

ANTHROPOLOGY

Sandals Show Long Occupancy of Cave

► TWO PAIRS of sandals found in the layers of refuse in Frightful Cave, in the state of Coahuila, Mexico, show that this cave was used as a home for more than 6,000 years.

Discovered where they were kicked off the feet of their prehistoric wearers, the sandals were dated by the radiocarbon method at the University of Michigan.

The older sandals were Agave scufflers, loosely and roughly made. They were worn some 8,080 years ago and were found at the bottom of the accumulated deposit on the floor of the cave. The other pair, warp fiber sandals, was found at the top of the deposit and were only about 1,770 years old.

The older pair is not as old as a pair found in Oregon in 1950. That pair was about 9,053 years old.

The Mexican find was collected by Dr. W. W. Taylor Jr. of Mexico City and the radiocarbon dates were found by Drs. H. R. Crane and James B. Griffin of the University of Michigan who reported them in *Science* (Nov. 7).

Science News Letter, December 6, 1958

ENGINEERING

Predict Practical Uses For Semiconductors Soon

► YOU SOON may be heating your house in the winter, cooling it in summer and getting your electric power from a single device, a semiconductor.

Within ten years, semiconductor research may have developed far enough so that heat-electricity devices for such purposes will be practical, Dr. Wayne W. Scanlon of the U. S. Naval Ordnance Laboratory reported.

Right now, he told the Washington Academy of Sciences, the Russians are using semiconductors to provide electricity in remote parts of the country. He described a small semiconductor generator that fastens around the neck of a kerosene lamp and converts the heat produced to an electric current sufficient to power a small radio.

In the United States, however, there has not been as great a demand for this method of generating electricity and our thermo-electricity research has, until recently, lagged behind that of the Russians. This is especially true in respect to applications and development. Transistor radios are perhaps our most extensive use of semiconductors.

There are several applications of semiconductors that would be useful in this country at the present, however, Dr. Scanlon said.

For example, it is possible to design a device suitable to use for freezing specimens for study in the laboratory. No water or other liquid is needed, he pointed out, only a relatively small quantity of electricity

and a suitable arrangement of semiconductor metals.

Although the efficiency of semiconductors has increased greatly in the past ten years, from approximately three percent to 15%, they still have some way to go before reaching or exceeding the 40% efficiency of the largest and best power generators now in use. There is no theoretical reason, Dr. Scanlon said, why semiconductors can not reach this rate of converting almost half the heat produced to electricity.

Until improvements are made, semiconductors will find their greatest use here in the laboratory or in solar batteries in space ships and satellites.

Science News Letter, December 6, 1958

PUBLIC HEALTH

Measure Cigarette Butts In Cancer Search

► SCIENTISTS of the British Medical Research Council are to collect thousands of cigarette ends off the streets, in restaurants and offices. They are attempting to find out the average length of the butt the British smoker throws away.

If substantially less than one inch is found, it will be taken as further support for the theory that excessive smoking causes lung cancer. If the answer is more than one inch, the whole theory may be thrown into serious doubt.

The question of the vital statistics of the wasted part of the British cigarette is raised as a matter of medical urgency by Dr. Cuyler Hammond, the statistics chief of the American Cancer Society. He raised it to try to explain why lung cancer in men is twice as common in Britain as in the U. S.

Dr. Hammond pointed out that Americans smoke more cigarettes than Britons, and they inhale to about the same extent. If smoking really is to blame, only one possible solution remains: the British consume more of the tobacco in each cigarette because they throw away a smaller butt.

After measuring thousands of butts discarded in New York, Chicago, Pittsburgh and Los Angeles, Dr. Hammond reported that the average American throws away about one and a quarter inches of every cigarette. This means that approximately 40% of each cigarette is wasted.

The length of the British butt is still unknown but research among the gutters of Holland has shown that the thrifty Dutch discard a butt only three-quarters of an inch long on an average. And lung cancer is particularly rife in the Netherlands!

The importance of the length of the butt lies in the fact that the smoke from the last part of a cigarette is far richer in tar than the first part.

Dr. Hammon admitted that the length of a butt can be deceptive because it may smolder after being thrown away and that filter tips complicate the issue.

If the mystery is not solved by the Medical Research Council's inquiry, doctors will have to look for other causes of lung cancer besides smoking, Dr. Hammond said.

Science News Letter, December 6, 1958

IN SCIEN

ASTRONOMY

Improved Method Fixes Hot Star Distances

► COMBINING telescopic discoveries and new mathematical computations, an improved method of measuring the distances and brightness of certain hot stars has been put into practice by Dr. George O. Abell, assistant professor of astronomy at the University of California at Los Angeles.

As a first step, Dr. Abell helped discover 86 new so-called planetary nebulae. Superficially resembling planets, planetary nebulae actually consist of gradually expanding shells of gases, ejected by hot stars.

The masses of the nebulae are tremendous, averaging some 60,000 times more material than the earth, and reaching 1,000 times the size of our entire solar system.

Such an impressive telescopic target, plus the special nature of a nebula's gases, enabled Dr. Abell to calculate, by a new mathematical formula, the light emitted by the planetary nebula. From the calculated light emission and the nebula's apparent faintness, he derived the nebula's distance by standard astronomical methods.

Since the star is usually at the center of its enveloping nebula, the final step was to fix the distance and brightness of the hot star itself.

Some of these stars, Dr. Abell believes, seem to belong to a class known as white dwarfs, stars believed to be gradually cooling off prior to dying. Dr. Abell discovered the 86 new planetary nebulae while taking part in the National Geographic Society-Palomar Observatory Sky Survey.

Science News Letter, December 6, 1958

ENGINEERING

System Enhances Images on Radarscope

► AN ELECTRONIC system that enlarges the blips or electronic pictures on radarscopes, and makes possible the use of small, relatively inexpensive target missiles to simulate enemy bombers has been announced by the Sperry Gyroscope Company, Great Neck, N. Y.

Known as SEE (Sperry Echo Enhancer), it consists of a Sperry traveling wave tube, a miniaturized power plant and an antenna, and weighs less than 20 pounds.

The system is made to be mounted within an aircraft or target drone, detect pulses from ground radars and send back signals of greater intensity to create blips of any desired size on the ground radarscopes. The target drones are then intercepted and destroyed by fighter planes or guided missiles.

Science News Letter, December 6, 1958

ICE FIELDS

ICHTHYOLOGY

Fisheries Research Pays In Successful Tuna Catch

► FISHERMEN looking for the albacore tuna threw away their crystal balls when it came to predicting where this year's heaviest catch would be. Experts at the California Department of Fish and Game knew where the elusive tuna would run.

Studies of sea water temperatures and currents, together with the cooperation of fishermen, made the predictions possible. Detailed information fishermen gave on previous catches helped solve the problem of locating the most productive fishing areas.

Department scientists predicted that albacore school groups would sweep coastward considerably farther north than in any previous year, bypassing a 100,000-square-mile area that has been highly productive for the last ten years. They pinpointed the area in which the tuna would appear and fishermen were ready outside the San Juan Seamount to harvest the first run of the 1958 season.

It is estimated that hundreds of thousands of dollars were saved, since commercial fishermen could remain in port until notified where the tuna would be.

Science News Letter, December 6, 1958

ENGINEERING

Infrared Device Helps Army Avoid Crevasses

► A SNOW-COVERED crevasse can mean injury or frozen death.

The Army Corps of Engineers now has developed an infrared device to help polar researchers overcome this ever-present threat of polar treachery.

Carried by aircraft over the white Arctic and Antarctic regions, the device sees and records on film the underlying ice cracks which are invisible to the human eye.

Dr. Henri Bader and Leonard Stanley, of the Corps of Engineers Snow, Ice and Permafrost Research Establishment (SIPRE), Wilmette, Ill., told SCIENCE SERVICE that the device is "a black box" containing optical, electronic and camera equipment. The incoming radiations are focused through optical lenses, amplified by the electronic system and fed into a scanning device similar to those used in television receivers. Images are recorded on the camera film and, like a TV screen, appear as a series of fine lines. Colder areas show up dark on the film and warmer areas light.

Large sections of the ice caps can be covered from the air and safe passages can be mapped out quickly for polar travelers.

Although one might hardly dream of

heat coming from snow and ice fields, it is just such warm emanations, weak as they are, that make the detection system workable. The heat, or infrared radiation, is given off by everything above the lowest possible temperature (about 459 degrees below zero Fahrenheit).

The theory was first proposed by B. Lyle Hansen, a SIPRE scientist, based on observations that the snow bridges over crevasses tend to breathe. Depending on outside barometric pressure and temperature, they inhale or exhale. The temperature just above the bridge is either warmer or colder than that of the surroundings.

An earlier electronic device developed by the Army Engineers is pushed ahead of a motorized snow vehicle and detects crevasses in time to prevent accidents. Its limitation, which is overcome by the airborne infrared system, is that it cannot easily map out the length, breadth and shape of the ice cracks.

Other SIPRE scientists involved in the developmental work are Dr. Jack N. Rinker and Robert Leighty.

Science News Letter, December 6, 1958

MEDICINE

Resistant Strep May Force Individual Care

► HOSPITAL nurseries may have to be replaced by private rooming-in units for the mother and infant in order to exclude drug-resistant bacteria from adjacent hospital areas.

A study of nursery contamination by antibiotic-resistant staphylococcus bacteria has indicated that newborn infants acquire the bacteria primarily from older infants, and not from hospital personnel. This finding was made by Dr. Valerie Hurst, of the University of California Medical Center in San Francisco, and reported to the International Colloquium on Resistant Infections meeting in New York.

A newly opened nursery at the University Hospital, said Dr. Hurst, became contaminated with drug-resistant staphylococci as soon as infants and nursing personnel were transferred to it from another nursery.

It was found that the phage patterns and antibiotic sensitivity of the bacteria within the new nursery were identical to those of the bacteria infecting the infants who were brought in. The patterns and sensitivity were different in the bacteria carried in the respiratory tracts of the hospital staff.

It was also found that the nursery contained about three times as many staphylococci as other hospital areas occupied by the nursery personnel but not the infants. The conclusion was that newborn infants scheduled to be placed in the nursery would be much more apt to be contaminated with antibiotic-resistant bacteria by the older infants moved in than by regular hospital personnel.

Rooming-in was said to be conducive to less contamination within the hospital and a lesser probability of carrying bacteria from the hospital to the home.

Science News Letter, December 6, 1958

BIOCHEMISTRY

Study Cholinesterase In Receptor Sense Organs

► THE DISCOVERY that the chemical cholinesterase is found in "rather large amounts" in the biggest sense organs of the skin is helping to explain how nerve conduction takes place.

More than 1,000 of these sense organs, known as Pacinian corpuscles, were analyzed, Drs. Werner R. Loewenstein and D. Molins of the department of physiology, Columbia University's College of Physicians and Surgeons, report. An average concentration of cholinesterase was found capable of splitting 16 milligrams of acetylcholine in one hour for each gram of corpuscle tissue.

This cholinesterase-acetylcholine reaction is believed necessary for excitation of a sense organ, converting an external pressure on the organ receptor to electrical conduction of the "feeling."

While the enzyme discovered in the Pacinian corpuscles is a form of cholinesterase, the scientists report in *Science* (Nov. 21), it is not the typical kind of acetylcholinesterase found in many excitable tissues.

The most interesting observation, Drs. Loewenstein and Molins say, was the uneven distribution of cholinesterase inside the corpuscle. Most of the enzyme appears to be localized in the nerve axon and ending, and in the thin hull of the core that surrounds the ending. The remaining tissue contains only a little enzyme.

Tests showed the amount of cholinesterase in this core section had an acetylcholine-splitting activity as great as that of cholinesterase found at nerve-muscle junctions.

Science News Letter, December 6, 1958

IMMUNOLOGY

Honey Bee, Snake Venom Protects Against Bacteria

► IF A staphylococcus gets you, one remedy might be to let a honey bee sting you.

Crude venom from the honey bee, the Australian black snake, the king brown snake, as well as part of the venom of the Australian tiger snake will protect mice against the deadly action of staphylococcus toxin, two scientists reported in *Nature* (Nov. 15).

All the venoms are strongly hemolytic which means they dissolve the red blood cells, releasing hemoglobin. Only the fraction of the tiger snake's venom that is rich in hemolysin protects mice against the bacterial toxin, E. A. North and Hazel M. Doery of the Commonwealth Serum Laboratories, Victoria, Australia, said.

Since the venoms also contain the enzyme phosphatidase-A which acts to produce a long-chain fatty acid, this may be the explanation for venom's protective nature. Previous research has shown some fatty acids neutralize test tube preparations of bacterial toxins.

Science News Letter, December 6, 1958