

CHEMISTRY

To Save Infertile Eggs With Carbon Dioxide

► TO KEEP infertile eggs fresh even at incubator temperatures is the object of U. S. patent 2,296,544, granted to George Franklin Stewart of Ames, Iowa. The rights have been assigned to Iowa State College Research Foundation.

When eggs are incubated, many of them turn out to be infertile. This can be recognized before the chicks are hatched and the infertile eggs removed. But meanwhile they have spoiled and must be thrown away. This spoilage can be so far prevented, the inventor finds, that the rejected eggs will still be suitable for human consumption.

The eggs soon after laying are placed in an air-tight container, the air in which is loaded with 10% to 15% of carbon dioxide—the soda-pop gas. This gas prevents deterioration but does not interfere with embryonic development. After exposure of from 20 to 30 hours to a temperature of 100 degrees Fahrenheit, the fertile can be distinguished from the infertile eggs. The latter are removed and sent to market, while the incubation of the others is continued until the chicks hatch.

Science News Letter, October 10, 1942

CHEMISTRY

Soybean Rubber Substitute, More Elastic Than Rubber

► A RUBBER-LIKE material that can be made from soybean protein or from other vegetable proteins is described in United States patent 2,296,464, granted to Robert Brown of New York, N. Y. The inventor claims that his material is more elastic than natural rubber and has great strength.

The beans are ground up and the fats and oils removed leaving only the protein. The protein meal is then mixed with water and quicklime, stirred, and finally a clear yellowish viscous liquid is filtered out. Chlorine gas is bubbled through it, and the liquid is then allowed to stand for about three days during which time coagulation or polymerization occurs.

At this stage, if the liquid is spread over a surface and dried by steam, a clear soft film is formed which, the inventor says, has many of the properties of rubber but is not highly elastic. Nevertheless it can replace natural rubber in a number of uses.

To increase the elasticity, carbon disulfide is added to the liquid, another

but shorter chlorine treatment is given, and another period of standing allowed. When the liquid is now spread over a surface and dried, a thin brown film is formed which, the inventor says, is considerably more elastic than natural rubber. It is also strong, he says, and entirely unaffected by fats, oils and greases, so that it is admirably suited for gaskets and the like.

The United States Department of Agriculture at its Northern Research Laboratory in Peoria, Ill., has been experimenting with substitutes derived from soybean oil and from corn oil, but has claimed a stretch of only about a third that of natural rubber. (See *SNL*, July 18)

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ENGINEERING

"Calling All Horsepower" Drive for War Begun

► THE ELECTRIC industry is "calling all horsepower," in the words of A. C. Streamer, Westinghouse vice president, in a letter issued following WPB suggestions.

Just as men can work and are working harder than usual during this war-time emergency, so can electric machinery deliver more than its rated power without damage. These ratings have always been conservative, said Mr. Streamer, not merely to avoid danger but to insure long life and low maintenance cost. The machines can be driven up to 25% above rated capacity without approaching the danger point, and save up to 40% of the copper, aluminum and steel used in their manufacture.

Customarily, to do a 1¼ horsepower job, a 1½ horsepower motor would be employed. If a one horsepower motor is substituted, which is perfectly feasible with an open-air motor, 36 pounds of vital war materials are saved. For higher powers correspondingly greater savings are made. Enclosed motors, however, can only be overloaded to 10% or 15%, Mr. Streamer said. Surrounding temperatures and other conditions must be considered in deciding the permissible overload.

Recommended also was the use of high-speed in place of low-speed motors wherever practical. High-speed motors are smaller and require less critical materials.

Alternating in place of direct current motors and higher voltages were recommended for the same reasons.

Control and protective equipment, he warned, should be carefully matched to the new requirements.

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IN SCIENCE

ENGINEERING

Ingenious New Method Determines Powder Sizes

► POWDER metallurgy, now coming into extensive use, requires that the sizes of the metallic grains, particularly the proportions of grains of different sizes that make up the powder, shall be accurately known. An instrument which does all this in 15 minutes as against eight hours previously required has been developed by Westinghouse Electric & Manufacturing Company.

A sample of the powder is shaken up in a long tube filled with acetone and the powder is then allowed to settle. The rate of settling depends on the particle size. Instead of waiting eight hours for the tube to clear, which incidentally gives no information about the powder composition, a beam of light passing through the tube is measured at intervals by an electric eye (photoelectric cell). This gives the opacity of the liquid, hence the rates of settling and the powder sizes.

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MEDICINE

First Aid Textbook Going To South American People

► CENTRAL and South Americans will soon be practicing splinting, bandaging and artificial respiration on each other; as we did in the United States last winter and spring, it appears from an announcement from American Red Cross Chairman, Norman H. Davis.

The gray American Red Cross first aid textbook, now familiar to millions of North Americans, has been translated into Spanish and Portuguese and will soon be available for distribution to all Central and South American countries, Mr. Davis said.

The translations will be made by the Mexican Red Cross and the Brazilian Red Cross with the permission of the American Red Cross, Mr. Davis said. Previously, distribution of the first aid textbook had been limited to Mexico and Venezuela.

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E FIELDS

PHYSICS

Static Electricity May Cause Fire or Explosion

► SPARKS CAUSED by static electricity are a fire and explosion hazard in many industries. The National Bureau of Standards has put out an easily read circular (C438), which describes the various causes and cures of this hazard. It can be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 10 cents.

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GENERAL SCIENCE

New World After the War Will Require Cooperation

► "IT WILL be a new world into which we will enter once this war is over, and in this new world we will have industrial problems which only industry can solve cooperatively."

These words were spoken in Colorado Springs before the American Institute of Steel Construction by Clyde G. Conley, president of the Institute.

The many new materials and substitutes developed during this period will not be quietly withdrawn at the end of the war, he said further, leaving the markets to the older industries which formerly dominated them. Safer and stronger steels, the economies and short cuts, which ingenuity and engineering skills have effected under the spur of war's exacting demands, should redound to the permanent advantage of the consumers of steel during the years ahead.

The structural steel fabricators have built the new factories in which are built more planes, tanks, guns, munitions and every kind of modern weapon. That program they have carried to a successful conclusion, he stated. Now they are asked to make "strange parts" to an accuracy many of them have never before attempted. This requires new tooling up, training of new operators and retraining of old ones. But these requirements are being met.

At the same time, strictest economy in the use of steel is demanded. Where-

ever possible substitutes must be employed, wood, cement, etc. And the steel must carry heavier loads. Fortunately, metallurgical improvements, Mr. Conley pointed out, insure more uniform steel, safer, stronger, which can safely bear the heavier loads.

All of the achievements of the structural steel industry during the past months cannot now be recounted, he said, but he assured his listeners that the record had been a glorious one.

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METEOROLOGY

Dust Storms in Egypt Have Increased Tenfold Since War

► DUST STORMS in the Egyptian desert are now occurring at the rate of one a week, adding a new complication to desert fighting. Before the war, desert dwellers had only sand storms to contend with, writes Dr. H. Heywood, of the Imperial College of Science and Technology (*Nature*, Sept. 5).

But due to war conditions, such as the construction of fortifications and movement of trucks and tanks, as well as the destruction of desert scrub by fleeing Bedouins, dust storms have increased from an average of five a year, before 1940, to a total of 54 last year.

The biggest single reason for such a change, according to meteorologists, is the destruction of desert scrub. While this was low and somewhat scarce, the roots extending several feet around each plant tended to hold the surface soil in place.

"I had regarded the term 'dust storm'" (reported every few days as interfering with Middle East fighting) "as being somewhat loosely applied . . . to include sand storms," writes Dr. Heywood, "but I have recently had the opportunity of reading a paper by Prof. F. W. Oliver which throws new light on this point."

For the past seven years, Prof. Oliver has lived at Burg-el-Arab, thirty miles west of Alexandria, close to Egyptian desert fighting. He states that extensive measures will have to be taken after the war, to combat the increasingly severe storms, and make these regions livable again.

As inhabitants of our own Great Plains area have discovered, there is no escape from a dust storm. It seeps through closed windows, filling your nose and throat with fine dust. And of course soldiers in the desert are apt to be completely unprotected from the driving dust winds.

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ORNITHOLOGY

Oldest Known Bank Swallow Seven Years Old Reported

► THE WORLD'S oldest known bank swallow, as aged at 7 years as a 115-year-old human, has been reported by Dr. Dayton Stoner, zoologist of New York State Museum, and his wife, Lillian C. Stoner.

With the average life-span of the bank swallow two to three years, this venerable bird breaks the previous record for longevity held by a six-year-old bank swallow, recovered by the Stoners in 1937.

The present record-holder proudly wears the date "May 27, 1936," with which he was banded as a yearling. That was six years ago, bringing his present age up to 7.

"In this species," say the Stoners, "there are no external differences between the sexes," but the evidence (discrepancy in weight between him and his mate) "strongly suggests that this individual is a male."

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ENGINEERING

Washing Machine Imitates Hand Laundering Method

► A WASHING MACHINE that handles delicate fabrics in much the same way that the lady of the house would if she were washing her things herself is the invention of Frank Breckenridge of Mansfield, Ohio, for which he has received U. S. patent 2,296,257. He has assigned the rights to Westinghouse Electric & Manufacturing Company of East Pittsburgh, Pa. But for the duration we shall probably have to get along with the old machine.

The special feature of the new machine is a circular basket turning on an inclined axle, so arranged that only a portion of it dips into the water of the tub at any one time. The flaring sides of the basket are perforated but the bottom is solid and corrugated. Vanes along the sides lift the fabrics from the water, as the basket slowly revolves, and drop them in again, but causing them to rub against the corrugated sloping bottom on the way, thus simulating the actual operations of hand washing.

Another feature of the machine is that after the water has been drained off the same basket can be rotated at high speed and the clothes partially dried by centrifugal force.

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