ANTHROPOLOGY

Man's First Fire Due to Decayed Grass Bedding

➤ EARLY MAN is believed to have obtained his first fire when he woke up finding his bed aflame from spontaneous combustion.

An early primitive man such as Pithecanthropus, who lived in China about 500,000 years ago and apparently knew the use of fire, may have used piles of trampled grasses for his bed. As he piled new sun-dried vegetation on top, the bacterial decomposition of the material at the bottom of the heap would create a certain amount of heat. This phenomenon is well known from compost heaps or haystacks. The heat thus produced could in time have become great enough to result in fire, D. C. Arnold of Bede College, Durham, England, believes.

He considers it unlikely that man first obtained fire from volcanoes, bush fires, lightning, sparks struck from stones or dry branches rubbing together in the wind, as is indicated from fire myths and the study of primitive cultures. The natural production of fire by friction or percussion is too rare to be readily found by members of small, scattered groups.

According to his theory, reported in Nature, 192:1318, 1961, other means of producing fire were developed much later either from observation of natural events or as a by-product of chipping and grinding in toolmaking.

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MEDICINE

Alcoholics Dependent On Others to Help Them

➤ ALCOHOLICS are extremely dependent, not only on drinking, but on other persons to help them.

Physicians read a report of a study of 61 alcoholics in the Journal of the American Medical Association, 178:1184, 1961. Two Texas psychiatrists said that as drinking progresses, the alcoholic becomes less dependent on persons close to him, turning to almost anyone for help.

The alcoholic looks for a "parental figure" to take over the responsibility of guiding and making decisions for him, Drs. Maurice Korman and Robert L. Stubblefield of the University of Texas Southwestern Medical School, Dallas, said.

Doctors also read a report on fat embolism, in which particles of fat form clots in the blood stream. Men are more commonly affected than women, and alcoholics more than nonalcoholics.

Drs. Otto E. Aufranc, William N. Jones and William H. Harris of the Massachusetts General Hospital, Boston, reported this study (p. 1187).

The possibility of tuberculosis should be considered in any poorly defined disorder of the blood, Drs. Janine Andre, Robert Schwartz and William Dameshek of the Tufts University School of Medicine, Boston, advised (p. 1169).

Treatment with antituberculosis drugs saved the life of one patient who had miliary tuberculosis along with abnormal activity of blood-forming bone marrow cells, the physicians reported. Another patient with a blood abnormality developed a type of TB that responded to isoniazid and streptomycin.

You can "set your mind" to waking up at a certain hour just like you set your alarm clock, Dr. Jack Arbit of the department of psychology, Northwestern University Medical School, Chicago, told a Pennsylvania physician in the questions and answers section of the Journal (p. 1199).

The explanation goes back to early infancy, Dr. Arbit said, in which a number of cues are associated with various times of the day, and the sleeping and waking cycles. One cue highly correlated with the depth of sleep is body temperature.

"One might hypothesize, therefore, that in going to sleep a person may 'set' the number of hours he might like to sleep, and when a stimulus such as body temperature associated with this number of hours or depth of sleep occurs, there is a downward firing from the cortex (outer layer of the brain) to the wakefulness center," the psychologist explained.

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PHYSICS

Heavyweight Methane Formed in Bomb Tests

➤ METHANE containing the triple weight hydrogen known as tritium is formed in the fireball resulting from hydrogen bomb explosions, a United States scientist reports.

Dr. Richard Wolfgang of the University of California, San Diego, states the amount of tritium in methane (marsh gas) has been found to be considerably higher than expected. The tritium, he believes, comes from "the testing of nuclear devices."

Prior to this suggestion there was no satisfactory explanation for the fact that tritium occurred in relatively high amounts not only in atmospheric methane but also in atmospheric hydrogen and water vapor in the stratosphere.

Dr. Wolfgang suggests that the heavyweight methane is produced in the thermonuclear fireball, which he believes has a reducing atmosphere at its center. When the fireball core has cooled to about 5,400 degrees Fahrenheit, its diameter would be about 330 feet, Dr. Wolfgang calculates. During this stage it is unlikely that the large reducing core would mix with its oxidizing surroundings.

With further cooling, the fireball's contents would form molecules, Dr. Wolfgang reports in Nature, 192:1279, 1961. The tritium so formed would combine largely as metal hydrides, molecular hydrogen, water, ammonia and hydrocarbons. Many of these compounds are later oxidized.

Dr. Wolfgang says his suggestion could be checked in many ways, the most direct being to sample the fireball gases soon after they have cooled.

Dr. Wolfgang is on leave from Yale University, New Haven, Conn.

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IN SCIEN

PUBLIC HEALTH

Less Milk Contamination From Radioactive Iodine

➤ CONTINUED declines in contamination of milk with radioactive iodine from recent Soviet nuclear tests were reported by Dr. Luther L. Terry, Surgeon General of the U. S. Public Health Service.

Average iodine-131 levels for November, compared with October, had dropped in 41 of the 59 stations operated during both months by the Public Health Service in cooperation with state and local health agencies. At 11 stations, increases were noted, and at seven of the stations levels were the same for the two months.

The decline continued during the first week of December, Dr. Terry said.

"Preliminary analysis of levels reported through Dec. 8 shows that, with only a few exceptions, iodine-131 contamination of milk has dropped below 30 micro microcuries per liter and at several stations was so low as to be undetectable," the Surgeon General said.

He explained that these facts confirm an earlier report issued by the Department of Health, Education and Welfare, which found that levels of "radioactive iodine-131 in air, water, milk and other foods were not high enough anywhere in the country to justify general use of countermeasures."

Iodine-131 is one of many radioactive products formed from nuclear tests. It has a relatively short half-life of eight days, which means it loses half of its radioactivity during that period of time. Strontium-90, another nuclear bomb by-product, has a half-life of 27 years.

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NATURAL RESOURCES

Millions of Fish Die In Australian Waters

➤ A PHENOMENON known as the "red tide" is killing millions of fish off the coast of Australia.

Fishermen on the north coast of New South Wales reported millions of fish swimming on the beaches to die. When thrown back into the water, the fish struggled back to the beach.

A New South Wales state fisheries marine biologist, N. Williams, said the red tide was probably caused by a buildup of enormous numbers of plankton that produce chemicals poisonous to fish. About 150 miles of coast north of Sydney is affected.

Red tide is not uncommon off the Florida coast and has been known to occur in mild form in Australian waters. It is named for the rusty discoloration of water that accompanies the buildup of plankton.

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CE FIELDS

GENETICS

Many Chick Generations Sired by One Ancestor

➤ SEVERAL GENERATIONS of future chickens may be bred artificially from the same "ancestor" when scientists perfect a method for freezing chicken semen.

So far the best result obtained with frozen chicken semen was 35% fertility in eggs, Dr. Frank H. Wilcox of the University of Maryland poultry division, College Park, Md., reported.

He said the genetic results of such artificial insemination would be of great interest to poultry scientists. The colder the semen is stored the less it "ages," he said.

Another method for preserving the chicken semen now being investigated is cold storage, Dr. Wilcox said. Semen can now be stored for three days when diluted with sodium phosphate.

Preservation of poultry semen is particularly important in solving the problem of infertility, because a similar problem also exists with turkeys that are bred to a very great extent by artificial insemination. Results obtained with chickens would also apply to turkeys.

Some of the semen kept in cold storage at Maryland University has been sent to foreign countries interested in breeding American stock which may not be exported. American stock produces more eggs and the chicks grow more rapidly than other breeds.

Scotland and Israel both successfully inseminated other breeds with semen from American stock.

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SPACE

Army Installs Antenna For Project Advent

➤ WHAT IS believed to be the world's most accurate space communications antenna has been installed at the Project Advent ground station at Fort Dix, N. J. An antenna is also being installed at Camp Roberts, Calif.

Earth based facilities are one link in the Advent program to develop, launch, and test active-repeater microwave communications payloads in the 22,300-mile-high synchronous orbit. At that altitude satellites in circular orbit around the equator will travel at the same speed as the earth's rotation, thus appearing to hover in place.

The antennas will operate in conjunction with Advent satellites for transmission and reception of information at very high data rates. In addition, these antennas will have the capability of automatically tracking satellites in both the ultrahigh frequency and the very high frequency ranges. Telemetry will be received from the satellites, and command will be transmitted to accomplish specific Advent missions.

Stability is the important consideration because the aim of this 60-foot antenna must be accurate within 0.024 degrees. An antenna aiming error of one degree would miss a synchronous-orbit satellite by 385 miles.

To help achieve such pinpoint accuracy an 84-foot hole was dug 30 feet deep at the Fort Dix site, and packed with layers of 10,108,800 pounds of special concrete. On this base was constructed, the 65-foot tower, 190 tons on one-inch steel plate held together with three tons of welding rod.

Advent ground antennas at each site will be connected by 200-foot covered passageways to the operations building, which provide coverage for equipment and personnel in inclement weather. Operations at the ground station will be directed from the Advent Management Agency Headquarters, Fort Monmouth, N. J.

Initial tests in 1962 will be conducted with an active communication satellite in a 6,000-mile-high circular orbit with a period of approximately six hours, boosted by an Atlas-Agena B rocket. In this phase the power supply, attitude control, and tracking, telemetry, and command subsistence will be tested, and orbital control functions and communication tests will be performed.

Later launch will place Advent satellites to the synchronous equatorial orbit. Ultimately, Project Advent will prove the feasibility of such a system for instantaneous global communications through space to meet modern military needs.

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GENETICS

Tendency to TB Not Inherited

➤ TUBERCULOSIS shows no hereditary tendency, a genetic study of English twins indicates.

More than 2,500 pairs of twins were divided into groups of identical and fraternal pairs by three researchers in the Royal Hospital, Wolverhampton, England. This was done because identical twins are expected to have exactly the same inherited traits, while fraternal twins are expected to resemble each other no more than other brothers and sisters.

The investigators state previous studies had shown susceptibility to inheriting tuberculosis by identical twins in families where the disease was present. They cannot explain their findings.

Infectious hepatitis was another disease in which heredity appeared to play a part, again contradicting previous studies of twins.

In 11 of 12 diseases in which evidence of heredity was seen, previous studies showed similar results. The 11 diseases are: appendicitis, benign growth, chest infections, otitis media (inflammation of the middle ear), eczema, epilepsy, hernia, rheumatism, sinusitis, squint and varicose veins.

Dr. A. G. Marshall, Elspeth O. Hutchinson and Jillian Homsett report the study in the British Medical Journal, Jan. 6, 1962.

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RADIO

Standard Frequency Broadcasts Changed

➤ THE NEW YEAR has brought a change in the broadcasts of standard frequency transmissions. The change, too small to be detected by ordinary radio receivers, was necessary because of irregular variations in the speed of the earth's rotation.

At zero hours Greenwich Mean Time, Jan. 1, 1962, or 7 p.m. EST on Dec. 31, 1961, the standard frequencies transmitted were increased by two parts in one billion. This is two ten-millionths of one percent, and it is significant to those using specialized equipment in precise scientific work.

The change was announced by the National Bureau of Standards and the U. S. Naval Observatory, two Federal agencies that coordinate transmissions of time and standard frequency.

Astronomical observations made at the U. S. Naval Observatory have shown that the earth was rotating at a successively slower speed each year from 1955 to 1958. Since then, it has been rotating at a faster speed each year. Cause of this irregular variation is not known.

Time pulses and carrier frequencies of the standard broadcasts are locked together. The frequencies transmitted are maintained constant each year with respect to atomic time, but are offset from atomic time by a specified amount to provide time signals that correspond closely to time as based on the earth's rotation.

Transmissions of time and frequency by the United States are coordinated with those of Argentina, Australia, Canada, Japan, South Africa, Switzerland and the United Kingdom, and these countries will also change their broadcasts on Jan. 1.

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PUBLIC SAFETY

Safety System Prevents Chemical Explosions

➤ A SAFETY SYSTEM that suppresses an explosion before it occurs has been installed and operated successfully in explosion-prone chemical processes.

The new system developed in England detects an explosion and extinguishes it before it reaches the critical point. It has been successfully used in the Monsanto Chemical Co. plastics division plant in Springfield, Mass.

The system combines a pressure-sensitive sensor, an explosively actuated vent, a suppressor with a liquid suppressant and a high-speed isolation valve, all operating within a fraction of a second to extinguish the possible explosion.

Since an explosion requires several thousandths of a second to build up, the system can detect the initial reaction and activate the safety vent and the suppressor before the explosion takes place, Clayton B. Hammond, Monsanto Chemical Co. engineer, reported in Chemical Engineering, 68:85, 1961.

• Science News Letter, 81:25 January 13, 1962