

ENGINEERING

Air Bubbles Improve Quality of Concrete

► NOW AIR BUBBLES are trapped in concrete to improve its quality, Charles E. Wuerpel, of the Army Waterways Experiment Station, Vicksburg, Miss., told the American Society of Civil Engineers.

Air bubbles in concrete are purposely created by the addition of pine resins, animal or vegetable fats and oils, and other saponifiable matter to the cement or at the concrete mixer. The process is known as air-entrainment.

"Widely dispersed spheroids of air in concrete," he continued, "will increase the resistance of the hardened mass to frost action and to chemical action by salts used for de-icing pavements far beyond that achieved with non-entraining concrete."

Pavement concrete for highways has been treated in this way, and facts gathered now show concrete used in buildings and other structures can benefit from the process.

These purposefully-created bubbles are explained as an additional aggregate, like sand, stone, gravel or slag, but they possess flexibility of shape. He stressed their advantage over rigid angular and sub-angular grains of sand or cement that can not accommodate themselves to the movement of other grains. The improvement in uniformity of bond completely offsets the possible slight reduction in bond strength, he argued.

Science News Letter, October 26, 1946

WILDLIFE

DDT Kills Mosquitoes Without Harming Fish

► DDT IN MIST-FINE sprays loosed from airplanes over the man-made lakes in the Tennessee valley was effective in killing the mosquitoes it was aimed at, but did no material harm to the fish in the lakes or to the small, water-inhabiting animal forms on which the fish feed.

This was discovered in tests by Dr. A. D. Hess and G. C. Keener, Jr., TVA biologists, during the season just closed.

In over-all effect, the malaria-bearing anopheline mosquitoes were almost completely wiped out, and the culicine mosquitoes, that merely annoy by biting, were significantly reduced in numbers. Some other insects, notably surface-skimming bugs and beetles, were seriously affected. Some of the surface-feeders, especially the waterstriders, are carnivor-

ous, competing with fish for food, so that their elimination may be a gain rather than a loss.

Principal animal food of fishes consists not of insects but of small crustacea—tiny, wiggling relatives of crayfishes. On these the DDT had very little effect.

The two biologists caution that their conclusions are based only on the dosage and application method used. Harm might result, they state, from heavier dosage and different application methods.

Detailed results of their investigations will be published in the *Journal of Wildlife Management*.

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ENGINEERING

Lightweight Truck Bodies Will Be Available Soon

► TIRES THAT ROLL 100,000 miles, and lightweight bodies for commercial vehicles that contribute to speed and economy, will be available when the automotive industry gets into high-speed gear again. The tires are now being produced, and lightweight truck bodies have passed the experimental stage.

The 100,000-mile tire already is available, Ben Sorci of Chicago told the Society of Automotive Engineers in Chicago. To get this wear, proper maintenance is essential, of course. Under present methods of operation the average truck owner gets no more than 50% of the mileage actually built into tires.

Approximately 25% more mileage for tires on motor trucks with aluminum bodies, as compared with conventional heavy bodies, can be expected, J. H. Dunn, of the Aluminum Company of America, declared at the same meeting. Also, 10% less fuel is required for such trucks and there is a 10% step-up in acceleration. Magnesium is eminently suitable for truck bodies, he said. In addition to tire and fuel saving, lightweight bodies built either of aluminum or magnesium provide economy by their resistance to corrosion.

Records were presented by F. O. Lewis, of Dayton Power and Light Co., which show that large increases in miles-per-gallon of fuel, and large decreases in operating costs resulted with aluminum-body trucks. The saving in license fees alone, he said, more than offsets the higher cost of aluminum over steel, or wood-and-steel bodies.

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IN SCIENCE

AGRICULTURE

Dehydrated Potatoes May Substitute for Corn

► DEHYDRATED POTATOES that didn't make much of a hit with many GI's during the war may be used as a substitute for corn—in feeding sheep.

The moisture-removed spuds being fed sheep in tests at the North Dakota Agricultural College Experiment Station are low-grade potatoes that the industry has trouble disposing of profitably. Results of the experimental feeding last spring indicates that potatoes are 73% as effective as a corn diet, but with additional protein and minerals, the dehydrated product can be used as a substitute for corn.

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MEDICINE

Allergy May Prevent Wounds from Healing

► ALLERGY is now a suspect in surgical and other wounds that heal too slowly.

This is indicated in a case report by Dr. Albert H. Rowe, University of California physician, in the *Western Journal of Surgery, Obstetrics and Gynecology* (Oct. 19).

In the case reported by Dr. Rowe, the first of its kind in medical literature, the patient's wound healed within three weeks after his allergy symptoms had been treated successfully.

The wound had remained unhealed for two-and-a-half years after an appendicitis operation. A glistening, thin, reddish membrane had formed over the wound two months after operation, and it exuded a bloody discharge every two or three weeks.

Dr. Rowe found that the patient had suffered from life-long cramping abdominal pains and indigestion, signs of gastro-intestinal allergy.

Treatment consisted of a fruit- and cereal-free elimination diet, which relieved the allergy symptoms. The wound has remained healed for over two years.

Dr. Rowe suggests that chronic allergy should always be given consideration in wounds that fail to heal properly.

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E FIELDS

MEDICINE

Distribution Process Separates Penicillins

► **PENICILLINS** are not merely four, as at present recognized and labeled, but "innumerable," Dr. Lyman C. Craig of the Rockefeller Institute for Medical Research told members of the American Chemical Society in New York.

Separation of these hundreds or thousands of still-unknown types of penicillin, and study of their potencies, will not depend on the time-consuming determinations of their individual boiling-points or melting-points hitherto in use, but on a new method, which the speaker called "counter-current distribution."

This system is partly physical, partly mathematical, the speaker explained. The procedure involves a system of multiple transfers of the substance under study through a series of separatory funnels so that the mathematics of the binomial theorem may be applied directly to the interpretation of the results.

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MEDICINE

Xenon May Become Useful as Anesthetic

► **ONE OF** the rarest of gases, xenon, which forms about one 170-millionth of the atmosphere, has possibilities as a new, non-explosive anesthetic, it is indicated by recently released University of California wartime research.

In "tracer" experiments with radioactive xenon, a group of researchers in the Aero-Medical Unit found that the inert gas has narcotic effects on human subjects as well as mice.

In addition to finding obvious physical anesthetic effects, the researchers took radio-autographs of mice fed radioactive xenon, and found that the gas had permeated the spinal cord and whole nervous system in the characteristic manner of anesthetics.

With the radio-autograph technique, the mouse literally takes his own picture after being sacrificed. Selected slices of tissue are placed on a photographic plate, and the radioactivity produces a picture similar to an X-ray, showing the distribution of the substance.

The anesthetic quality of xenon was discovered when the group of scientists were studying high-altitude sickness. In studying the effect of rare gases on human subjects, they received complaints of dizziness and numbness by subjects breathing a mixture of krypton and oxygen at atmospheric pressures.

This set the scientists on the following chain of reasoning: first, nitrogen, closely related to krypton and xenon in the inert gas family causes dizziness and numbness at high altitude, the reason being that it dissolves rapidly in the body in a rarefied atmosphere but not at sea level; second, xenon is much more soluble in the body than either krypton or nitrogen; third, therefore xenon might be anesthetic at sea level.

The reasoning proved to be correct, a mixture of 70% xenon and 30% oxygen producing in mice temporary staggering, stupor and paralysis.

Because xenon is extremely rare and no economical method is known of separating it from the air, detailed experiments could not be conducted on human subjects. This factor may also make it more difficult to develop the gas as a practical anesthetic.

The scientists said that while the effect of xenon alone is not enough to produce prolonged anesthesia, it may be possible to obtain such an effect by mixing it with another substance.

Dr. John H. Lawrence, assistant professor of medicine, performed the experiments with the assistance of Drs. H. B. Jones, C. A. Tobias, and J. G. Hamilton.

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ENGINEERING

Method of Testing Soil Strength Uses Piston

► **A METHOD** of testing the bearing-strength of the soil on a site proposed for an airfield was described by W. J. Turnbull of the Vicksburg station to the American Society of Civil Engineers. This California bearing ratio method, questioned by some engineers, is adopted by the Army Corps of Engineers "for reasons which were considered sound."

A three-square-inch circular piston is forced into the soil and the resistance to penetration is measured. This resistance is converted to a bearing ratio by comparing it to the resistance of a high-bearing material adopted as a standard.

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CHEMISTRY

Better Liquid Scrub Soaps To Reach Public Soon

► **MORE AND BETTER** liquid scrub soaps, despite the acute shortage of fats and oils, will soon reach the public, thanks to a new formula being widely adopted by soap manufacturers.

Ever since the government clamped down on putting edible fats and oils into the soap kettle, soap makers have been searching for more and more extenders and fillers to pad out their production. The new formula not only doubles the yield of liquid soap without increasing fat consumption, but it makes a better soap for cleansing and rinsing in hard water.

The essential chemical compound in the new liquid soap formula, as developed by the Rohm and Haas Co. of Philadelphia, is a synthetic wetting agent, alkylated aryl poly-ether sulfate. Given the trade name Triton X-300, the chemical is closely related to other synthetic organic compounds used in cosmetics, car washers, and soapless household cleaners.

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PSYCHOLOGY

Girls Start Outtalking Boys Early in Life

► **BABY GIRLS** utter more speech sounds than do baby boys. Boys and girls begin with the same number of phonetic sounds during the first year of life, but girls outtalk boys during and after the second year.

This discovery was made by Orvis C. Irwin and Han Piao Chen, of Iowa State University, from a study of 95 infants ranging in age from one to 30 months.

The scientists visited most of the babies in their homes twice each month during the first two and a half years of life. At each visit they recorded all sounds uttered by the infant on 30 breaths.

During the first two-month period of life the average baby masters 7.5 different kinds of sounds, the scientists report in the *Journal of Experimental Psychology*, (Oct.). Greater progress is made during the first year of life, they found, but its vocabulary at two and a half years includes 27 of the 35 sounds present in adult speech.

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