

SPACE

Anechoic Chamber Tests Reentry Vehicles

See Front Cover

► DESIGNS of reentry vehicles that cannot be detected by the searching rays of radar are evaluated in the microwave anechoic chamber seen on this week's front cover at the Douglas Missile and Space Systems Division in Santa Monica, Calif.

This weird-appearing chamber is 50 feet long and 17 feet square. It is lined with thousands of carbon-impregnated sponge rubber baffles that almost totally absorb stray radar signals. Highly accurate measurements of the energy reflected by the test specimens can be obtained. R. S. Thomson, engineer at Douglas, positions one of the precisely machined scale models used in the experiments.

Research indicates that large geometric shapes do not necessarily produce obvious "signatures" which betray their presence to radar. Telltale characteristics of reentry vehicles include shape, mass, speed, heat and plasma wake.

• Science News Letter, 85:312 May 16, 1964

PUBLIC SAFETY

Workers Cautioned in Use of Contact Lens

► CAUTION on the use of contact lenses by industrial workers is recommended by the AMA Council on Occupational Health in the *Journal of the American Medical Association*, 188:397, 1964.

All use of contact lenses is not condemned, but in some jobs they may be hazardous, the council explains.

• Science News Letter, 85:312 May 16, 1964

MEDICINE

No Quick Cancer Cure In View at Present

► SLOW PROGRESS, not quick solution, is the only realistic approach to the cancer problem, a University of California virologist has warned.

The sanguine view promoted by some groups that complete understanding as well as a cure of cancer lies near at hand is misleading, Dr. Harry Rubin, professor of virology on the Berkeley campus, said at the National Institutes of Health in Bethesda, Md.

It has taken more than 50 years of building on the discovery of Dr. Peyton Rous to discover just how the Rous sarcoma virus (RSV) may cause cancerous growth in chickens and some other birds.

Dr. Rubin said that only recently RSV has caused cancer in infant monkeys at the Sloan-Kettering Institute in New York, thus becoming the first known virus cause of malignancy in primate animals.

Dr. Rubin and his co-workers have discovered that the Rous sarcoma virus, which is the only one changing normal cells to cancerous ones, is "defective" and needs a "helper" virus to reproduce.

RSV is a kind of viral wolf in sheep's clothing, Dr. Rubin said, explaining that it borrows a distinctive protein coat from one of the apparently harmless avian leukosis viruses, thus disguising its approach to normal cells and changing them to cancerous ones.

Whether the newly acquired property of some RSV strains to cause cancer in mammals is due to a change in its coat is under intensive investigation.

A big barrier to progress in understanding cancer, Dr. Rubin said, has been the lack of an experimental system to study malignant changes in cells.

Dr. Rubin gave the 13th annual Dyer lecture honoring Dr. R. E. Dyer, a former director of the National Institutes of Health, who is now on the faculty of Emory University, Atlanta, Ga.

• Science News Letter, 85:312 May 16, 1964

ARCHAEOLOGY

Aztec 'Basketball' Court Unearthed in Mexico

► A MAJOR ARENA where the basketball-like sport of ollamalitzli was played has been unearthed in the Valley of Mexico.

Dr. H. B. Nicholson and David Grove, University of California at Los Angeles archaeologists, recently explored a site of this ancient hoop sport, a favorite of Aztec rulers.

The site, known as Ixtapaluca Viejo, is east of Mexico City. Its ball court is the first to be discovered in the Valley of Mexico, although every sizable town had at least one court when the Spaniards came.

The court was called tlachtli or tlachco. The game had elements of soccer and handball as well as basketball. It was played with a solid rubber ball just smaller than a volley ball. Players were not permitted to use hands or feet in handling the ball but batted it around with elbows, hips and knees. They often wore leather pads.

Stone rings projected vertically from a wall on either side of an I-shaped court. Climax of the game was that infrequent occasion when a player was able to sock the ball through the ring, or hoop of the opponent, entitling him to all the spectators' clothing.

The sport, played on elaborate masonry courts, was highly organized among the Aztecs by the time the Spaniards came. Montezuma, famed Aztec emperor, was a skilled player, and each Aztec ruler had his own "stable" of subsidized athletes. Today the game survives only in a degenerate form in western Mexico.

Dr. Nicholson had previously uncovered a bush league outpost of the sport in a remote part of northeastern Mexico. The newly explored major league arena was architecturally more sophisticated. No rings were found, as the top of the playing wall had been destroyed, but many stone rings were discovered in the same general zone.

This newly discovered court is in the ruins of an Aztec town which was tributary to Montezuma. A few decades prior to the coming of the Spaniards it had probably served as a military outpost.

• Science News Letter, 85:312 May 16, 1964

IN SCIEN

MEDICINE

Breast Cancer Risk Less In Long-Nursing Mothers

► THE LONGER a woman nurses children and the shorter the time she spends menstruating, the less danger she runs of getting breast cancer.

Studies at Roswell Park Memorial Institute, Buffalo, showed that the risk of breast cancer is increased for women who never marry, who have never been pregnant, who have had their pregnancies late in life and who have never nursed babies.

Comparison with Japanese women, whose breast cancer rate is only about one-fifth or one-sixth as common as in the United States, showed that the Japanese menstruate during an average of 21 years and secrete milk (lactate) for six or seven years, while women in the Roswell Park studies menstruated during an average of 30.2 years and lactated 1.2 years.

All patients entering Roswell Park for three years were carefully studied and asked questions designed to throw light eventually on the causes of various kinds of cancer.

Questions were included on such things as fertility, birth weight of children, miscarriages, still births and radiation exposures, nursing and menstrual history.

Research findings showed less risk of breast cancer in women who had nursed a total of more than 36 months during their lifetime than in those who had had their menopause years shortened artificially by surgery or radiation.

The American Cancer Society reported the findings of the research by Drs. Morton L. Levin, Paul R. Sheehy, Saxon Graham and Oliver Glidewell.

• Science News Letter, 85:312 May 16, 1964

METALLURGY

New High Strength Cast Steel Announced

► AN IMPROVED ALLOY steel with properties superior to those of any cast steel now available was reported at a meeting of the American Foundrymen's Society.

The low alloy steel exhibits an exceptional combination of good toughness and high yield strength without requiring a liquid quench heat treatment.

Dr. R. J. Knoth, International Nickel Company, Inc., said at Atlantic City, N. J., that conventional steels must be quenched to provide high yield strength when used in heavy sections. In the new steel, he said, simple heat treatment provides uniformly good properties, even in heavy sections, making it fully capable of high mechanical properties, even in heavy sections.

The paper was prepared by Mr. Knoth and R. D. Schelling, of International Nickel's research laboratory in Bayonne, N. J.

• Science News Letter, 85:312 May 16, 1964

CE FIELDS

CHEMISTRY

New Use for Laser: Analyzing Liquids

► THE LASER, a device giving an intense, very pure beam of light, has a new scientific role, analyzing liquids.

Not only can the laser be used to identify the kind of chemical substance but also the amount of that substance, Dr. S. P. S. Porto of Bell Telephone Laboratories, Murray Hill, N. J., reported in New York.

He said the laser could be used to distinguish benzene from toluene, which is a distinction very hard to make by chemical methods.

When a laser beam is passed through a liquid, one frequency enters but several frequencies, or colors, emerge. The number and kinds of colors coming out vary for different chemical substances.

"Large molecules cause many colors and small molecules few colors," Dr. Porto told a conference on the laser sponsored by the New York Academy of Sciences.

• Science News Letter, 85:313 May 16, 1964

BIOCHEMISTRY

Ulcers in Older People Caused by Stagnant Food

► GASTRIC JUICE in excessive amounts is the cause of ulcers, but its presence occurs in a roundabout way in the stomachs of older persons.

Dr. Lester R. Dragstedt, surgeon at the University of Florida, Gainesville, explained differences in the causes of ulcers at the National Academy of Sciences meeting in Washington, D. C.

Stomach ulcer patients are in sharp contrast to duodenal ulcer sufferers, whose ulcer is located in the duodenum just beyond the stomach where the small intestine begins. Sufferers from stomach ulcers are usually older persons in whom the secretion of gastric juices in the intervals between meals is actually less than that in normal people.

Food stagnation in the stomach, however, stimulates gastric secretion by means of a hormone called gastrin, which is freed from the mucous membrane of the stomach's lower part, or antrum, when it comes in contact with food.

In this roundabout way the gastrin enters the bloodstream and stimulates the gastric glands in the upper part of the stomach to secrete gastric juice. Eventually the buffering power of the food in the stomach is overcome and the concentration of pepsin and hydrochloric acid in the gastric content rises until it is about equal to that found in the pure secretion.

Under these conditions, Dr. Dragstedt said, the gastric content becomes corrosive enough to break down the normal wall of the stomach and produce a stomach ulcer.

This has been shown in experiments on lower animals.

Duodenal ulcer sufferers usually secrete from three to 20 times as much gastric juice in the empty stomach as normal people do.

Dr. Dragstedt some years ago introduced surgery on the vagus nerves leading from the stomach to the brain. By dividing these nerves, which have become overactive through the tensions, strains and competitive efforts of modern life, the hypersecretion of gastric juice is abolished.

"Duodenal ulcers usually heal and remain healed," Dr. Dragstedt said, "provided food does not remain in the stomach for an abnormally long period."

• Science News Letter, 85:313 May 16, 1964

METEOROLOGY

New Kind of 'Whistler' In High Atmosphere

► A NEW KIND of "whistler" has been discovered high in the earth's atmosphere.

Whistlers are one of the many low-frequency sounds, including "tweeks" and "dawn chorus," detected in earth's outer atmosphere by scientists using special equipment.

These strange noises provide clues about how the sun's radiation affects the ionosphere, which reflects radio waves to provide long distance communications.

The new kind of whistlers were discovered from rocket and satellite observations as well as by ground stations. The inaudible low-frequency sounds are reflected back and forth in a layer between the lowest part of the ionosphere, about 50 miles high, and the top, about 600 miles high.

Details of observations on these trapped whistlers were reported to the International Scientific Radio Union meeting in Washington, D. C., by scientists from Stanford University's Radio Science Laboratory in California. The new whistlers are most easily detected within an hour or two after sunset on the ground.

The research was supported by the National Aeronautics and Space Administration because it wants to know everything possible about the space through which astronauts orbit.

The Stanford scientists reporting the work were Drs. D. L. Carpenter, J. F. Walkup, N. Dunckel and R. L. Smith.

• Science News Letter, 85:313 May 16, 1964

COMMUNICATIONS

Multi-Voice System Developed for Satellites

► A NEW TYPE of multiplex, a device permitting many voices to be carried on one communications channel, has been developed for use in satellites, microwave relays, and on-land and undersea cables.

A product of the International Telephone and Telegraph Corporation, New York, the new multiplex saves equipment space. By replacing germanium transistors with airtight silicon components and reducing the number of plugs and connectors, reliability has been improved.

• Science News Letter, 85:313 May 16, 1964

AGRICULTURE

New Food Preservative Isolated in Oats

► A NATURAL preservative in oats has been isolated by British scientists that may well help preserve foods such as breakfast cereals, canned foods, salad and cooking oils, margarines and shortenings.

The new preservative substances are antioxidants. They can slow down the process of spoilage in grain products and lessen the breakdown of vitamins and essential fatty acids, British scientists report at the Research Association of British Flour Millers, St. Albans, England.

But these antioxidants are partially inactivated when the oats are processed, and therefore are unable to prevent spoilage and breakdown for prolonged periods.

The new antioxidants contain caffeic acid, which will slow down the spoilage even when the oat products are processed.

After isolating the new antioxidants, the British scientists split and recombined them to produce some antioxidants that are soluble in water and others that are soluble in fats.

The work was supported financially from a Public Law 480 grant, administered by the Agricultural Research Service in Beltsville, Md., part of the U.S. Department of Agriculture.

Public Law 480 authorizes, among other things, agricultural research in foreign scientific institutions which are paid for with foreign currency accumulated from sales of surplus United States agricultural commodities to friendly countries.

• Science News Letter, 85:313 May 16, 1964

TECHNOLOGY

Blind Programmers Can Save Time, Money

► BLIND COMPUTER programmers can be more valuable than those who can see, and a Cincinnati high school student has proven it.

Michael L. Lichstein, 17, totally blind since he was nine, said that the blind person is more used to an unseen environment, and therefore can better imagine the invisible goings-on in the "mind" of a computer.

A blind programmer works more efficiently, and, more important, makes fewer mistakes, he told the Spring Joint Computer Conference in Washington, D. C. With computer time costing as much as \$500 an hour, each mistake avoided would be a considerable saving.

Michael has made several important contributions to the use of the blind in computer work. He developed a system by which a computer prints its output directly in braille, as well as a device to enable a blind person to read punched cards by feel. A heat-sensitive probe tells him which lights on the computer are on and off.

The Association for Computing Machinery has set up a committee for training and job placement of blind programmers. Many jobs are available, since each of the 17,000 computers in the U.S. needs an average of 10 programmers.

• Science News Letter, 85:313 May 16, 1964