ARCHAEOLOGY

"Waterworks" Indicates West Coast Indian Site

➤ AN ANCIENT water system which may have helped support an Indian population of 2,000 has been discovered by archaeologists on San Nicolas Island, just off the southern California coast.

Fred M. Reinman, archaeologist at the University of California, Los Angeles, explored the waterworks site on the lonely, barren island. The site was originally discovered by Capt. J. G. Smith, former commanding officer of the Point Mugu Naval Air Station, Calif.

The water supply system, rather ingenious by aboriginal standards, was apparently constructed by Indians who occupied the island as early as 4,000 years ago, according to radiocarbon dating. Age of the waterworks itself has not been determined.

The water system was constructed to take advantage of the meager flow of a spring that percolates through a sandstone bluff. Two main channels are carved in a sandstone shelf at the foot of the bluff. One channel is 38 feet long, and the other five feet. Eight smaller feeder channels occur along the main channel to collect seepage over the shelf.

The layer of rock containing the channels is soft enough to be worked with stone tools. Peck marks along the ledge indicate such tools were used by the Indians.

A tidal flat adjacent to the site is rich in shellfish—abalone, limpets, crabs and the like. Such an abundant food supply and the rather elaborate water system indicate that this was an important dwelling site of an ancient Indian population.

• Science News Letter, 83:216 April 6, 1963

PUBLIC HEALTH

Normal Social Drinking By Alcoholics Challenged

➤ STAY ON THE WAGON—this is still the best hope and advice for alcoholics.

A controversy has been stirred up by the recent research of Dr. D. L. Davies, Maudsley Hospital, London, who followed 93 reformed alcoholics and found that seven had been drinking socially for seven to 11 years without getting drunk.

Experts from all over the world are questioning and disagreeing with these facts. These are some of the comments made in the Quarterly Journal of Studies on Alcohol 24:109, 1963.

1. It is "foolhardy" to lead alcoholics to believe they will be able to drink socially. The cases Dr. Davies presents are as "rare" and "different" as spontaneous recovery from cancer, Dr. Marvin A. Block, chairman of the American Medical Association's Committee on Alcoholism, said.

2. The recovered men may have been habitual excessive drinkers rather than "true addicts," Dr. P. H. Esser of the Alcoholism Consulation Bureaus for Amsterdam and Haarlem contends. There is not enough information in the Davies report to make this determination.

3. Out of hundreds of alcoholics treated, not one is known to have resumed normal drinking, although many have tried and failed, Dr. Ruth Fox of the National Council on Alcoholism said of her patients.

4. Most sober alcoholics do not desire to return to normal social drinking, Dr. Harry M. Tiebout, formerly of the Connecticut Commission on Chronic Alcoholism, commented. After years of sobriety they do not want to be "guinea pigs." They fear that one drink would plunge them back into the "rat-race of their alcoholism."

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TECHNOLOGY

New Technique for Strengthening Ceramics

➤ AN OLD TECHNIQUE for strengthening metals, "strain hardening," has proved to be a new techique for strengthening brittle ceramics.

Dr. Thomas H. Alden, a metallurgist at the General Electric Research Laboratory, discovered that pieces of magnesium oxide became many times stronger and tougher after they are alternately stretched and compressed. This material, which melts at 5,000 degrees Fahrenheit, has the structure, appearance, and many characteristics of rock salt.

The "cyclic strain hardening" technique raised the yield strength of magnesium oxide from its normal 12,000 pounds per square inch to 110,000 psi, at room temperature, with no loss in its original ductility. The fracture strength was also increased.

The brittleness of ceramics has limited their value in many applications and the discovery of a means of markedly improving both their strength and toughness is a significant one.

Commonly used methods of increasing the strength of ceramics have included making the material into polycrystalline form, with many small crystals, but this makes them extremely brittle. Likewise, solid solution hardening, in which impurities are deliberately introduced, lowers the ductility of the material. The new method is considered to be superior to both previous techniques.

Experiments conducted with zinc produced improvements in properties of the same order of magnitude as those done with magnesium oxide.

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COMMUNICATIONS

First Optical "FM" Communications System

➤ A COMMUNICATIONS system using a beam of light to carry information by frequency modulation, the first known, has been developed at the Westinghouse Defense Center in Baltimore. Most optical communications systems use amplitude modulation. With frequency modulation, wavelengths from ultraviolet through visible to infrared can carry signals.

• Science News Letter, 83:216 April 6, 1963

IN SCIEN

DENTISTRY

Tooth Decay Not Caused By Sweets, Study Shows

➤ EATING CANDY between meals, or eating regular meals with high-sugar content, cannot be blamed for tooth decay, a nine-year study shows.

For more than 70 years evidence has been conflicting concerning the relation of carbohydrates, which include sugars and starches, to dental caries.

A defense of sweets against undue blame for dental decay was presented to the International Association for Dental Research at Pittsburgh by Rosario H. Yap of the University of Oregon.

Beginning at age three or younger, 20 girls and 17 boys from a middle-class group having reasonably good dental care in a community without fluoridated water were examined twice a year. Once a year X-rays of their teeth were taken. Seven-day food menus were collected, with no attempt to restrict diet in any way. Every type of sugar-containing food, except fresh fruits, was counted.

Various statistical methods for analyzing the information showed no relationship between numbers of cavities and sugar consumption, Dr. Yap reported.

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NUTRITION

Atomic Food Preservation Destroys Vitamin C

➤ A POTENTIAL barrier to the use of atomic radiation in preserving food in the future has appeared in experiments in Boston. Radiation, from either atomic debris or atomic smasher, has been found to destroy rapidly the vitamin C in food.

Vitamin C is the important protective substance found in citrus fruits, berries, tomatoes, cabbage, peppers, other green vegetables and new potatoes. It keeps man and animals from getting scurvy.

The radiation effect, however, was reduced considerably when carbon dioxide replaced oxygen in the experiments, Dr. B. S. Narasinga Rao of Harvard University stated.

Under gamma radiation, ionization took place, breaking up a stable molecule into charged particles. When oxygen was present, radiation was particularly destructive of vitamin C, or ascorbic acid, in a water solution. But when the oxygen was replaced by carbon dioxide, the destruction was much less.

Vitamin C is necessary for the production of several essential materials—collagen, which makes joints strong, and adrenal hormones, which enable one to cope with stress, among them. It makes for firm blood vessels, healthy teeth, gums and bones.

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CE FIELDS

MEDICINE

Hope for Leukemia Cure Seen in Cancer Research

➤ MORE HOPE for victims of leukemia, cancer of the blood-forming tissues, than for persons with any other form of cancer, is predicted by the American Cancer Society from research progress on this disease.

Drugs have extended life as long as 14 months to acute leukemia sufferers who formerly would have died in four months. But the hope lies in discovery of the cause, believed now to be a virus by many scientists. If a virus is found, a method of prevention or cure can be expected.

Sixty-four grants in 1962, directly or indirectly related to leukemia, were supported by the society at a cost of more than two million dollars.

In its annual report, the American Cancer Society also emphasized the 50% improvement in uterine cancer death rate, due to the success of the Papanicolaou smear test.

Cigarette smoking continues to be emphasized by the society as largely responsible for lung cancer, expected to take the lives of 40,800 persons in 1963. At least 75% could have been saved if they had not smoked cigarettes, the society said.

In 1962, 459 grants were made to support research on various forms of cancer. This cost well over $13 million, including $1,097,000 in awards of the affiliated Eleanor Roosevelt Cancer Foundation. Following affiliation with this foundation, the society broadened its research to include international research fellowships and to finance laboratory facilities.

• Science News Letter, 83:217 April 6, 1963

METEOROLOGY

Never So High and Dry That Clouds Do Not Form

➤ METEOROLOGISTS for long have thought of the stratosphere as a part of the sky so high and dry that water clouds never form there. But clouds of doubt are gathering over that belief.

Recent observations, in fact, support a theory that all the water in our oceans was—and still is—formed originally in the stratosphere.

Two years ago by C. M. Turveill of Bristol, England, suggested this is so because hydrogen particles, blown by the sun's "wind," are trapped in the earth's magnetic field and then oxidize to water.

Stratospheric turbulence starts this water on its earthward trip, Ronald Firth, London meteorologist, suggested, a little later. The stratosphere begins roughly about seven miles up.

There is considerable change in the amount of water vapor throughout the stratosphere, according to readings made by hygrometers being sent aloft in balloons.

"The earlier concept of a uniformly dry stratosphere needs re-examination," now reports Dr. S. Rangarajan, Meteorological Office, in Nature, 197:1099, 1963.

Dr. Rangarajan, who works for the Poona, India, office, reports that water vapor "mixing ratios" vary not only at different altitudes, usually increasing with heights, but also at different latitudes and seasons.

• Science News Letter, 83:217 April 6, 1963

GENERAL SCIENCE

Report Outlines Federal Science Activities

➤ IT TAKES 600 PAGES to outline the Government's scientific activities.

In the most comprehensive report of Federal science organization since 1956, the National Science Foundation notes the following major developments:

1. An increased attempt to review and coordinate scientific and technical programs at the Presidential level.
2. Appointment of science administrators to Secretaries of Departments.
3. Expansion of international scientific activities.

The publication, "Federal Organization for Scientific Activities, 1962," is based on information obtained from the 40 Federal agencies involved in science. Departments and agencies in both the executive and legislative branches are included. The thick volume can be obtained from the Government Printing Office, Washington 25, D. C., for $3.50.

• Science News Letter, 83:217 April 6, 1963

SURGERY

Forks, Not Knives, Used In Brain Studies

➤ SCIENTIFIC table manners are changing. Forks rather than surgeon's knives are being used to study specific areas of the brain.

By inserting cooling forks into the brain, a wall can be built around any area scientists want to study, Drs. Robert Byck and Paul Dirlik of the National Institute of Mental Health, Bethesda, Md., have found.

The forks, made of hairpin loops of tubing, are inserted in the animal's brain. A motor-driven syringe pump circulates the cooling fluid, heptane. The area fenced off by the cold can be studied without the use of anesthetics.

Six cats have had the cooling forks in their brains for as long as two months. Cooling periods have lasted as long as 45 minutes. No damage to the nervous system has resulted from the insertion or the cooling, the scientists reported in Science, 139:1216, 1963.

The method promises to be useful in analyzing the brain mechanisms of learning and memory, in locating the sites where drugs are active, and in developing new techniques of brain surgery.

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TECHNOLOGY

Polystyrene Molecular Weight Standards Issued

➤ TWO MOLECULAR WEIGHT standard samples of polystyrene are now offered under the standard materials program of the National Bureau of Standards.

These materials, the first molecular weight standards for polymers to be made available, will be useful to chemists in the molecular weight characterization of industrial macromolecular materials used in the production of plastics, rubbers, textiles, and paper.

The samples have molecular weights in the region of 200,000.

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AERONAUTICS

Flight Test Program Aims at Flight Control

➤ A FLIGHT TEST program to develop flight control and display concepts for supersonic transport aircraft is being undertaken by the Federal Aviation Agency.

The pilots, made available by six major airlines, are performing up to four hours of instrument flying a day in Air Force T-39 jets at the Instrument Pilot Instructors School, Randolph Air Force Base, Texas. Their flight performance and subjective reaction under varying test conditions are under study. Detailed test data are recorded by airborne instrumentation.

The results of this investigation of new flight control and flight data display concepts will help in establishing design requirements for a supersonic transport which will require a sophisticated all-weather control system.

The program is being conducted jointly by FAA and the flight control laboratory of the Air Force's aeronautical systems division, Wright-Patterson AFB, Ohio. It is part of the Government-industry supersonic transport research program headed by FAA with the co-participation of the Department of Defense and the National Aeronautics and Space Administration.

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ANIMAL HUSBANDRY

Air-Conditioning Gives Cool Comfort for Sows

➤ NOW MOTHER PIGS are having their babies in air-conditioned comfort.

Four sows can be cooled simultaneously with a mobile unit that sends cooled air through cloth and spring ducts to their individual plywood boxes. Animal husbandmen at the Agriculture Research Center in Beltsville, Md., have devised this cool system to relieve their sows' distress as they give birth during hot summer days. Farrowing sows formerly have died because of the heat, but no deaths have been reported since the air-conditioning has been in use.

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