difference in socio-economic level. Those who failed to vote for either of these candidates scored lower than did their supporters.

The test given was a 20-word, steeply graded vocabulary test, and did not, the investigators point out, measure other phases of intelligence.

Results of this intelligence survey of the American voting public give a much brighter picture than the first assay of U.S. adults, the Army testing of white drafted men in 1917. The mental age of that group was determined to be only 13 years. That group, however, was not representative of either the total adult population or of voters. At the lower end, many defectives and illiterates were probably excluded but it is believed that the upper end was also thinned out by the exemption of married men, volunteers, and those in essential war jobs.

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IN SCIEN

ENGINEERING

Turbine-Driven Cargo Ship Needs Huge Reduction Gear

See Front Cover

➤ REDUCTION from the whirlwind speed of a ship's turbine to that of its slow propeller requires gears like that shown on the front cover of this SCIENCE NEWS LETTER. This giant, called by workers the "mainspring," is 14½ feet in diameter and contains more than 400 parts machined to tolerances of thousandths of an inch.

The 58-ton gear, used on C-3 cargo ships, requires an entire flatcar for shipment. The photograph shows it being prepared for assembly at the Warren City Manufacturing Co., in Warren, Ohio.

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ENGINEERING

New Evaporator Distills Heat-Sensitive Materials

➤ A NEW TYPE of evaporator that uses infra-red radiation as a heat source was described by J. Arthur Reavell, at a meeting of the Institution of Chemical Engineers in London. It is claimed that the infra-red evaporator is a quicker and cheaper method of evaporating and distilling such heat-sensitive materials as blood serums and penicillin.

The material, usually a liquid, to be treated is put into an evaporating or distilling tube made of silica or special glass through which infra-red rays can pass. Infra-red heat lamps, such as are used by athletes for baking out muscular knots, are placed outside the tube.

The liquid inside the tube absorbs the infra-red rays. These are turned into heat within the liquid, the tube itself remaining comparatively cool. This system does away with the ill effects caused by the hot tube wall coming in contact with the liquid, as in heating over a flame.

Another important advantage of this new method of evaporation and distillation is that the necessity of using a high vacuum when working with materials which are very sensitive to heat is eliminated.

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CE FIELDS

BOTANY

Mold That Lives in Soil Bites Insect for Food

➤ WHEN AN INSECT bites a plant, that isn't news—as any weary, bug-bedeviled Victory Gardener can tell you. But when a plant bites an insect, that's at least interesting.

That is just what one plant, a lowly mold that lives in the soil, does to insects, Dr. Charles Drechsler of the U.S. Department of Agriculture has discovered. The fine threads of the mold, crisscrossed into a fused network, send up little finger-like columns that ooze sticky liquid at their tops. Small wingless insects, of the primitive order known as springtails, get caught on this natural tanglefoot. The mold then sprouts new filaments that grow into the victim's body, sucking it empty of anything that may be nourishing to the hungry plant.

Dr. Drechsler suspects that there may be other insect-eating molds. A number of mold species are already known that prey on small worms in the soil.

The newly discovered carnivorous mold species has been given the botanical name *Arthrobotrys entomophaga.* Expanded into English, that means "jointed cluster that eats insects."

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PHYSICS

Smoke-detecting Apparatus For Fire-warning at Sea

➤ PHOTOELECTRIC smoke-detecting apparatus now provides for ships at sea the same fire-warning system that is installed in many modern buildings.

The new apparatus, (*Electronics,* July), draws samples of the air from over 30 different parts of the ship, through individual pipe lines to the fire-detecting cabinet, which is usually located in the wheelhouse.

When the air enters the detecting cabinet it is first run into a long tube for photoelectric observation. Only one sample of air from one of the individual pipe lines is examined at a time. If no smoke is present, the air is released into the wheelhouse.

Smoke on the other hand, causes an alarm to sound and indicates automatically the source.

As a further check, the smoke sample is released into the wheelhouse, so that if the electronic device should fail, for some reason, to detect the smoke, it can be detected by smell.

Controls on the new fire-detecting system, developed by Walter Kidde and Company, can be adjusted to compensate for dust on the lens, mirror or glass surface of the photoelectric cell. This dust, if not compensated for, might affect the system in the same way that smoke does and thus might cause a false alarm.

Science News Letter, August 26, 1944

ORNITHOLOGY

Carrier Pigeons Do Not Require Special Diet

➤ CARRIER PIGEONS, much used in both Army and Navy, don't have to be pampered with special diet; they'll do their hazardous work just as well on the avian equivalent of regulation GI rations, it has been demonstrated in tests at the New Jersey Agricultural Experiment Station.

Among pigeon breeders there has long been a belief that to get the birds to come home promptly they must be expecting a meal containing things especially tasty to pigeons—expensive ingredients, that sometimes have to be imported.

To test this notion, the experimenters here fed two similar groups of birds on contrasting diets. One got the feed that the fanciers recommended, the other an ordinary squab-raising ration. Results showed no material difference in speed, number of birds returning on the same day, number late and number lost.

Science News Letter, August 26, 1944

INVENTION

Pontoon Stretcher Perfected For Use in Deep Water

➤ WHAT might be termed a pontoon stretcher, to enable medical corpsmen to get seriously wounded men over water too deep to negotiate with ordinary hand-borne stretchers, is the invention offered by A. N. Spanel of Princeton, N. J., for patent 2,355,757. The stretcher itself is of conventional pattern, but attachable under each end is a collapsible, cylindrical float of airtight fabric construction. When not in use, the collapsed floats can be carried in pouches slung over the corpsmen's shoulders.

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HORTICULTURE

Special Peaches Bred For Persons with Ulcers

➤ SUFFERERS from gastric ulcers and other stomach troubles who have been forbidden acid fruits by their physicians can at least enjoy peaches, thanks to a 15-year breeding program at the New Jersey Agricultural Experiment Station in New Brunswick, now just reaching a successful conclusion.

Working in cooperation with a Trenton physician, the plant breeders discovered that ulcer patients could eat raw peaches without ill after-effects if their acid content was low enough. So they started a project for the production of special low-acid peach varieties that combined other desirable qualities of flavor, size, productivity and hardiness. Now there are no less than 23 good peach strains, ripening in different seasons, that are considered suitable for this purpose.

The peach breeders have also been hard at work on "regular" peach varieties. A total of 53 new kinds, both yellow- and white-fleshed, ripening at evenly spaced intervals from mid-July to the end of September, are announced as practically ready for general introduction.

Science News Letter, August 26, 1944

ORDNANCE

Mortar "Powder" Comes in Celluloid-Like Sheets

➤ POWDER for the Army's mortars isn't really a powder at all. It comes in thin, flat sheets that look a good deal like opaque celluloid, that are stitched together on ordinary sewing-machines in one stage of their manufacture at the Radford Ordnance Works, Radford, Va.

The sheet "powder" that serves as a propellant for mortar shells has nitrocellulose as its base. It is "souped up" with nitroglycerin, and several modifying agents are added.

In its semi-finished form, the propellant looks like blotting paper. Rolled thinner, it takes on the sheet-celluloid appearance. These are stitched together and then cut into accurately measured squares, each with a hole through its middle.

For each caliber and weight of mortar shell, a particular thickness of sheet is required, and each square must meet a weight requirement with very narrow tolerance limits. This is to insure uniform burning rates, which in turn make for accurate adjustment of fire.

Science News Letter, August 26, 1944