PHYSICS

Atomic Energy Use for Hot Liquid Metals

➤ A PREVIEW of some of the hottest handleable liquids in the world—some of them metals that become liquid at more than a thousand degrees Fahrenheit—that might be used in atomic energy power plants has been issued by the Atomic Energy Commission and the U.S. Navy.

Some of the metals surveyed in a new liquid metals handbook are familiar ones in solid form: Aluminum, lead, magnesium, tin and zinc. One is usually seen as a liquid: mercury. Others less familiar are: Antimony, bismuth, cadmium, cesium, gallium, indium, lithium, potassium, rubidium, sodium, and thallium.

Now used in carrying heat to kettles in which chemicals are manufactured, reheating steam in power plants, and controlling mold temperatures, liquid metals would be one method of carrying the heat from the atomic reactors to engines where it could be used for power generation.

Science News Letter, August 26, 1950

ENGINEERING

New Subway Cars Have Constant Lighting

➤ LIGHTING for New York City's newest subway cars and the lighting system installed in the new Brooklyn-Battery traffic tunnel, which connects the city proper with Long Island, were described to the Illuminating Engineering Society meeting in Pasadena, Calif. Both are noteworthy installations.

Fluorescent lighting with the lamps operated on an uninterrupted alternating current, instead of on direct current from the third rail as now done, is the important feature in a new subway train in experimental use. The system employed is a development of Westinghouse Electric Corporation, and its features were described by E. W. Beggs and H. W. Graybrook, of Westinghouse.

Fluorescent lamps were developed for operation on alternating current, they said, and they operate more efficiently on it than on direct current. To obtain the alternating current from the direct current that operates the driving motors of the train, motor-alternators are used in each car.

But gaps in the third rail system that delivers the power to the train presented a difficulty. The track layout of the New York subway requires frequent gaps in the third rail. They provide interruption of the power to each car about 35 times per operating hour.

This difficulty was overcome in the new cars by adding flywheels to the motor-alternators. The inertia of the flywheel provides power to keep the lamps lighted across the longest gaps in the system.

Many features of the lighting system of the Brooklyn-Battery tunnel were described by Leo Geenens of the New York Triborough Tunnel Authority and Kirk M. Reid of General Electric. The lighting system comprises over 36,000 linear feet of luminaires.

To aid the lighting, side walls and ceiling have a white-tile finish and will be kept well washed. Important is a "daylight" entrance lighting that extends 1,800 feet in each tube. From bright lights in the first 400 feet, lighting is scaled downward through the rest of the 1,800 feet to provide easier adjustment of the driver's eyes.

Science News Letter, August 26, 1950

WILDLIFE

Drumming's New Method For Counting Grouse

➤ THE DRUMMING of the ruffed grouse, one of the most unusual sounds in nature, is being used experimentally as a census technique by the North Dakota Game and Fish Department.

In the past, the ruffed grouse census has been taken in the fall of the year by walking several miles in a number of study plot areas and recording the number of birds actually seen.

At present a roadside count method is being tried by driving a mile, stopping four minutes, and recording all drumming heard. The drumming sound can be heard for approximately a half mile and seems to be consistent from before sunrise to one to two hours afterward. So far this new technique has worked out very successfully.

The "drumming" sound for which the ruffed grouse is noted is not vocal but is produced by rapidly whirring wings in the air.

Science News Letter, August 26, 1950

VETERINARY MEDICINE

Pigs with Dished-In Faces Infectious to Other Pigs

➤ IF your pig has a dished-in face, off to the isolation ward with him. His ailment is infectious.

The peculiar disease which gives pigs this caved-in appearance is known as *atrophic rhinitis*. It causes certain bones in the face to disintegrate. Few pigs die from it, but it retards their fattening. Veterinarians know little about it.

Two Canadians, Drs. F. W. Schofield and T. L. Jones of Guelph, Ontario, say they have proved the disease is catching, however. They have not yet identified the infectious agent, they report in the JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION. But they say that isolation of infected pigs helps control outbreaks.

Science News Letter, August 26, 1950

IN SCIEN

METEOROLOGY

Most of Nation Warmer Until Mid-September

➤ EXCEPT for the South Atlantic states and the Pacific Northwest, the country is in for warmer than normal weather until mid-September. The U. S. Weather Bureau's extended forecast says the South Atlantic states will have near normal temperatures and the Pacific Northwest will be slightly below normal.

Those above normal temperatures, at least in the eastern half of the country, will be accompanied by less rain than usual for the mid-August to mid-September period. The below-normal rainfall will extend to the South Atlantic states, too.

Most of Washington, Oregon and New Mexico will enjoy greater than normal rainfall, while the rest of the country will see rainfall in about the usual amounts for the same period.

The long range forecasters add that in most of the area from the plains eastward to the Appalachians, the weather from Aug. 15 to Sept. 15 should be warmer and drier than it was during the previous 30 days.

Science News Letter, August 26, 1950

AVIATION

Improved 'Chute Webbing Makes Jumping Safer

➤ IMPROVED webbing for parachute harness, developed at the Wright-Patterson Air Force Base, will make jumping safer and will save much money to the government because of the long life of the improved material.

The material is nylon webbing which has been treated with a resin, polyvinylbutyral. The resin does not penetrate the nylon fibers of the webbing, but it acts somewhat like an adhesive to prevent the fibers from separating and the webbing from fraying.

In the treatment process, the ribbon-like strands of nylon webbing strips are dipped into a water solution of the resin, commercially known as Merlon-BR, which has been dispersed in a wetting agent known as Duponal. The strips are then run through rollers similar to those on an ordinary washing machine. Excess water is removed but, more important, the resin is pressed into the webbing.

After drying in an oven, the strips are ready to be stitched into a harness for the parachute. The treated webbing is stiffer than untreated material, but this is a definite advantage in its wearing qualities.

Science News Letter, August 26, 1950

CE FIELDS

CHEMISTRY

Devices Give Pure Salt-free Water

➤ PURE salt-free water from the tides of the Hudson River or the industrially contaminated Susquehanna can be drawn in either household quantities or for large-scale factory use by means of devices announced recently by the Rohm and Haas Co. of Philadelphia.

More thorough-going than the type of water softener that keeps scale-forming and bath-tub ring salts in solution, these devices take all dissolved material out of the water supply, by means of a series of artificial resins known as amberlites. Two kinds of resins must be used at the same time. The new development for their use on an industrial scale consists of a separation procedure for renewing their activity when they become clogged. The procedure floats the lighter resin to the top of the container for treatment. Afterward air is forced in to mix the two materials again for use.

For household use the mixture of resinous particles is packed in a plastic tube to be attached to the water faucet, and a color indicator incorporated in the material tells when it is time to discard the water conditioning chemicals and install a new cylinder. A medium-sized installation which will provide pure water for automobile batteries, or for photographic developers, is also offered with a built-in current indicator to keep count of the purity of the treated water.

Science News Letter, August 26, 1950

ENGINEERING

Wheat Pumped Through Pipes like Water

➤ IN THE BARN of tomorrow, throw a switch and open a valve. Dry grain will come out of pipes like water.

This is the promise of experiments by engineers at West Virginia University. Whole-kernel wheat was substituted for pulverized coal in a compressed air "fluidizer" and blown through tortuous lengths of one-inch piping both efficiently and economically.

Air fluidization is a principle by which powdered coal and other finely-divided solids have long been moved through small pipes.

The same principle now makes conceivable an entire farm piped for push-button feeding of livestock and poultry. Results of initial tests are reported by Dr. Alfred D. Longhouse and D. P. Brown, agricultural engineers, and Dr. Howard P. Simons and C. W. Albright, chemical engineers, in the technical journal AGRICULTURAL ENGINEERING.

Their studies were begun with borrowed coal equipment. Wheat was fed into the top of a tall, narrow cylinder. Compressed air was pumped in at the bottom. Fluidized grain was taken out a discharge pipe at the middle of the chamber.

Using air at only five pounds per square inch above atmospheric pressure, the researchers found that a ton of wheat an hour could be moved through a one-inch pipe 75 feet long. The delivery line had three right-angle corners and a U-turn in it.

Power required by the air compressor was less than three-eighths of one horsepower. By weight, one pound of air moved 20 pounds of grain. Even greater efficiency may be obtained if ground grain is fluidized in the same manner, the engineers say.

Science News Letter, August 26, 1950

PSYCHOLOGY

New Theory of Sense of Smell

➤ A NEW theory of how the sense of smell works has been developed by Dr. G. B. Kistiakowsky of Harvard University (SCIENCE, Aug. 4).

Odors work through enzymes, he believes. Enzymes are a class of chemicals which can produce the transformation of other chemicals. Many vital body processes go on through the mechanism of enzymes. Pepsin, a digestive enzyme, is one familiar example.

You get the odor of a chemical because it changes the concentration of one or more enzymes. The change in enzyme concentration produces a signal in certain nerves. The intensity of a smell is related, according to this theory, to the extent to which the enzymes are checked or blocked in their action.

The persistence of certain odors may be due to a non-reversible change in the blocking of enzymes, though most of the enzyme blocking is reversible.

Science News Letter, August 26, 1950

PHYSICS

Radio-Frequency Circuits Shed Light on Atom

➤ A NEW use for radio-frequency circuits is to determine the magnetic properties of the atom. Since atomic particles spin and carry electric currents they behave like small magnets.

Dr. Felix Bloch, professor of physics at Stanford University, reports new developments in the study of nuclear magnetism in the journal, PHYSICS TODAY (Aug.).

Placing these invisible magnets in an alternating magnetic field gives rise to electric forces which can be measured by short radio waves. New information about the structure of matter has been discovered by varying the electric and magnetic forces to which atomic magnets respond, and measuring the time necessary for their response.

Science News Letter, August 26, 1950

PSYCHOLOGY

Flicker Frequency Found Related to Intelligence

➤ INTELLIGENCE may some day be measured by a flickering light instead of with the conventional paper-and-pencil mental tests.

The length of the dark period between flashes of light necessary for you to see the light as flickering and not continuous is determined by your central nervous system and not by your eyes.

New evidence of this is reported by Dr. Wilson P. Tanner, Jr., of the University of Michigan (SCIENCE, Aug. 18). He found that this "flicker frequency" is related to scores on intelligence tests. It may be possible in the future to measure ability to see light as flickering, instead of giving a paper-and-pencil test to measure intelligence, Dr. Tanner suggests.

A surprising discovery in the course of the experiment was the fact that the relation with intelligence varies with the length of the light flashes separated by the periods of darkness. It increases with increase in the length of the light flash, up to 84 thousandths of a second, and then decreases with further increase of the length of the light flash.

Science News Letter, August 26, 1950

NUTRITION

Vitamin Lack Kills Hens When They Start Laying

➤ IT IS not heart trouble that causes the non-infection deaths of hens about the time they start laying, but this loss to poultrymen may be linked to a deficiency of vitamin B_1 or potassium.

After a whole year of taking electrocardiograms of hens, which involved working out new methods, Dr. Paul David Sturkie, Rutgers professor of poultry physiology, found that heart ills killed only about 2½% of the normal hens, compared with about 25% deaths from unknown causes.

In another study, artificial diets lacking in vitamin B_1 and potassium did produce heart abnormalities in hens. Lack of vitamins A, D and G did not affect the heart, while too much potassium did.

Prof. Sturkie is now beginning a study of the blood pressure of hens as the next step toward solving the cause of this major loss in the poultry industry. Since the pulse rate of chickens is 300 to 400 a minute, too fast to count, electronic counting methods had to be developed.

Science News Letter, August 26, 1950