TECHNOLOGY

Silicone Rubber Used in High Temperature Tire

➤ ROCK AND glass, major enemies of tires, have now contributed the basic ingredients in a new experimental tire that can withstand temperatures above 500 degrees Fahrenheit.

Silicone rubber, having a molecular backbone of oxygen and silicon, the latter an element in rock and sand, is used in the tire along with glass fibers. Developed by the U. S. Rubber Company and Dow Corning Corporation, the tire is partially translucent and pink-orange in color. The outer ply inside the tire can be seen through the sidewall.

Breakdown of rubber under heat is a major cause of blowouts in automobile tires, but the new silicone rubber treads probably will not be used for them at this time because of high cost of materials.

Such tires may be especially suited to landing gear on supersonic aircraft, since temperatures up to 500 degrees Fahrenheit are generated on tire surfaces due to friction with the ground during landings. Fire sometimes breaks out in the rubber vapors given off when high-speed planes land.

Use of silicone rubber and glass fiber is new in the tire industry. Rayon, nylon and cotton are used in the cord of automobile tires today.

The tire, still in the developmental stage, can also withstand temperatures as low as 90 degrees below zero Fahrenheit.

Silicone rubber has long been known for its excellent temperature properties, but has been considered impractical for tires because of its low strength and wearing properties.

Science News Letter, July 9, 1955

FORESTRY

Over 8.8 Million Acres Of Forest Lost in 1954

➤ CARELESS SMOKERS caused 23,330 of the 176,891 forest fires last year, the U. S. Department of Agriculture has announced. In total, 8,832,963 acres of United States forest lands were injured.

There were 12% more forest fires last year than in 1953, but the total area injured dropped by more than a million acres and the number of fires is still under the average for the past five years. Forest fire fighters were called to an average of 485 blazes a day in 1954.

Campers in lands under organized fire protection started 4,875 fires in 1954 compared to 5,140 in 1953 and 5,667 in 1952. Figures were not available on the causes of fires on unprotected lands.

The drop in number of fires in the past five years was credited by the USDA to drives such as the Smokey Bear fire prevention campaign and the Keep Green Programs.

Three causes alone accounted for 75% of the forest fires reported: Smoking started 23,330 last year and 20,696 in 1953; trash and brush heap fires caused 30,318 last year and 22,537 in 1953, and incendiary fires caused 40,520 in 1954 and 30,186 in 1953.

The Department pointed out that millions of acres are still inadequately protected with too few lookouts to spot and report fires immediately, too few suppression crews to hit fires when they are small or too little equipment to do the job effectively on the fire line.

Other causes of fires and totals were: railroads, 2,872 in 1954, 2,619 in 1953; lumbering operations, 2,928 in 1954, 2,309 in 1953; man-caused fires with miscellaneous origins, 14,650 in 1954, 12,580 in 1953 and lightning, 7,780 in 1954, and 8,528 in 1953.

Science News Letter, July 9, 1955

PUBLIC HEALTH

Frozen Cooked Dinners Give More Work to FDA

➤ FROZEN DINNERS that are ready to eat after heating a few minutes in the oven save the housewife work but increase the Federal Food and Drug Administration's work load, George P. Larrick, commissioner of Food and Drugs, said at the National Association of Retail Grocers meeting in Chicago.

The reason is that each additional step in processing a food, including quick freezing, peeling, breading, and cooking in the case of frozen cooked shrimp dinners, introduces another point where mistakes may occur. The mistakes may lead to contamination of the food or spoilage.

Recently thousands of pounds of breaded shrimp were removed from the market because of insect and rodent filth discovered in the breading material. As another example, Mr. Larrick reported that an FDA inspector had found a lot of chicken pies that had stood too long and were sour before they were frozen.

"Of course the packer destroyed the pies when he learned of their condition, but," Mr. Larrick told the grocers, "I shudder to think about the number of sick customers you might have had if those pies had been allowed to go out."

Science News Letter, July 9, 1955

INVENTION

Throw-Away Raincoat Receives U. S. Patent

➤ FOR PERSONS caught outdoors without protection in the rain, a Puerto Rican inventor has designed a paper raincoat to be sold in vending machines and thrown away after one use.

The disposable raincoat is made of either waterproof paper or glossy wax paper. It is fashioned in three sizes, small, medium and large, and can be adjusted to the individual's size. The inexpensive raincoat also features a do-it-yourself hood for the head.

The invention of Catalina R. de Cordero of Guayama, Puerto Rico, the raincoat received patent No. 2,711,538.

IN SCIEN

PHYSIOLOGY

Electric Model Studies Body Temperatures

➤ MAN'S WELL-BEING and efficiency under widely-varying temperature conditions is being tested by an electric model of one of nature's most marvelous and complex mechanisms, the system that regulates body heat.

The model was designed by Norman E. Friedman for research under Dr. Craig Taylor of the department of engineering at the University of California at Los Angeles.

The device is actually a computer using conventional thermal-electric analogue designs. Current sources within the model provide simulation of body heat.

The study of human temperature regulations has many important applications in industry and military operations, Dr. Taylor pointed out. The design of human thermal environment in home or factory is the task of industry. The pilot's response to extreme cockpit heat in supersonic flight is of concern to the military.

Man's central mechanism of temperature control is like a dual thermostat that activates both heating and cooling units, Dr. Taylor said. Because of many complex, interacting factors, no simple formula can be used to determine human temperature reactions. Therefore, data obtained from the electric model are being checked against that obtained by actual measurements on the human body.

Science News Letter, July 9, 1955

PSYCHOLOGY

Stars Invisible During Day From Bottom of Well

➤ THE COMMON belief that stars can be seen in the daytime from the bottom of a dry well or a tall chimney is "without real foundation," a physicist has found.

The idea that a long shaft makes stars visible in daylight probably has persisted because of occasional chance sightings of the planet Venus, which is "frequently visible to the naked eye in broad daylight."

Dr. Alex G. Smith of the University of Florida made both photographic and photoelectric measurements showing a long shaft had "no appreciable effect" on the amount of light and the color of the daytime sky.

Other scientists have shown that ability to distinguish objects is impaired when the test field is a small, brightly lighted area surrounded by darkness, Dr. Smith reported in the *Journal of the Optical Society of America* (June).

Science News Letter, July 9, 1955

CE FIELDS

ENTOMOLOGY

Fruit Fly Studies Aid Poultry Production

➤ BLUE-BLOOD FAMILIES need a bit of the common touch to maintain their superiority, U. S. Department of Agriculture scientists have learned.

Studying the egg-laying performance of different breeds of fruit flies, they found that "elite" egg-laying offspring are less likely to come from mating two superior inbreds than from a superior line mated with an average or inferior performer.

The USDA scientists are applying lessons learned from fruit fly cultures to poultry breeding problems. After accounting for differences in their body sizes, there is a significant agreement between rate of egg laying and egg size in flies and chickens, the USDA said.

By using the fast-breeding flies instead of chickens, records on the effects of different breeding practices on egg production and size are obtained in a few weeks rather than the years necessary with poultry.

In both flies and chickens, about 10% of the egg production character is heritable, while egg size is about 30% to 40% dependent on genetic factors in them.

Science News Letter, July 9, 1955

CHEMISTRY-ARCHAEOLOGY

Zinc Content Shows Age of Old Brass

➤ THE CHEMIST has again given archaeologists a new technique for dating their finds and detecting forgeries. The method has served to detect a counterfeit of the days of Julius Caesar.

Ancient Roman brass objects can be accurately dated by analyzing the metal content, Dr. Earle R. Caley, Ohio State University chemist, reported. By analyzing coins of known date, Dr. Caley found that the oldest coins dating from about 45 B.C. contained the least copper and the most zinc.

In the following 250 years, there was a steady increase in the amount of copper and a corresponding decrease in the amount of zinc.

Under the Emperor Augustus, in 23 B.C., the coins contained nearly 22% zinc. By the time of Marcus Aurelius, 161-180 A.D., the zinc content had dropped to less than seven percent.

The drop in zinc content was probably due to the Roman practice of remelting old coins to make new ones. In the process, zinc was lost through oxidation and volatilization.

A coin of the days of Julius Caesar was found a counterfeit by Dr. Caley. It contained less zinc than did genuine brass articles of the period.

Ancient brass objects other than coins might be dated by the zinc-content method, Dr. Caley says, because it is probable that all Roman brass was produced in the mints.

Another method of dating archaeological finds—those which contain wood, charcoal, or other plant remains—is to measure the amount of radioactive carbon they contain. This method was also a contribution from chemistry, an outgrowth of the work on the atomic bomb.

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MEDICINE

New Research Center To Study Body's Needs

➤ TO LEARN more about the body's needs and responses in this modern world, a new research center has been established at the University of California at Los Angeles.

Operated by the department of physical education, the research center already has four major projects under way. The center hopes to expand its operations in the future as larger physical facilities become available, according to Dr. Ben Miller, chairman of the department.

The research program will be under the direction of Dr. Lawrence Morehouse, a new member of the faculty formerly associated with the fatigue laboratory at Harvard University, Randolph Field's aviation medicine section, and the University of Southern California.

The four research programs now in progress include 1. study of the body's balance mechanism, 2. relation of muscle power to speed of movement, 3. a study of the value of warm-up in athletics, and 4. an investigation of physical growth and performance among school children.

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TECHNOLOGY

Electronic Instrument Used in Treasure Hunt

➤ ARMED WITH modern electronic devices, modifications of the wartime mine detectors, a party including scientists and a deep-sea diver is searching Block Island, a seven-mile-long island off the coast of Rhode Island, for the famous buried treasure of the pirate Captain Kidd.

It is believed to be the first time that hunters for Captain Kidd's treasure have been aided by modern scientific instruments. Formerly, treasure hunters have been guided by maps found under mysterious circumstances or by legends, intuition, and plain hard digging.

The expedition is sponsored by the Rhode Island Development Council and Radiac Company, a division of General Nucleonics Corporation. The treasure they are searching for is believed to be worth over $700,000.

Science News Letter, July 9, 1955

PHOTOGRAPHY

3-D Camera Gives Accurate Close-Ups

➤ A 35 MM camera for taking accurate three-dimensional close-ups, either in color or black and white, will soon be available from the Perkin-Elmer Corporation, Norwalk, Conn.

Its unique optical design, eliminating distortions found in ordinary stereo cameras, was perfected by Dr. David Donaldson, who is associated with the Howe Laboratory of Ophthalmology, Harvard Medical School, Boston.

Previously, a photographer using stereo has had to rely on trial and error procedures in order to take close-ups of such small objects as human eyes or skin lesions. Either the camera or the subject had to be moved between exposures to get "matched" pictures.

The new camera has a built-in focusing arrangement to insure accurate results either by amateur or professional. It is expected to be particularly valuable for medical research.

Science News Letter, July 9, 1955

MEDICINE

Fight Cattle Disease To Save Human Hearts

➤ A MAJOR cause of heart deaths might be stopped by a successful fight against Bang's disease in cattle, it appears from research findings by Dr. Thomas M. Peery of George Washington University, Washington.

Bang's disease in cattle is known as brucellosis in humans. This infection, Dr Peery believes, may damage heart valves and bring on a condition similar to that of rheumatic fever. He thinks a significant percentage of damaged hearts now attributed to rheumatic fever may actually be caused by brucellosis.

"On the basis of clinical symptoms and signs there is no possibility of differentiating these two diseases with certainty," Dr. Peery said. "Sensitive laboratory facilities of the pathologist are necessary for a relatively accurate diagnosis, but even under the most ideal laboratory set-up brucellosis is still a most difficult disease to diagnose properly."

Brucellosis is a bacterial disease contracted in a mild but persistent form by the drinking of raw milk. In its more serious forms, it is an occupational disease among farmers, butchers, veterinarians and others handling farm animals.

By studying both patients in the hospitals and case histories in the literature, Dr. Peery noted that heart involvement similar to that of rheumatic fever, which annually kills and cripples more children than polio, was an important sequel to brucellosis.

Further studies of the literature on autopsies by Dr. Peery indicated that heart inflammation is the chief cause of death in fatal brucellosis.

Science News Letter, July 9, 1955