TECHNOLOGY

Plastic Balloons Solve Oil Storage Problem

➤ TINY PLASTIC balloons floating on top of a tank of crude oil may be the answer to one of the oilman's nightmares: evaporation.

The little balloons, which under a microscope resemble brown ping pong balls, have been created to stifle evaporation loss from large storage tanks. Filled with nitrogen gas, the phenolic resin balloons nudge each other into a tight, floating pack one inch thick.

This layer is sufficient to cut evaporation in oil storage tanks by as much as 90%, the Bakelite Company, a subsidiary of the Union Carbide and Carbon Corporation, reports. Whereas an unprotected, 55,000-barrel cone-roof storage tank loses about 1,880 barrels a year to evaporation, the pack of little plastic globules will cut the loss to about 320 barrels.

The yearly loss of oil due to evaporation is estimated to be worth $60,000,000. About four out of each hundred barrels of crude oil in storage evaporate into the air each year.

By creating a tight pack, the balloons, which are 0.0002 to 0.0036 inches in diameter, virtually seal off the oil from the air, making it difficult for volatile components in the oil to evaporate.

Science News Letter, December 5, 1953

CHEMISTRY

Antibiotics Unique In Chemical Build

➤ THE ANTIBIOTICS, so-called mold remedies, are as wonderful in their chemistry as they are in their disease-curing powers, Prof. Donald J. Cram of the University of California at Los Angeles declared at a sectional meeting of the American Chemical Society in Alameda, Calif.

Each of them, he said, has some peculiar arrangement of atoms that has not previously appeared in natural compounds.

Organic chemists were so unwilling to believe a natural, instead of man-made, chemical could have an arrangement of atoms called a "four-membered lactam ring," he stated, that research on the structure of penicillin was frustrated for well over a year, in spite of unprecedented efforts to elucidate it.

The discovery and investigation of the antibiotics gave a healthy boost, not only to the treatment of disease, but also to the field of organic chemistry, Dr. Cram declared. The novel discoveries and the violation of preconceived ideas connected with research on the antibiotics have influenced related fields of chemistry, and have imbued scientific investigators with greater freedom of imagination in their work.

Whole new fields of research have been opened up in the study of such products as fungicides and wood preservatives, and in such academic problems as how molecules are built and how they react toward each other.

"A tremendous stride in making cortisone more readily available was made when it was found that certain families of molds could carry out a chemical transformation in one step which, by ordinary chemical reactions, involved eight to 16 steps," said Dr. Cram. "It would appear to be only a matter of time before the capabilities of the molds and allied micro-organisms were found to include many more substitutes for ordinary organic synthetic procedures."

Science News Letter, December 5, 1953

PSYCHOLOGY

"Eisenhower" on Disk Makes It Appear Bigger

➤ HERE IS an interesting experiment: Place a white disk bearing the name "Eisenhower" on a wall. Then remove it and put up another disk, same size and same position, bearing a name picked at random from the telephone book.

Most persons will say that the "Eisenhower" disk was larger and placed higher on the wall than the other disk.

This is a test that was performed by Jesse Harvey at the University of California at Los Angeles for his doctoral thesis in psychology, performed under the supervision of Dr. Richard Centers.

It was an attempt to prove that visual judgment of size, elevation and color are not very reliable because they are often influenced by factors other than the physical properties of objects viewed.

Other studies performed at U.C.L.A. and elsewhere have indicated that poor children estimated the size of coins to be larger than children from well-to-do homes. Poker chips were judged to be larger if they were being used to represent money in a poker game than if they were not in use. A leaf-shaped piece of cloth was judged greener than a donkey-shaped piece of the same cloth.

Science News Letter, December 5, 1953

METEOROLOGY

Murky Skies Mean Snow—10,000 Feet Up

➤ WHEN THREATENING skies look like snow, even though your local Weather Bureau forecaster sticks to a prediction of rain, it may actually be snowing—10,000 to 15,000 feet above the ground.

High snow that melts as it falls, often evaporating before it reaches the ground, can cause the leaden skies that to an amateur mean "snow," I. R. Tannehill of the Weather Bureau in Washington states. It is usually about 40 degrees colder at 12,000 feet than at the surface, so even in summertime, on occasion, there can be snow high up that melts as it falls.

Science News Letter, December 5, 1953

IN SCIEN

ENTOMOLOGY

Insects Gain Ally In War on Grain

➤ INSECTS IN the United States have a new ally, the Khapra beetle, in their war against the nation's grain crops.

The beetle, *Trogoderma granarium*, has been found for the first time in the Western Hemisphere in Tulare county, California. Entomologists believe that its native habitat is India.

The Bureau of Entomology and Plant Quarantine of the U. S. Department of Agriculture reports that approximately 12,000 tons of wheat in two grain elevators are infested with the beetle. The wheat is of local origin and there is no record of foreign grain being stored in the elevators.

A serious storage grain pest, the Khapra beetle has been transported to most sections of Asia, Europe and Australia since World War I. The larvae of the insect feed on grain, principally wheat, barley, rice and oats.

A thorough survey is being made by department entomologists to determine the area infested with the beetles. Little is known of the beetle's habits or methods of control in this country.

Spokesmen for the Department of Agriculture indicate that the new insect is taken quite seriously. Investigators are trying to determine what eradication measures are practical.

Science News Letter, December 5, 1953

TECHNOLOGY

"Package Towboat" Sails In Water 2.5 Feet Deep

➤ A "PACKAGE towboat" that can be put together in water has been created in Nashville, Tenn., for the U. S. Army Transportation Corps to tug barges in extremely shallow inland waterways overseas.

The towboat's nine watertight sections can be unpacked, then floated out into the water where the boat is being bolted together. When assembled, the tug is 96 feet long, sports a beam of 24 feet, four inches, and operates in a draft of two feet, six inches.

Its three aft sections are engine rooms. They house three Caterpillar 337 engines that drive 36-inch propellers. The engines develop a total of 600 horsepower.

The unassembled towboat can be transported either by truck or rail and can be assembled in two days. It was created at the Nashville Bridge Company's plant under supervision of the Transportation Research and Development Station at Fort Eustis, Va.

Science News Letter, December 5, 1953

CE FIELDS

BOTANY

Arabs Say Adam, Eve Ate Acacia, Not Apple

➤ TRADITIONALLY IT was the eating of an apple that caused Adam and Eve to be expelled from the Garden of Eden, but if one Arab legend is right it was really a hard, dry acacia fruit.

Dr. Robert T. Hatt, director of the Cranbrook Institute of Science, Bloomfield Hills, Mich., traveling in Iraq found a small Arab village at the junction of the Tigris and Euphrates Rivers whose pride was a log. According to local legend, the log was from the original Tree of Knowledge.

During his visit, Dr. Hatt took some shavings from the log. After returning home, analysis of the shavings showed that the log was from an acacia tree — whose fruits are pods with hard, dry shells and unappetizing seeds. Quite unlike the juicy apple.

Science News Letter, December 5, 1953

MEDICINE

Exercise and Fitness Affect Vitamin A in Body

➤ EXERCISE AND physical fitness play a part in the body's handling of vitamin A and its parent chemical, carotene. Strenuous exercise seems to speed the rate at which the body converts carotene to the vitamin, but in a very fit person, this may be reversed.

Tests of 12 members of the Louisiana State University track team, made with the cooperation of A. C. Moreau, the coach, show this. The tests were made by Drs. William H. James of the university and the Agricultural Experiment Station, Baton Rouge, La., and Ibrahim M. ElGindi, now at Cairo University, Giza, Egypt.

For the tests, samples of finger blood were taken from each man about three minutes before and six minutes after a 40- to 50-minute period of strenuous activity. The activity consisted of a 15-minute warm-up, followed by running five or six 220-yard dashes at full speed at intervals of five minutes.

The level of vitamin A in the blood increased during the workout 43% on the average. The changes for each man varied from an increase of 106% in vitamin A to a decrease of 22%. The level of the parent chemical, carotene, decreased on the average 10%, with individual changes varying from an increase of 17% to a decrease of 50%.

According to the coach, the man whose vitamin A blood level increased 106% was in poor condition, while the only runner showing a decrease in vitamin A in his blood was in excellent condition.

The studies, reported in *Science* (Nov. 20), were made following an unexpected finding in study of the effects of certain proteins in the diet on the utilization of carotene. These studies were made on albino rats. The unexpected finding consisted of puzzling irregular large fluctuations of the blood vitamin levels. The only condition that could not be controlled and might have accounted for these fluctuations was the amount of the animals' physical activity.

Since tests of this effect could be made more easily on humans than laboratory animals, the cooperation of the track team was enlisted.

Science News Letter, December 5, 1953

INVENTION

Air Force Jet Gets Landing Gear Patent

➤ A PATENT has been issued by the government covering an "Aircraft With Quadricycle Landing Gear." The patent applies almost certainly to the Air Force's latest, fastest, flyingest, hush-hush jet bomber now being built by the Boeing Airplane Company.

The patent points out that it is desirable to house the landing gear in the plane's fuselage rather than in the wings. Putting the landing gear in the wings means a sturdier, heavier construction that imposes design penalties.

Therefore the patent describes a landing gear arrangement, retractable into the fuselage, that supports the 300,000-pound Stratofortress with eight wheels. Four are near the nose, four near the tail.

The landing units are alike, states inventor William H. Schlender of Seattle, Wash., who assigned has patent, No. 2,659,555, to Boeing. This "duplication" thus will simplify procurement and replacement problems, he predicts.

It is hard to believe that wheels spaced so closely together can support a giant plane having a wingspan of 185 feet. But Mr. Schlender states that one object of his patent is to provide improved stability for such a landing arrangement.

He states that wing-tip wheels can be used as a safety measure in case the plane touches down with one wing low, but reports that this creates no real problem because it rarely happens.

Details on this big plane in general still are sketchy because of secrecy. It is believed, however, that the Stratofortress has a range that puts it in the "intercontinental bomber" class. The plane is powered by eight J-57 Pratt and Whitney turbojet engines, and can be refueled while in flight.

During early ground tests of the plane, onlookers at Boeing Field, Seattle, reported that it cracked seven-inch-thick concrete runways there. Its engines made so much noise that nearby buildings shook.

Science News Letter, December 5, 1953

PHYSICS

Jet's Loud Noise Sparks Photographic Study

➤ THE PIERCING shriek of jet engines has sparked a study at Cornell Aeronautical Laboratory, Inc., Buffalo, N. Y., aimed at finding out how to make jet engines more "socially acceptable."

Schlieren photographs, recording on film shadows of atmospheric disturbances the eye cannot see, have revealed that noise is generated in two places when a jet of nitrogen is released. The first noisy spot is at the jet exit; the second is at the turbulence zone in the jet stream. This is the point at which the nitrogen mixes with the air.

In experiments in which compressed nitrogen was ejected from small copper tubing at supersonic and subsonic speeds, it was shown that the turbulence of the jet stream was less at subsonic speeds than at supersonic speeds. The noise generated in that zone also was less intense.

Writing in the *Journal of Applied Physics* (Aug.), Daniel S. Schwartz and Anthony L. Russo, both of the research laboratory, stated their investigations would be extended to jets of larger diameters.

Science News Letter, December 5, 1953

SURGERY

Refrigeration May Take Place of Artificial Heart

➤ A SUGGESTION that refrigeration of patients before heart operations may take the place of complicated and costly heart-lung machines appears in a report of four Denver medical men to the *Journal of the American Medical Association* (Nov. 21).

They have used the refrigeration method in 15 patients. Of these, one died as a result of the operation. A second patient died later but the operation showed that he could not have been saved by any method. The others have had excellent results.

The refrigeration, which is really cooling, is done by putting the patient in a tub full of ice water until the body temperature has dropped from the normal 98.6 degrees Fahrenheit to between 70.7 and 78.8 degrees Fahrenheit.

After the operation, the patient is warmed to normal by immersion in a tub of warm water.

Object of the refrigeration is to slow circulation so that the heart can be emptied of blood and kept empty to let the surgeon see clearly while he operates. An anesthetic is also given. Heart-lung machines do the same by circulating the blood through the machine outside the patient's body. The Denver doctors think, however, that the cooling method is simpler, less expensive, and worth further trial.

Drs. Henry Swan, Irvin Zeavin, S. Gilbert Blount Jr. and Robert W. Virtue of the University of Colorado School of Medicine report the 15 operations.

Science News Letter, December 5, 1953