

## CHEMISTRY

**Heavy Nitrogen Isotope Being Made in Quantity**

**O**UT OF great tubes of glass longer than the width of five city lots, Columbia University scientists are producing quantities of heavy nitrogen isotope which are sufficient to supply many of the nation's laboratories with this hitherto rare gas.

Under direction of Prof. Harold C. Urey, Nobel prize winner of 1934 for his discovery of heavy hydrogen, Dr. Harry G. Thode has designed the new "factory" for the heavy nitrogen isotope. The device consists of 170 feet of glass column housed in three sections in the chemistry laboratory.

Starting the gas containing heavy nitrogen only to the concentration of four-tenths of one per cent., the Columbia scientists are able to produce each 24 hours about two grams of heavy nitrogen having a concentration of over 70 per cent. This recovery is equivalent to about three quarts of heavy nitrogen a day.

With these relatively large amounts of heavy nitrogen now being made, physicists and chemists in many laboratories will be able to extend greatly their research on the structure of atoms and molecules and be able, further, to use larger quantities of heavy nitrogen atoms as "tags" by which the intricate and little-understood processes of the animals and human body can be fathomed.

The same equipment can also be used to concentrate the heavy sulfur isotope of mass 34 and the heavy carbon isotope of mass 13.

*Science News Letter, September 10, 1938*

## AGRICULTURE

**Guerillas Blast Japan's Hopes for Cotton Crop**

**C**OTTON crop control in the U. S. A. is child's play compared to what is happening in the four Japanese-held provinces of North China. The guerilla government of these provinces, maintained in defiance of the army of occupation, has blasted Japanese hopes of using the conquered territory as a great reservoir of raw cotton, to free the home mills of dependence on American and other overseas sources.

The seriousness of the situation is disclosed in a report to the *Far Eastern Survey*, published in New York. The authority of the Japanese, as is now fairly evident, extends exactly to the limits of range of Japanese guns. As soon

as the soldiers' backs are turned, the peasants yield obedience and cooperation to the mandates of the "underground" guerilla government.

This unofficial but effectual organization last year permitted farmers in the occupied regions to export the crop they had already planted, to get some ready cash. This year the orders went forth to raise only one-tenth as much cotton as they did in 1937—and the supply which Japanese mill owners counted on vanished at its source. Instead, the farmers were instructed to plant grain for food, and the wheat crop, favored by good rains, is the largest in years.

Yet even this appears to be largely unavailable to the Japanese invaders. The farmers are reported to be boycotting the Japanese-controlled railway towns, necessitating the importation to such towns of Manchurian or Australian wheat. Wheat from the latter source has to be paid for, of course, either out of Japan's dwindling gold reserve or by exports of manufactured goods.

Although the guerillas are careful not to harm or offend the farmers who cooperate with them, they have no such tenderness toward such concentrated economic targets as coal mines, iron mines, and salt beds that have been seized by the enemy. Wherever they are able, they diversify their program of hazing Japanese troop detachments and supply trains by attacking and destroying these mining plants.

*Science News Letter, September 10, 1938*

## PHYSICS

**A. Cressy Morrison Prizes For 1938 Are Announced**

**D**O EXPLODING atoms keep the stars glowing?

This question, one of the outstanding riddles of modern physics, has been put before the scientific world with a \$500 prize to heighten interest in getting (or at least attempting) an answer. The New York Academy of Sciences has announced an essay contest, to be closed Nov. 1, the best paper to receive the A. Cressy Morrison Prize of \$500.

In addition to this prize, competition for which is open to all, there are two other A. Cressy Morrison Prizes of \$200 each, which are open only to members of the Academy, including new members who join before the Nov. 1 closing date. Essays for these competitions are to be on "a scientific subject included within the field of the New York Academy of Sciences and its affiliated Societies."

*Science News Letter, September 10, 1938*

**IN SCIENCE**

## PLANT PHYSIOLOGY

**Heteroauxin Promotes Growth Through Injury**

**S**UPPOSED to be a substance promoting growth in plants, the chemical known as heteroauxin has exactly the opposite effect of inhibiting their growth. But at the same time, if not so concentrated that it actually poisons the cells, it stimulates them to produce true growth-promoting substances of their own, to repair the damage that the heteroauxin has done.

These conclusions are derived from experiments on yeast cell cultures conducted by Prof. John R. Loofbourov and Sister Cecilia Marie Dwyer, S.C., at the Institutum Divi Thomae, Cincinnati. (*Science*, Aug. 26.)

The two experimenters used a technique which had previously been employed at the Institutum to demonstrate that when a cell is injured, as by ultraviolet radiation, it produces a growth-promoting substance or auxin. Addition of heteroauxin produced similar injurious effects, and stimulated auxin production in the same way.

The present experiments give strong support to similar researches conducted at the University of West Virginia by Prof. Leon H. Leonian and Dr. Virgil Greene Lilly, who worked on fungi and other lower plant forms.

*Science News Letter, September 10, 1938*

## CYTOLOGY

**Medal To be Awarded For Paper on Cell Theory**

**A** MEDAL will be awarded by the Mexican Society of Natural History for the best essay on the cell theory or a related topic to be submitted before Jan. 31, 1939, it is announced by Dr. M. Martínez Báez, president of the organization. All essays submitted in the contest are to be published in a special memorial volume commemorating the hundredth anniversary of the formulation of the cell theory by the German scientists Mathias Jacob Schleiden and Theodor Schwann.

*Science News Letter, September 10, 1938*

# E FIELDS

## ASTRONOMY

### Two New Satellites of Jupiter Are Discovered

**S**ATELLITES numbers 10 and 11 have been discovered for the planet Jupiter by Dr. Seth Nicholson, using the 100-inch reflector of the Mount Wilson Observatory. Dr. Nicholson was at work on the project from July 6 to Aug. 25.

He also observed the ninth satellite, which has been unseen for ten years. Dr. Nicholson discovered this satellite in 1914. With three Jovian moons to his credit, he is runner-up in this field to Galileo, who observed satellites numbers 1 to 4, in 1610.

*Science News Letter, September 10, 1938*

## ARCHAEOLOGY

### Stone Age Hunters' Camp In North Germany Explored

**H**UNTERS' life in northern Germany while Ice Age glaciers still blocked the Baltic and lay over the whole of Scandinavia and most of Russia has been pictured with considerable accuracy by a cooperative scientific team of archaeologists and botanists under the leadership of Dr. Alfred Rust of Hamburg.

The study was conducted in what is now a low meadow about 13 kilometers northeast of Hamburg. Just after the ice sheet had retreated, the meadow was an Arctic tundra, and in it was a small lake. Chance finds of Old Stone Age implements hinted that there had been a paleolithic hunters' camp thereabouts.

Dr. Rust made test digs to locate the suspected extinct lake, for he figured that the hunters would have had their camp near it. Presently he found the ancient bottom deposits. More extensive excavations uncovered the campsite, with numerous weapons, tools and other artifacts of horn and bone, as well as great quantities of bones representing the hunters' quarry.

The men were primarily reindeer hunters, the remains all indicate. They used bows made of reindeer horn, and round-pointed arrows tipped with bone or antler, not with flint. There is no evidence that they possessed either dogs or

sleds, as modern Arctic tribes all have. Other bones show that the hunters also knew horse, fox, rabbit, wolverene, badger, and several kinds of waterfowl.

The reindeer they hunted were not those of Arctic Europe of today, but rather resemble the species of northeastern Siberia and Arctic North America, known as the caribou. Furthermore, condition of bones and antlers shows that the hunters were there only during the summer. They were apparently nomads; there is some suggestion that they may have wintered in Moravia and Ukraina.

Studies by the botanists of the expedition, especially on the pollens embedded in the peat and muck deposits, date the campsite at about 20,000 years ago. The type of implements corresponds to the culture known elsewhere as Magdalenian. The age in years of this Stone Age culture has not previously been known with anything like accuracy.

*Science News Letter, September 10, 1938*

## ENGINEERING

### Army Engineers Study New Concrete Fortification

**U.**S. ARMY engineers, who witnessed in Washington the demonstration of a new method of constructing a concrete shelter, said to be bomb- and shell-proof, within a few hours after pouring of the concrete, are studying their notes and data to check on the inventor's claims and determine the place of the method in national defense.

No test shelling of a sample structure at a place such as Aberdeen Proving Ground is contemplated, the War Department stated, as sufficient data was gathered from study of the sample structure standing on the grounds of the National Bureau of Standards.

Invented by Karl P. Billner, a New York inventor, the method uses vacuum pumps to remove excess water from the concrete and so shorten its setting time. In addition, the vacuum inside the pouring forms and air pressure outside combine to compact the material. Comparison of the cost of the new method with that of standard methods is difficult because, although more machinery is required, less labor is needed.

No widespread application to American national defense is anticipated, however, since, after all, the United States has not yet experienced any need for heavy fortifications similar to those in Europe. If the method wins Army approval, notice of that fact will be made for use when the occasion requires.

*Science News Letter, September 10, 1938*

## AVIATION

### Device Thumps Pilot's Foot If He Forgets Landing Gear

**A** WARNING signal that automatically thumps the pilot's foot if the plane's landing gear is not in landing position when the engine is throttled down preparatory to landing, has been patented by Clinton W. Howard of Washington, D. C., and Harold L. Carpenter of Dayton, Ohio.

Covered by Patent No. 2,128,250, granted with the proviso that the United States government is entitled to its use without payment of royalty, the invention is designed to prevent landings with retracted gear. Although such landings are in most cases executed safely, they still damage the belly of the ship.

The invention was made, the letters patent reveal, with the requirements of modern high speed military aircraft in mind. In them the maze of instruments and the roar of the engines are such that the pilot's customary alertness is somewhat dulled on occasion to aural and visual signals, with the result that he sometimes attempts to land with landing gear up.

The warning device consists of an auxiliary tread attached to the rudder and brake pedals. When the landing gear is in landing position, an electrical circuit is broken. It is likewise open when the throttle is in such a position that the engines are delivering sufficient power to keep the plane in full flight. But if the wheels are up in "flight position" and the throttle is not opened wide enough, the electrical circuit is closed. This sets into operation a small solenoid motor that literally raps the soles of the pilot's feet.

*Science News Letter, September 10, 1938*

## ENGINEERING

### Image Projected on Wall Aids Lamp Improvement

See Front Cover

**O**LD-TIME movie projector lamps used to go out at crucial times because, for one reason, the coiled-coil filament of a 1,000-watt lamp would buckle and break if it didn't have room to expand and contract. That doesn't happen any longer. Now, by projecting the image of the filament many times enlarged on a wall, electrical engineers can measure with a ruler the exact amount of expansion and contraction and make allowances accordingly in the construction of the bulb.

*Science News Letter, September 10, 1938*