

CHEMISTRY

Xenon Trioxide Is Discovered At Oak Ridge

► THE FIRST KNOWN compound of the inert gas xenon—xenon trioxide (XeO_3)—that does not contain fluorine has been discovered and identified.

The discovery made by D. F. Smith at Oak Ridge Gaseous Diffusion Plant resulted from experiments to study the properties and structure of xenon compounds. Only in the last year have chemists been able to combine fluorine with xenon.

Xenon trioxide, a highly-explosive combination of xenon and oxygen, was formed by the slow hydrolysis of xenon hexafluoride, XeF_6 , by moisture. The white, transparent, non-volatile crystalline compound is explosive spontaneously wet or dry and by rubbing, pressing, gentle heating or when in close proximity to aqueous solutions.

There are no known practical uses for the new compound at the present time, Mr. Smith said.

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MEDICINE

Tiny Window Over Retina Shows Blood Flow in Eyes

► A TINY THIN GLASS window can now be placed over the exposed retina of experimental animals as a means of studying the blood flow in the eye capillaries.

Dr. Ephraim Friedman of the Harvard University Howe Laboratory of Ophthalmology showed scientists at the microcirculatory conference at Washington, D. C., how it was done with 16-millimeter movies.

The window is sewn in place and the circulation of the blood in the transparent retina is then studied microscopically with light transmitted through the dilated pupil.

Dr. Friedman told SCIENCE SERVICE that eventually this basic work may be of help in understanding the relationship of blood flow in eye troubles of human beings, such as the detached retina. Already it has been useful in understanding an eye disease produced in kittens, which is similar to that causing blindness in infants who have had too much oxygen.

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CHEMISTRY

No Steel Corrosion With Nuclear By-Product

► A CHEMICAL ELEMENT separated from used nuclear reactor fuels may keep steel from rusting, the American Chemical Society meeting was told.

The element, technetium, in small concentrations as the "pertechnate ion," can prevent rust even at high temperatures for extended time periods. This property can be used in steam-generating nuclear reactors, Dr. W. R. Gollhofer, Gaseous Diffusion Plant, Paducah, Ky., reported at Los Angeles.

An inexpensive convenient method for separating technetium from nuclear fuels has been developed by Dr. Gollhofer. Technetium is found during the production of

uranium hexafluoride from the spent fuels. It is separated by passing the mixture over a bed of magnesium fluoride that attracts only the technetium.

The price of purified technetium has been lowered from \$500,000 per ounce to \$2,500 per ounce by this method. As improvements in purification are made, the price may be reduced further, Dr. Gollhofer said.

The lower price will allow more scientists to study the properties and applications of technetium compounds. Better knowledge of its properties may lead to specialized use of this element, Dr. Gollhofer reported. An alloy containing 50% technetium and 50% molybdenum has shown good superconductive properties and may be of immense value to space programs.

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ORNITHOLOGY

Whooping Cranes Now Flying Northward

► WHOOPING CRANES, the tallest birds in the United States, are leaving Texas soil for their 2,500-mile journey northward into Canada.

The exact route the rare birds will take on their long trip is not known, state officials of the Interior Department. The birds generally fly across Oklahoma, over Arkansas, Missouri, Kansas, Nebraska, the Dakotas, and on into Saskatchewan and Alberta Provinces in Canada to their special refuge at Great Slave Lake.

The birds fly so high that they are difficult to track, and exactly where they will come down to feed is not known. Everyone along the path of these white, graceful birds is warned not to shoot or harm them, as their numbers are still so few.

Only 28 of the world's last flock have been recorded this year, compared to 38 that started their spring migration this time last year.

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PHYSICS

Ultrasound Aids X-rays In Detecting Disorders

► ULTRASONIC WAVES, inaudible to the human ear, can supplement X-ray as a diagnosis technique, the American College of Physicians meeting was told.

Dr. Joseph H. Holmes of the University of Colorado Medical Center reported at Chicago that ultrasound has been used successfully in locating brain damage, in detecting heart valve narrowing, or stenosis, and for studying changes in such vital organs as the liver, spleen, kidney, bladder and breast, hard to visualize by X-ray.

Ultrasonic waves are generated by "pulsing" a barium titanate crystal at 400 to 1,000 times a second. Directed into the tissue at a frequency of one to 14 megacycles, the waves encounter areas of different density and echoes are reflected back. The same crystal then becomes a receiver for the ultrasonic echoes.

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IN SCIEN

FORESTRY

Durability of Redwood Caused by Fungus

► THE UNUSUAL DECAY resistance of redwood lumber is due mainly to a natural fungicide, the American Chemical Society meeting was told.

The fungicidal substance, named "sempervirin" after *Sequoia sempervirens*, or California redwood, has been isolated from the heartwood of the giant tree, Dr. Bela Balogh, University of California Forest Products Laboratory, Richmond, Calif., said at Los Angeles. Chemically, it is related to phenol, or carbolic acid.

Sempervirin causes an objectionable brown stain in the finished lumber. Dr. Balogh and his associates are studying the compound's chemistry in the hope of developing a method of pretreating green lumber to eliminate the stain.

Redwood is so decay-resistant that no commercial wood preservative is needed, Dr. Balogh said. Untreated redwood posts last many years. He found sempervirin to be destructive against a number of wood-destroying fungi, explaining why this compound makes the redwood so durable.

Dr. A. B. Anderson is collaborating in the research.

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NUTRITION

Rice Enrichment Better Formosan Troops' Health

► NATIONALIST troops on Formosa, or Taiwan, who formerly had a high percentage of vitamin and iron deficiency, have improved their health by eating enriched rice, the American College of Physicians meeting was told in Denver, Colo.

But civilians throw away the yellowish grains colored by riboflavin, or vitamin B-2, the most important vitamin needed by Asians, whose diet is mainly rice.

U.S. Army nutrition specialists were asked to help in the rice enrichment program by the Chinese Government on Formosa. Portions of polished rice, the diet mainstay of Oriental soldiers, was coated with thiamine, niacin, riboflavin and iron.

"The cost of this rice improvement process is only 25 cents per man per year," C. Frank Consolazio, chief of the bioenergetics division, U.S. Army Medical Research and Nutritional Laboratory, said.

A survey of 4,000 soldiers from all parts of Formosa after about two a half years showed that the vitamin deficiency, which had been 20% to 80%, the highest being in riboflavin, had decreased to less than 2%.

Mr. Consolazio said extensive education of the civilian population would be necessary to convince them that they should eat enriched grains.

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CE FIELDS

PSYCHOLOGY

Drinking Increases Sensuous Thoughts

► SOCIAL DRINKING increases sensuous thoughts while decreasing restraining thoughts, psychologists told the meeting of the Eastern Psychological Association in New York.

College men who drank liquor at a fraternity party had many more thoughts about love, sex and romance than those who had soft drinks. As the party progressed, the drinkers let up censorship of their imaginations.

Unlike the soft beverage drinkers, the students drinking liquor became less concerned about time. Being on time for appointments, having enough time to do what they wanted, or wasting time waiting for others became less and less important.

One or two drinks does not seem to be enough to cause these changes, Rudolf Kalin, Dr. David C. McClelland of Harvard University and Michael Kahn of Yale University told the meeting.

The fraternity members drank an average of 14.14 ounces of 86 proof alcohol. Those in a group that averaged only 4.07 ounces per person were not affected in the same way.

The general effects of social drinking are often neglected by psychologists who concentrate on the drinker's loss of intellectual abilities and physical coordination, the psychologists said.

For this study, a typical social situation was set up. The students were not aware that alcohol research was being conducted. Every 25 minutes, the party or discussion was interrupted and the students wrote sets of stories about pictures shown to them.

From the stories, the psychologists saw how the students' thoughts changed as they drank.

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ANTHROPOLOGY

Man's World Reversed By Pregnancy Cravings

► IT IS DEFINITELY a man's world in Laggala, Ceylon, but women have found a way to turn the tables: dola-duka.

Since ancient times, men have revered dola-duka, the intense pregnancy cravings of their wives.

While Americans make light of a pregnant woman's craving for strange foods and rare combinations, Laggala villagers know dola-duka is a serious matter, Dr. G. Obeyesekere, University of Ceylon anthropologist, reported in *American Anthropologist*, 65: 323, 1963.

In Laggala, it is a sin to deny a woman her cravings. The ears of the fetus will rot if a woman's cravings are not satisfied, it is

held. A pregnant woman may hold this threat over her husband to make him fetch and carry, wait on her and look after the children.

Escaping from the man's world once in a while helps the Laggala women live with it the rest of the time, Dr. Obeyesekere explained.

Women are considered lowly, impure creatures in Laggala society. They are dominated by their husbands and tied down by their children. The monotony of gathering firewood, pounding and cooking rice, and looking after the children is broken only rarely by visiting and festivals.

Laggala women usually crave the special foods that symbolically ease the strain of male dominance, including cookies and sweets associated with happy childhood; grapes and other expensive foods for which a husband has to spend a full day going into town; and kiroti, a food only men in their clubs can normally eat.

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MEDICINE

Medical Facility for Hearing, Deafness Study

► A SPECIALLY constructed medical facility devoted exclusively to hearing and deafness research—the Kresge Hearing Research Institute—will be formally dedicated May 20 at the University of Michigan Medical Center.

Clinical and basic research will be the function of the institute directed by Dr. Merle Lawrence. It will also play an important role in teaching physicians and scientists. When fully operational, it will accommodate 48 staff members, including investigators, assistants and supporting help.

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PUBLIC HEALTH

Pan American Attack On Health Problems

► PAN AMERICAN leaders plan a peaceful revolution.

A 20-nation task force on health met in Washington, D. C., to plan an attack on the problems of disease, sanitation, nutrition and health services.

Clearing up these ills is one of the goals of the Alliance for Progress to which these nations belong.

The main objectives, as listed in the Alliance's Charter of Punta del Este, are:

1. Control or eradication of communicable diseases.
2. Provision of water supplies and sewage disposal systems to 70% of urban and 50% of rural populations throughout Latin America.
3. Reduction of infant mortality.
4. Improvement of nutrition.
5. Training national health personnel and improving health services.

At the week-long conference the leaders set up guidelines, priorities and methods for achieving the objectives of the charter.

Their working assumption is that health plans are an important, inseparable part of social and economic progress.

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MEDICINE

Harmless Heart Murmurs Common in Children

► MANY CHILDREN are denied physical activity because of harmless, or innocent, heart murmurs.

Innocent murmurs occur in 25% to 50% of school children, Dr. Bernard L. Segal of Hahnemann Medical College and Hospital in Philadelphia told a Hahnemann symposium.

Innocent murmurs can be sorted out from organic murmurs by careful use of the stethoscope at the bedside without recourse to expensive or hazardous diagnostic procedures, Dr. Segal said.

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CHEMISTRY

Bureau of Mines Reports On Properties of Flames

► STUDIES of the fundamental properties of flames from Bunsen type burners have been summarized and interpreted by the Bureau of Mines to provide new insights and to guide future research into the theories and applications of combustion, the Department of the Interior reports.

Flames differ in a number of ways according to their source, manner of burning, turbulence and luminosity. When candle flames or gas jets were used for illumination it was desirable to have little specks of unburned carbon dancing in the flame to make a bright yellow light. However, when gas is burned sootlessly in a stove or furnace, the lack of luminosity indicates efficiency.

A Bunsen flame, almost colorless, is one of the most efficient and most easily studied types of flame. Facts learned while experimenting with Bunsen flames can be applied in studying or using any other efficient flame.

Since a roaring jet flame propelling a supersonic airplane or a fire in the shaft of a coal mine resembles a Bunsen flame, the turbulent burning of a gas-air mixture in a duct, the research contributes to a basic understanding of jet-engine flames and safety engineering problems in a mine shaft.

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DENTISTRY

70% Fewer Cavities With Phosphate-Fluoride

► STANNOUS FLUORIDE, now used to treat children's teeth, and a part of some toothpaste formulas, has a potential rival in a phosphate-fluoride solution that cuts dental decay 70%. "Promising" results of seven years' preliminary research were announced at the meeting of the International Association for Dental Research at Pittsburgh by Dr. Finn Brudevold of the Forsyth Dental Infirmary. The researcher said there was no reason why the phosphate-fluoride solution could not be put into dentifrices or mouth lozenges, although it might be a difficult chemical task to perfect the best mixture.

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