

CHEMISTRY

New Man-Made Fiber Can Carpet Kitchen

See Front Cover

➤ CARPETED KITCHENS and bathrooms are promised by a new man-made olefin fiber which can be driven over by trucks with hardly a trace.

The fiber, trade named "Herculon," derived from petroleum, is spun in a continuous filament, such as a silkworm spins its cocoon of fine silk. It is solution-dyed when the fiber is spun, creating "locked in" color that does not fade, wear out or wash out.

Seen on this week's front cover is Herculon olefin staple tow (yarn for spinning) being stretched at the Hercules Research and Development Center at Covington, Va., to orient the molecules in the fiber. This process gives the fiber its characteristic properties, such as strength and elongation. The tow is cut into lengths and pressed into bales for shipping to yarn and spinning mills.

Carpeting made from the new fiber withstood nine weeks of testing in a service station, bearing the traffic of people, cars and trucks.

The Hercules Powder Company, Wilmington, Del., which developed the new fiber, reports it is as smooth, soft and resilient as the finest of rugs, resisting pilling, fuzzing, shedding, soil, moisture and mildew as well as heavy pressure.

The firm is marketing its new carpeting for all rooms of the house.

• Science News Letter, 85:280 May 2, 1964

PSYCHOLOGY

Buck-Passing Parents Harm Disturbed Child

➤ PARENTS of emotionally disturbed children often resent the implication that they themselves are involved in the problem, psychologists believe.

These parents often will withdraw the child from treatment when he needs it most, if the psychiatrist focuses attention on the home and parents.

Three psychologists at the Eastern Psychological Association meeting in Philadelphia pointed out that the child's behavior reflects the condition of the home, for his behavior is an attempt to adjust to his most important environment.

Therefore, they agreed, a vital part of treating the child is working with the parents.

Treatment of children is most often a failure when the parents insist that they themselves are perfectly "happy and normal," one psychologist said.

Very often parents are using this argument to conceal from themselves that there is difficulty in their marriage or personal adjustments.

The psychologists agreed that with the cooperation of parents, the family can be treated as a whole, the problems quickly uncovered, and a constructive program for the improvement of the child begun.

This way improvement often is faster than in other areas of psychology, because

the interaction between the improving child and the cooperative mother helps them both.

Tess Forrest, Jewish Family Service, New York City, advocates encouraging therapy for the family, viewing the family as a whole and treating it as such.

Milton S. Gurvitz, Great Neck Consultation Center, Great Neck, N. Y., said the parents must undergo extensive therapy to produce lasting results in the child.

But Haim G. Ginott, New York University, said trying to get parents to accept treatment, even to admit that the family as a unit needs to be considered, causes so many parents to take their children away. It is better to try to educate the parents rather than subject them to psychotherapy, he said.

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PHYSICS

Computer Shows How Real Stars Behave

➤ "SYNTHETIC STARS" being calculated on a computer using formulas first solved during development of the atomic bomb are helping scientists understand how real stars behave.

The real stars duplicated in a computer are giant ones that dim and brighten regularly, and also expand and contract periodically. They are called Cepheids and RR Lyrae stars, and are from five to 250 times bigger than the sun.

The computer calculations were made in an effort to understand what physical processes inside these stars cause them to act as they do. They were made by Dr. Robert F. Christy of the California Institute of Technology, Pasadena, who reported them in *Reviews of Modern Physics*, 36:555, 1964.

This issue celebrated the 60th birthday of Dr. J. Robert Oppenheimer, who was director of the Los Alamos Scientific Laboratory, Los Alamos, N. Mex., during World War II when the numerical solution of Newton's equations of motion and heat flow were first carried out.

Dr. Christy was then a member of the theoretical division of the Laboratory. At that time one such calculation took weeks. New computers now permit more complicated problems to be solved in minutes.

Dr. Oppenheimer is now director of the Institute for Advanced Study, Princeton, N. J.

According to the calculations, the source of the pulsations, changes in brightness and other properties of the stars is the heat from the core of the star, where it arises from nuclear reactions.

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PALEONTOLOGY

Fossil Plants Subject Of Summer Study

➤ A GROUP of teachers and advanced college students will explore this summer the ancient plants of past ages whose fossils are preserved in the rock layers of the earth. Lock Haven State College, Pa., will hold an advanced science seminar in paleobotany led by Dr. Theodore Delevoryas of Yale University.

• Science News Letter, 85:280 May 2, 1964

IN SCIEN

TECHNOLOGY

Gas Turbine Clutch Improves Truck Braking

➤ A CLUTCH SYSTEM offering improved fuel economy and breaking power has been developed by General Motors as part of a new gas turbine engine, designed for use in heavy-duty commercial vehicles.

The new system maintains virtually constant turbine inlet temperature throughout the range of engine speed. During vehicle deceleration, the device links the drive shaft to the turbine compressor, providing two to three times the breaking power of a comparable gasoline or diesel engine.

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GEOPHYSICS

Gravitational Constant Varies in Electrical Field

➤ THE GRAVITATIONAL CONSTANT, one of the most important numbers in science because its value is believed the same everywhere in the universe, has been found to vary.

The gravitational constant, or G, depends on the electrical field in which it is measured, Dr. Erwin J. Saxl, president of Tensitron, Inc., Harvard, Mass., reported. This measured change in the value of G shows that "electricity, inertial mass and gravitation" are related, Dr. Saxl told the American Geophysical Union meeting, in Washington, D. C.

His experiments showed that electric charges may influence moving masses under certain conditions. Dr. Saxl has measured the motion of a twisting pendulum with an accuracy of millionths of a second over a period of ten years to determine G.

He has found that if positive or negative voltages are connected to the pendulum and its cage, the time the pendulum takes to make one swing changes. Positive charges delay the pendulum most; negative charges less. The fastest speed is measured when the pendulum is at ground potential.

Dr. Saxl said this erratic behavior is not expected by theory and cannot be explained by electric damping.

He said the pendulum is also capable of measuring changes in the earth's electrical field due to eclipses, hurricanes, volcanic eruptions and disturbances preceding earthquakes. The equipment, Dr. Saxl believes, can also register far-off nuclear blasts.

However, Dr. Saxl warned, the information he has gathered on such possibilities are only preliminary and additional work, including records made around-the-clock, are required.

Dr. Saxl reported he had also found daily as well as seasonal variations in the gravitational constant. The average value of G, however, remains the same.

• Science News Letter, 85:280 May 2, 1964

CE FIELDS

PUBLIC HEALTH

Coal-Powered Stations Release Radioactivity

➤ AN ELECTRICAL STATION generating power by burning coal releases greater quantities of radioactive material into the air than many power plants using nuclear energy.

This applies when the stations are of the same size, Drs. Merrill Eisenbud and Henry G. Petrow of New York University Medical Center have concluded. The comparison can be made, they said, only when the physical and biological properties of the radioactive materials polluting the atmosphere are taken into account.

They analyzed the radioactivity of the ash thrown out of smokestacks after pulverized Appalachian coal was burned and passed through a precipitator. Although this ash is only two and a half percent of the total produced at one plant, it can account for pouring as much as 28 millicuries of radium into the atmosphere each year.

Their calculations are based on a 1,000-megawatt plant, the scientists reported in *Science*, 144:288, 1964.

In comparison, the Yankee Nuclear Power Station at Rowe, Mass., discharged only 1.9 millicuries of radioactive gaseous wastes into the atmosphere during 1961.

Neither the coal-burning nor the nuclear-fueled power plants release sufficient amounts of radioactivity to cause a health danger.

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PSYCHOLOGY

Psychiatrists Study Way To Predict Early Births

➤ A POSSIBLE WAY to predict premature births and other complications of pregnancy due to psychological factors was reported in the *Archives of General Psychiatry*, 10:324, 1964.

The general belief that psychological factors help to cause sterility, spontaneous abortion, premature births and complications of delivery has never been fully studied, three New York researchers said.

Expectant mothers are being given self-rating attitude tests in the early months of pregnancy. The 48 questions cover such topics as a woman's appearance during pregnancy and superstitions about breast feeding.

Also included are questions aimed at finding out how much the women worry about having premature babies and about the health of the unborn child.

Drs. Abram Blau, Joan Welkowitz and Jacob Cohen of the Mount Sinai Hospital Institute of Psychiatry, New York, plan to analyze the test scores in light of the subsequent course of the pregnancies.

In a previous study, Dr. Blau found that

30 women whose children were born prematurely showed negative attitudes to the pregnancy, greater emotional immaturity, greater concern about physical appearance and less adequate resolution of family problems than 30 women delivering "full-term" infants.

The test, known as the Maternal Attitude Toward Pregnancy Instrument (MAPI), is being given on a much larger scale with the hope that, if corroborated, obstetrical complications could be predicted beforehand and perhaps prevented.

• *Science News Letter*, 85:281 May 2, 1964

BIOTECHNOLOGY

New Technique Helps Analyze Single Cell

➤ THE STUDY of individual "organs" of single living cells is now possible.

A new technique devised by Dr. Marcel C. Bessis, director of research laboratories of the National Transfusion Center in Paris and professor on the medical faculty of the University of Paris, uses an ultraviolet light or laser beam to damage or destroy selectively various parts of a single cell, one at a time, in order to study how the whole cell functions.

Dr. Bessis described his new technique at a meeting of the American College of Physicians in Atlantic City with the aid of films. His procedure uses a combination of light microscopy, electron microscopy, time-lapse cinematography, closed circuit television, special chemical stains and death rays.

The death rays can be ultraviolet light or a laser beam, which are pinpointed on a particular internal structure within the cell. The laser beam is the more powerful and can be focused on a smaller point than the ultraviolet light.

When cell components are stained, they absorb energy more readily than unstained ones. Thus, the laser beam can be directed at selectively stained organelles (cell organs) which absorb the energy and are incapacitated or destroyed.

The technique is extremely flexible. The rays can be adjusted to kill only certain organs within the cell without destroying the cell itself and the intensity of the beam can be regulated to deliver sublethal as well as death-dealing doses.

• *Science News Letter*, 85:281 May 2, 1964

MEDICINE

Experimental Vaccine May Prevent Trachoma

➤ EXPERIMENTAL VACCINES are on the way to prevent trachoma, an eye disease that is the most important cause of blindness in the world. One sixth of the world's population, an estimated 500 million persons, is afflicted.

An editorial in the *Journal of the American Medical Association*, 188:173, 1964, pointed up work done by Dr. J. Thomas Grayston, who worked with the U.S. Naval Medical Research Unit at Tapei, Taiwan, and at the University of Washington, Seattle.

Dr. Grayston reported the study in the *Archives of Environmental Health*, 8:518, 1964.

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PHYSICS

Laser Light to Track Cape Kennedy Launchings

➤ LASER LIGHT of high intensity and only one frequency will be used to track missiles and space vehicles launched from Cape Kennedy, Fla., if tests continue to be successful.

Called OPDAR (from Optical Direction and Ranging), the Perkin-Elmer Corporation device gives information on missile position, velocity and acceleration immediately during flight.

The major element of OPDAR is a continuous wave gas laser that emits a very narrow, highly directional light beam. The beam is flashed to a mirror mounted on the missile's first stage and the reflected light collected by the OPDAR's receiving system.

The difference in phase between the transmitted and received signal determines the missile's distance.

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CHEMISTRY

Hollow-Glass Fibers Reinforce Plastic

➤ HOLLOW "TUBES" of glass fiber offer many advantages in strength and weight-saving over the conventional solid fibers, a U.S. Department of Commerce study shows. The new material will be used for missile parts, aircraft radar domes and other varied applications.

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BIOTECHNOLOGY

Latex Cup Beats For Tired Heart

➤ A FLEXIBLE DEVICE that fits over the heart in surgery is designed to help patients whose hearts are in immediate danger of stopping.

This electronically-operated latex cup consists of an inner elastic liner bonded to an inelastic, yet flexible, outer shell. It beats for the heart.

The developer, Dr. Jacob Kline, associate professor of electrical engineering at the University of Rhode Island, in Kingston, says that this "artificial" heart would be safer, more reliable, and more effective than heart-lung machines that bypass the heart and lungs entirely.

In these machines the circulation of the blood over a period of time can cause cell destruction. One engineer said the problem of pumping blood is like trying to circulate egg yolks without breaking them.

By helping out instead of replacing the weakened heart, this new device will cause less damage to blood cells.

The device, which has been tested successfully on a dog, will be refined by a team of University of Rhode Island scientists including Drs. John Yashar, John J. DeFeo and Dr. Kline. This group has also developed a valve to replace the aortic heart valve which requires much less time in surgical positioning than earlier valves.

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