PHYSICS

Basic Constant of Atom Measured for First Time

➤ THE FIRST ACCURATE measurement of a basic constant of the atom was reported in New York by University of Michigan scientists.

The constant measured by the Michigan team is the gyromagnetic ratio of the free positron, which is the antimatter counterpart of the electron.

The experiment extends to the world of antimatter one of the key tests upon which the whole structure of modern physics is based.

The positron's gyromagnetic ratio, called the "g-factor," was measured to one part in 100,000, Dr. Arthur Rich and Prof. H. R. Crane told the American Physical Society meeting. Continuing experiments should result in even higher accuracy.

The antimatter positron and the electron are among the tiniest of charged atomic particles. Having both a spin and a magnetic field, they are analagous to tiny spinning bar magnets. The g-factor is the ratio of a particle's spin to its magnetic force.

The reason the measurement is important is that some scientists have suspected recently that there are deviations in the theory of quantum electrodynamics upon which modern theories of the ultimate structure of matter are based. The value for the g-factor should be the same for both the electron and the positron, as it has so far been shown to be.

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PUBLIC SAFETY

British to Establish Drinking Driver Test

➤ THE COMMON TESTS given in the United States to determine the amount of alcohol in the blood of a drinking driver include breath and urine analysis. Both methods have their shortcomings, however, and a team of British scientists has been trying to sort them out.

London authorities are especially interested in the problem since legislation soon to be introduced will make it an offense to drive with more than a given amount of alcohol in the blood. In the United States, the amount established by the Traffic Institute at Northwestern University, Evanston, Ill., is 0.15% and above.

Policemen in the Nation's Capital follow this figure, using a urine test to determine the amount.

In other places, a breath test, using a balloon or other type of container is used. Breath analysis could provide useful screening tests in police work, the London researchers reported in the British Medical Journal, Jan. 22, 1966, because this technique underestimates the true alcohol concentration in the blood.

Urine analysis can be of value, but this test is tricky. A specimen must be analyzed within the first 30 minutes after drinking, and since the urine peak in some people is not passed for two or three hours after drinking, application is limited. In practice, the investigators say at least two urine samples are needed about 30 minutes apart.

Laws on alcohol content do not suggest that a drinking driver is necessarily drunk. They simply state that it is an offense to drive when alcohol in the blood exceeds the stipulated level.

The effect of ethyl alcohol on the central nervous system is similar to that of a general anesthetic, the researchers point out. Fortunately, because of its high solubility in water, the amount of alcohol required to produce the degree of saturation necessary for unconsciousness is greatly in excess of that consumed by the average drinker. In practice, therefore, ethyl alcohol has only slight effects on the brain.

This "slight effect," however, is enough to hamper performance of tasks demanding skill and accuracy. When the task is one that exposes others to risk, such as driving, then even slightly impaired ability is a matter of concern.

Reporting on the research, which involved 10 dogs as well as 24 human male volunteers, were Drs. J. P. Payne, D. W. Hill and N. W. King, all of the department of anesthetics, the Royal College of Surgeons, London.

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BIOTECHNOLOGY

Rabies Vaccine Approved For Preinfection Use

➤ A RABIES VACCINE is now available for use before the dog bites.

The vaccine, first introduced in 1957, has been licensed by the division of biologics standards of the National Institutes of Health for use by "high-risk" people such as police officers, kennel workers and mailmen.

The vaccine, a killed-virus type produced in embryo ducks, received Government approval because it does not contain the "paralytic factor" found in Pasteur-type vaccines, which are made from rabbit brain tissue.

In some people this factor causes paralysis and even death. Doctors have therefore been reluctant to recommend immunization except in cases of known exposure to rabies.

There are two possible treatment schedules with the vaccine: either three doses, a week apart, and one four to five months later, or two doses, a month apart, and a third dose seven months later. An annual booster shot is then enough to maintain adequate immunity.

Eli Lilly and Company, Indianapolis, Ind., recommends blood tests one month after the initial series of doses and after each booster, to make sure that sufficient protective antibodies are present.

Standard rabies treatment, given only after exposure, consists of at least 14 painful injections, one a day for two weeks, into the muscle wall of the stomach.

About 30,000 such treatments are given each year in the United States. The treatment, together with intensive public education about rabies, has reduced deaths from this disease to less than five per year.

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IN SCIENC

PUBLIC HEALTH

Cheese Biscuit May Aid Health in Asia

➤ THE DAIRY RESEARCH Institute at Palmerston North in the North Island has produced a highly nutritious cheese biscuit —the equivalent of half a pint of milk.

The biscuit will soon be distributed to children in newly developing countries. Samples have been sent abroad and already the full support of the Taiwan Government is assured.

The Taiwan Government plans to conduct evaluations by distributing the biscuit to selected children so that medical comparisons can be made. Research on the biscuits began after the New Zealand Dairy Board decided to distribute milk to school children in developing countries. Problems arose in getting milk overseas, keeping it fresh and, more important, getting the children to drink it.

Experiments began with making a cheese from whole milk but in the processing much of the nutritive value was lost. More research produced a cheese which retained the vital proteins. These cheese samples were sent to some countries, but teachers and children did not like handling the food, possibly because they were not used to the product.

Eventually it was decided to dry the cheese and present it as a biscuit. Dairy officials are optimistic about the potential contribution they may make to the health of youngsters in developing lands.

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TECHNOLOGY

Shipwreck Oil Held By Floating Fence

➤ DANGERS OF FIRE or pollution in harbor waters from leaking tanker vessels can be prevented by the use of a floating fence.

The plastic fence extends only a few inches above and below the surface of the water, but is enough to keep oil and gasoline slicks, which float on the surface, from spreading.

Two men in a small boat can put 2,500 feet of the fence in place in 10 minutes says the manufacturer, Neirad Industries, Saugatuck, Conn. The fence comes in nine-foot segments, each equipped with its own foam plastic float.

When the 661-foot tanker Baltimore struck a ledge in Boston Harbor recently, the fence, trade name Slickbar, was successfully used to contain gasoline leaking from a 400-foot hole in the ship's side.

The U.S. Coast Guard has recommended that such a fence be carried on all oil and gasoline transport ships.

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E FIELDS

CHEMISTRY

Polyurethanes Can Now Be Used In Many Products

A new method involving a new catalyst system has been discovered for making polyurethanes. These polyurethanes have electrical properties and other advantages for use in a wide variety of products for home and industry, such as calking mixtures, gaskets, dampeners and encapsulating resins for electronic components.

The new process discovered by the Houdry Process and Chemical Co., Marcus Hook, Pa. was described by Dr. Burton D. Beitchman at the American Chemical Society meeting in Philadelphia. He said it is based on triethylenediamine, the Houdry product widely used as a catalyst in the reaction by which polyurethanes are made. Along with triethylenediamine cocatalysts are used which set up a secondary reaction without altering the activity of the principal catalyst.

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PSYCHOLOGY

Parents' Maladjustments Reflected in Children

➤ VERY YOUNG CHILDREN frequently become showcases for the personal maladjustments of their parents, a Michigan psychiatrist said.

During the first year of his life, an infant communicates with the world by feeding, sleeping, crying and reaching for things he can touch and see.

Disruption of one or more of these "nonverbal" types of communication sometimes reveals in a general way, and sometimes in a very specific way, that a marriage is not a happy one or that "the mother or the father in a family has a psychological disturbance, acute or chronic, mild or severe," said Dr. Joseph Fischoff, professor of child psychiatry at Wayne State University School of Medicine, Detroit.

When the child is still very tiny, emotional disturbances usually channel through the mother in the form of anxieties. For instance, the woman who basically does not want a child may overcompensate by fussing and smothering her infant. As a result, the baby becomes very irritable.

In another case, the woman who is constantly anxious about her ability as a mother transmits the tension to her infant in the way she holds him and in her difficulties in feeding him. Here, the baby may cry too much and eat poorly.

Similar anxiety is transmitted through the woman whose husband does not want the child and who fears the dissolution of her marriage.

Dr. Fischoff observed from his experience that a rational approach to therapy can only be gained "when a woman is allowed to reveal the sources of her anxieties."

"Little or nothing is accomplished with attention only to the chronically disturbed infant when one or both partners in the marriage are disturbed."

Hospitalization of an infant often does away with his problems in short order.

Putting the child in the hospital may, in the end, be the only means of approaching a discussion with the parents about their disturbances, Dr. Fischoff said in Medical Times, February 1966.

As infants mature to school age, these maladjustments of the parents appear as a larger, more complex set of nonverbal signals.

Some of the more common signals include: aggression, withdrawal, "nervous tics," stealing, soiling, lying, cheating, fire setting, imagined illnesses, school phobia and stuttering.

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GEOPHYSICS

New Research Stations Probe Antarctica's Ice

➤ IN AN EXPANDING search to probe the icy secrets of Antarctica, scientists from 11 nations continue to set up new instruments to study the wind, ice, cosmic radiations, and rich animal and plant life of the surrounding oceans.

Of all the scientific programs, the United States retains the largest. The new Plateau Station, due to be finished in a few weeks, will be the seventh scientific base operated by the United States. This station is part of a program sponsored by the National Science Foundation and the U.S. Navy to transport, shelter, feed and sometimes rescue about 150 to 175 scientists and 2,500 to 4,000 assistants. About a dozen ships and a squadron of aircraft help in the yearly operation, which cotss about $28 million.

Four U.S. scientists and four assistants will be stationed at Plateau which is located on Queen Maud's land, on a lonely 13,000-foot ridge where no plant or animal grows naturally, and where the nearest human community is about 600 miles away. The station will be at an altitude of 11,500 feet, where temperatures sometimes plunge lower than 120 degrees F. below zero. Here men will study meteorology of the lower atmosphere, solar and other cosmic radiations, and will conduct limited medical experiments. The station will be operated on a round-the-year basis for two years.

Antarctica is the stormiest as well as the coldest place on earth. Yet this inhospitable land represents a unique example of international cooperation where men from 11 nations maintain stations, working peacefully together under a Treaty of Antarctica—Argentina, Australia, Belgium, Chile, France, New Zealand, the Union of South Africa, Russia, the United Kingdom, the United States and Japan.

The United States maintains five stations on the coast and two inland. Some of these are kept active all year round, while others close during the cold South Polar winter.

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MEDICINE

'Dip' Pneumonia Found More Benign Than Some

➤ A PREVIOUSLY UNCLASSIFIED type of pneumonia has been identified and has been found to be more harmless than others among the chronic "interstitial" kinds.

It has been given the abbreviation 'DIP' which stands for desquamative interstitial pneumonia.

Five of 12 cases studied for 10 years showed better response to treatment than other "interstitial" types of pneumonia.

Shortness of breath, weight loss and unproductive cough are the principal symptoms. A clue to the disease came three years ago when an elderly patient's lung tissue was examined under a microscope. The tissue showed the effects of an unusual interstitial type of pneumonia that produces slight thickening of the alveolar walls with masses of large cells in the distal air spaces.

Symptoms disappeared and lung function improved when patients were given large doses of corticosteroids, but in some cases extreme side effects such as moon face, excess facial hair, uncontrollable diabetes or infections made it necessary to cut down or stop dosages. Stopping treatment caused serious relapses, however.

An attack of the disease following acute respiratory infection in half of the 12 patients and the finding of "inclusion" bodies in one case suggested a possible virus cause.

Dr. Edward A. Gaensler, on the staff of medical schools at Harvard, Tufts and Boston University, with Anne M. Goff of the Boston University School of Medicine and Clive M. Prowse, Lederle International Fellow at the Boston University School of Medicine, reported the study in the New England Journal of Medicine 274:113, 1966.

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OCEANOGRAPHY

Great Circle Sea River Probed in Pacific Ocean

➤ SCIENTISTS are probing the depth, origin and flow rate of the great circular ocean river that constantly surges around the edges of the Pacific Ocean.

This vast belt of moving water, sometimes 600 miles wide, affects in many unknown ways the weather and climate of Pacific shores, as well as the movements of fish, crabs, plants and other sea life.

The current flows west along the north edge of the equator, turns north at the Philippines to form the Kuroshio Current, then crosses the north Pacific and heads south along the Pacific coast as the California Current.

Recent reports on the origin and depth of the Kuroshio Current, the Pacific Ocean's equivalent of the Atlantic's Gulf Stream, were made by a Japanese ocean survey group. This is the first phase of a cooperative ocean current study coordinated by the Intergovernmental Oceanographic Commission, which is sponsored by UNESCO.

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