ASTRONOMY

Supernova Spotted In Southern Sky

➤ A SUPERNOVA, a star that suddenly blazed forth with the brilliance of 20 million or more suns, has been discovered in the southern skies.

Despite its high brightness, it is too faint to be seen without a large telescope because of its great distance of millions upon millions of light years. The supernova is in the constellation of Corvus, the crow, which is visible very low in the southern sky in the early morning.

The exploding star is magnitude 16.3 on the astronomer's scale. It was found by Dr. Guillermo Haro, director of Mexico's National Astronomical Observatory, Mexico City, on Feb. 13. Its discovery was confirmed the next day by Enrique Chavira of the same Observatory.

The supernova is in a galaxy of billions of stars so remote that the group is known only by its catalogue number, NGC-4887, which is at right ascension 12 hours, 53 minutes and declination minus 13 degrees, 55 minutes.

News of the supernova's discovery has been telegraphed to astronomers by Harvard College Observatory, Cambridge, Mass., clearing house for astronomical information in the Western Hemisphere.

• Science News Letter, 85:136 Feb. 29, 1964

ARCHAEOLOGY

Ancient Cotton Boll Sets American Identity

➤ RECENT DISCOVERIES of 7,000-year-old cotton boll fragments testify to the fact that this cotton was growing on American soil long before man could have carried it from foreign shores.

This refutes former theories of many scientists who state that American cotton used today in commercial industry was originally transported either across the Pacific Ocean or the Atlantic Ocean.

Now two segments of a cotton boll, excavated from a cave near Tehuacan, Mexico, prove their original American origin. These segments, about ¾ inch wide and 1½ inch long, were found in a floor level dating between 7200 B.C. and 5000 B.C., report Drs. S. Earle Smith Jr. of the U.S. Agricultural Research Service, Beltsville, Md., and Richard S. MacNeish of R. S. Peabody Foundation, Andover, Mass.

Three carbon-14 dates for this level of the Coxcatlan Cave are all around 5800 B.C., the scientists report in Science 143: 675, 1964.

Comparison of the ancient boll segments of the cotton species, *Gossypium hirsutum* L., with modern bolls shows no significant differences, state the scientists. This means that the ancient plant evolved naturally long before man became aware of the use of its cotton.

The special American cotton species became important particularly after the power loom was created in the late 1700's, stated Dr. Smith. Fibers of cotton grown in the Old World were not long enough for machines, and the longer-fibered, polyploid cotton from South and Central America was exported to Europe.

Analysis of plant remains recovered from the Mexican caves shows that cotton, maize, peppers, beans, squash, avocados and other plants were cultivated nearby as long as 7,000 years ago. Cotton appears both in woven material and in the form of crude fiber and boll fragments.

The earliest previous evidence of the use of cotton was found at Mohenjo-Daro excavations in Pakistan. These cotton fragments, dated at about 3000 B.C., indicate a well established knowledge of weaving.

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BIOCHEMISTRY

Sea Urchin Eggs Divide In Absence of Sperm

➤ SEA URCHIN EGGS have been made to divide as though fertilized, using heavy water instead of sperm.

Scientists at Brown University, Providence, R.I., have reported two strange and seemingly contradictory properties of deuterium, the double-weight hydrogen atoms in heavy water.

Deuterium not only has done what a sperm ordinarily does, but it has stopped division in living cells of animals and held them in a "frozen" state indefinitely.

Dr. Paul R. Gross and his associates substituted heavy water for ordinary water in cultures in which animal cells were grown, using mainly sea urchin eggs because they are easy to control and observe.

The process of "fertilization" without benefit of the male sperm is called parthenogenesis, common in some species but quite rare in nature for most higher forms.

The embryos produced in these experiments were disorganized and did not develop any specialized cells.

The "freezing" of cellular division by heavy water took place only in the cells of higher animals.

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ELECTRONICS

Tiny Magnetic Devices Replace Circuit Cards

➤ SMALL RING-LIKE, magnetic devices, the size of shirt buttons, are used in a new system that reduces the costs of military electronic systems while increasing reliability up to 400%.

The number of components required in the console display of a major weapons system is reduced from 70,000 to 7,000 by using the tiny rings developed by Sylvania Electric Products, Inc., N. Y.

The rings, called magnetic multi-aperture devices (MAD's), are wired together through two small holes on each side. They eliminate the need for intervening vacuum tubes, transistors or other semiconductor devices.

The Sylvania system is suitable for use with digital computers and data processing equipment.

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IN SCIEN

MEDICINE

Major Attack Launched On Shaking Palsy

➤ THE LARGEST single attack on the still incurable shaking palsy, or Parkinson's disease, is to be made at Columbia-Presbyterian Medical Center, New York.

U.S. Government support in the amount of $3 million has been promised, and the William Black Medical Research Building, named for the president of the Parkinson's Disease Foundation who donated $5 million toward its construction, will house the major research laboratories.

Dr. Richard L. Masland, director of the National Institute for Neurological Diseases and Blindness, which is financing the $3 million grant over a seven-year period, said this center will be a prototype for other centers to be developed in the neurological and sensory fields by this institute.

About 500,000 Americans have shaking palsy, a neurological disorder accompanied by uncontrollable trembling, muscular rigidity and a stumbling walk.

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PUBLIC HEALTH

Smog Pinpointed by Infrared Device

➤ HEAVY CONCENTRATIONS of air pollution can be pinpointed with a simple infrared device developed by two engineers at the University of California, Los Angeles.

"Once we know which blocks and sections of a community are smoggiest, we can forewarn city planners not to add any pollutant-producing industries or freeways in that particular area," Profs. Albert F. Bush and Herbert B. Nottage said in explaining the practical advantages of their research project.

The detector consists of an infrared light beam that passes through a column of air and registers the concentration of carbon dioxide on a sensing device.

Carbon dioxide, pushed into the atmosphere during any combustion process, is an indirect but highly reliable gauge for measuring air pollution. The normal background level of carbon dioxide in a sample of air is about 300 parts in a million, so that any higher figure represents the added amount of smog-producing combustion in that area.

Profs. Bush and Nottage have tested the detectors during the past two years and plan to take them into the field.

One stationary detector will be set up in Los Angeles, another in San Francisco, and a third in San Diego. A fourth detector will be carried throughout California in a mobile unit, measuring smog concentrations above parks, traffic intersections, industrial plants, and residential areas.

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CE FIELDS

SURGERY

Infants' Heart Disorder Helped by Rare Surgery

➤ A HEART DEFECT of babies only weeks old is reported repaired in one operation instead of two by three University of Michigan doctors.

The heart disorder known as a ventricular septal defect is caused by a hole between the two lower chambers of the heart, which disrupts normal blood circulation and retards the child's growth if allowed to go uncorrected.

Up to the present only temporary repairs could be made because the child's heart is so tiny when the harm begins. Final correction was postponed until the baby was older, larger and stronger.

Twenty-five of their infant patients, however, survived successful one-time surgery, the Michigan doctors told the American College of Cardiology meeting at New Orleans. The youngest baby was only ten weeks old. The children weighed from six to 24 pounds.

A miniature heart-lung machine was used in most of the operations to take over the tasks of "breathing" and circulating the infant's blood while the heart was opened and repaired.

Drs. Joan M. Sigmann and Aaron M. Stern of the pediatrics department and Dr. Herbert Sloan of the surgery department of the University's Medical Center reported the cases.

In addition to the 25 fully corrected heart conditions, eight cases with additional abnormalities or residual effects showed improvement by the single operation, the doctors said. The best age for surgery was between six and 12 months.

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GEOLOGY

Rocks Yield Water In Moon Living Rehearsal

➤ WATER IS BEING squeezed from hard, solid rocks in a preview of how men may drink on the moon.

Researchers at the Boeing Company, Seattle, are daily producing water from ordinary rocks.

Lunar expeditions will be able to carry water and oxygen along for short trips, but for a longer stay, requiring large quantities of water and oxygen, the simplest solution would be to devise some means of extracting both from materials expected to be found on the moon.

There is considerable evidence that the moon's crust is composed of basaltic rock, similar to that found in the Seattle area. Some of that rock is now being used in experiments to produce water.

Experimental equipment has been built to heat crushed rock, reduce it to rubble and in the process produce about three percent of its weight in water.

The heat first evaporates any surface water in cracks and crevices. Then at higher temperatures the components of the rock begin to break down and more water, which has been trapped in the crystalline structure of the rock, is released.

A third step is the result of the fact that rocks are made up largely of oxides. They can be decomposed by passing hydrocarbons over them at high temperatures. Water will form when the hydrogen and oxygen combine as a result of this reduction.

Even though the experiments are just beginning, it is already apparent that water in reasonable quantities can be extracted from almost any rock, the Boeing researchers point out.

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BIOCHEMISTRY

Cancer Stopping Seen By Combination of Drugs

➤ CANCER GROWTH and cancer inhibition through combination drug treatment were reported in February in a series of lectures at southwestern colleges and universities.

Dr. Norman H. Cromwell, professor of chemistry, University of Nebraska, Lincoln, delivered the lectures, sponsored by the Society of the Sigma Xi, first of which was at the University of Arkansas Medical Center.

The search for cancer growth stimulants that would cause cancer cells to destroy themselves has led to tests of drugs that promise success in sensitizing tumors.

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MICROBIOLOGY

Turkey Cancer Spread Caused by Virus

➤ ONE TYPE of cancer in turkeys has been shown to spread, or metastasize, through infection by a virus, two scientists have discovered.

Although no human cancer has yet been shown to be caused by a virus, it is hoped that specific types of virus-caused cancer, both human and animal, can be treated by anti-viral drugs eventually.

Until now scientists have generally believed that tumors grow by cell division and that the enlarging tumor invades neighboring normal tissues. Cancer cells, according to this belief, drop off the original tumor and migrate in lymph fluid or the blood to far parts of the body where they grow into colonies, or metastases.

In the case of a Rutgers University turkey experiment, using *Rous sarcoma* virus, the infected cells were shown to be victims of the virus and were not themselves malignant.

The research, supported by the American Cancer Society, was done at the Rutgers' Institute of Microbiology, New Brunswick, N. J., by Dr. Vincent Groupe and Dr. Victor V. Bergs, now of Stanford Research Institute in California.

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MEDICINE

53% of Heart Victims Survive Five Years

➤ YOUR CHANCES of living at least five years after your first acute heart attack are better than even. What is more, you may get rid of other circulation ailments if you live through the attack.

A New York heart specialist told the American College of Cardiology in New Orleans that a followup on 511 survivors of acute heart attacks showed 53% of them still alive after five years.

Twenty-nine of those who died during the study succumbed to non-cardiac illnesses, Dr. Benjamin A. Rosenberg, chief of the Special Cardiac Clinic at Kings County Hospital Medical Center in Brooklyn, N.Y., said.

Pre-existing high blood pressure had disappeared in 50% of the survivors after three years following the attack. Pre-existing angina pectoris, spasm of the coronary artery of the heart causing severe chest pain, was absent in 25% of the patients after a three-year interval, as well as after their discharge at the end of five years.

However, the percentage of deaths was significantly greater in those who had a previous history of heart disease, and particularly in those who had sustained one or more heart attacks before the acute one being studied.

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ENTOMOLOGY

Smoke That Calms Bees Shortens Their Lives

➤ AMMONIUM NITRATE smoke, used by some beekeepers to calm the bees when hives are being worked, can drastically shorten the lives of the bees.

Applied under the influence of heat in a smoker, ammonium nitrate produces nitrous oxide gas, the "laughing gas" which was one of the first anesthetics used in surgery.

Prof. F. E. Moeller, a U.S. Department of Agriculture bee scientist at the University of Wisconsin, Madison, and Augustine Jones, a biology teacher at a school in Aurora, Ill., conducted laboratory tests that showed the toxicity of ammonium nitrate smoke.

They then treated some yellow bees with amonium nitrate smoke and placed them in colonies with untreated Caucasian bees, so treated and untreated bees could be distinguished by their colors.

After about 10 days, only two-thirds of the treated bees remained alive in the colonies, compared with more than 90% of the untreated bees. A month after treatment, none of the treated bees remained, but the colonies still contained many of the untreated bees.

Burning ammonium nitrate could also release small amounts of nitric acid and ammonia into the hives, the scientists said, both of which are extremely toxic and could account for the shorter lives of the treated bees.

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