PHYSICS

Tiny Crystal Stores 2,500 Information Bits

➤ A TINY crystal with a whopping big memory shows "considerable promise" as a means for storing information for computers and switching systems, delegates to the American Institute of Electrical Engineers meeting in New Orleans were told.

J. R. Anderson of the Bell Telephone Laboratories, N. J., reported that barium titanate seems to have the best memory-storage qualities of the different crystals tested.

In experiments, he said, as many as 2,500 bits of information have been stored in a square inch of the crystal's surface only a few thousandths of an inch thick. The information can be deposited there with electronic pulses less than a millionth of a second long, and will stay stored for a long time.

The crystals consume no power while storing information, and they offer the possibility of working from low-voltage circuits such as would be found in electronic computers and switchgear using transistors. Transistors themselves are tiny crystals that can do many jobs now being handled by vacuum tubes.

In addition to barium titanate, other crystals studied were rochelle salts, potassium niobate and potassium dihydrogen phosphate, he said.

Science News Letter, October 25, 1952

PSYCHOLOGY

Deaf Baby Taught to Talk By Same Method as Birds

➤ A DEAF child was taught to speak by the same method used in getting a parrot to say "Polly wants a cracker." Success in applying bird-training methods to the teaching of a baby is reported by Prof. O. H. Mowrer of the University of Illinois, Urbana.

The little two-year-old girl was so hard-of-hearing that the only time she heard her mother's voice was when she was naughty and the mother shouted "No, no!" at her. As a result, the child displayed no interest in hearing words and would not use a hearing aid.

The mother was then advised to stop scolding the child in a loud voice. Instead she tried shouting only endearments and pleasant words. Soon the child became interested in words and wanted to hear more of them. She was persuaded to wear a hearing aid so that she could listen better. Within six months she was using words herself.

This is roughly the method used in teaching a parrot to talk. The first step is to "tame" the bird, to care for it, play with it, feed it and provide it with attention until the bird becomes fond of its human friend. During this process, the human speaks or whistles to the bird until the sounds are linked in the bird's mind with pleasure—they become "good" sounds. The bird comes to receive comfort or pleasure from the sounds themselves.

The next step is for the bird to imitate the sounds so that he can give himself pleasure. This sets the stage for his learning to talk.

The normal human baby learns to talk in much the same way. Good mothers keep their babies "bathed in sound" during most of their working hours. Even when they have to go into another room, they call to the baby frequently, reassuring him.

Science News Letter, October 25, 1952

VITAL STATISTICS

Average Life Nears Three Score and Ten

➤ THE AVERAGE length of life for Americans is now close to the Biblical three score and 10 years, and getting closer every year. Barring a major catastrophe, it will reach that figure before 1960, statisticians of the Metropolitan Life Insurance Company in New York predict.

The industrial population has made greater progress in the past 40 years in reducing its mortality and increasing its longevity than the general population of the United States, the life insurance statisticians point out. In 1911-1912 expectation of life at birth among Metropolitan industrial policyholders was six and one-half years less than that for the population as a whole. Now the two groups are on a par.

A new high of 68.42 years life expectation at birth was reached in 1951 by the company's policyholders.

Science News Letter, October 25, 1952

ENGINEERING

Develop New Techniques For Sampling the Air

➤ NEW TECHNIQUES for sampling the air we breathe to evaluate its health hazards are being developed at the University of California at Los Angeles.

Albert Bush, assistant professor of engineering, is seeking the answer to such questions as "Do size, structure or number of certain particles in the air constitute a hazard?", and "Where do such hazards originate?"

Preliminary research has been concerned with developing techniques for evaluation of atmosphere in particular places. Samples of particles in the air have been collected by instruments designed for the study and examination of the samples under the electron microscope.

Los Angeles air has yielded a multitude of varied specimens for study. They range all the way from virus-like matter to star-shaped crystals.

One phase of the investigation revealed that Los Angeles municipal incinerators discharge 1,000,000,000,000,000 particles into the atmosphere per ton of refuse burned.

Science News Letter, October 25, 1952

IN SCIENC

PHYSICS

Sixty-Inch Cyclotron Is Now in Operation

See Front Cover

➤ A NEW cyclotron is now completed and in operation at Argonne National Laboratory of the U. S. Atomic Energy Commission. It is to be used for the study of nuclear reactions and the production of radioisotopes.

The extremely intense beam of electrically charged particles which emerges from the instrument's acceleration chamber is shown on the front cover of this week's SCIENCE NEWS LETTER.

In operation, deuterium gas is fed into the acceleration chamber from which the air has been pumped. There the particles are given an electrical charge. Then they are attracted to one of the D-shaped parts of the accelerator. Reversal of the electric potential then drives them out of that Dee into the other one where another potential reversal drives them back. Successive reversals of current 22 million times a second speeds the particles round and round the instrument until they reach a speed of approximately 28,000 miles a second when they are permitted to emerge in the cyclotron's powerful beam.

Science News Letter, October 25, 1952

BIOCHEMISTRY

Cortisone Double-Edged Sword in Tuberculosis

➤ "IN TUBERCULOSIS, cortisone acts like a double-edged sword," Dr. Max B. Lurie of the University of Pennsylvania, Philadelphia, declared at the conference on cortisone and other adrenal gland harmones held at the New York Academy of Sciences.

The famous arthritis remedy suppresses inflammation. But while this tends to isolate the tuberculous infection from the rest of the body, it allows the germs to multiply locally, Dr. Lurie explained.

To make matters worse, the scavenger cells and other body defensive forces arrive too little and too late.

Increased adrenal gland function and cortisone stimulate the engulfing of germs by the body's scavenger cells, but the digestive capacity of the cells for the germs they have swallowed, as it were, is markedly reduced. This is true whether the germs are those of tuberculosis or pneumonia, streptococci or even red blood cells.

Moreover, Dr. Lurie pointed out, germs can accumulate in tissues without symptoms such as fever and toxemia which are suppressed by the hormone.

Science News Letter, October 25, 1952

E FIELDS

HERPETOLOGY

Live Albino Snake Captured in Illinois

➤ THE FIRST known albino snake of the plains garter snake type is being raised by Dr. David D. May of the University of Illinois. The snake's color varies from snowy white to pale yellow to pink. The normal black of the tongue is lacking.

Found within the city limits of Chicago's west side when newly-born, the albino has yellow stripes that are more brilliant than usual. The normal diamond pattern is outlined in pale yellow between the stripes, Dr. May reports, and the diamonds themselves are of a pinkish hue.

A normal snake of the same type of approximately the same age was found by Dr. May at about the same time as the albino. He hopes to raise both of them to maturity in order to try some breeding experiments with the albino, using the normal snake as the control.

Science News Letter, October 25, 1952

ELECTRONICS

Airway Patrols Check Electronic Flight Aids

➤ FEDERAL PATROLMEN are flying the 70,000 miles of national airways much as state officials in scout cars patrol American highways.

Unlike the highway patrolmen, however, they are little concerned with traffic on the airway routes but are much concerned with the ground-based electronic instruments that control traffic on the routes of airplane travel.

The planes used by airway patrols are equipped with special instruments to pick up all radio signals given out by radio-range stations as well as those needed for making instrument landings. They check the accuracy of such radio signals.

The sensitive checking instruments are installed and frequently checked at the aeronautical center maintained by the U. S. Civil Aeronautics Administration in Oklahoma City.

Every radio range on the airways must be identical in its operation and maintenance. Every instrument landing system must give the same signals for bad weather landings. Every one of the new omni-directional radio ranges that aid pilots in cross-country flights must be kept operating with courses true to within 2.5 degrees. To do this, the airway patrol, composed of veteran instrument pilots, fly the courses and make instrument landings to see that all instruments are working correctly.

Another job of the airway patrol planes is to locate electrical interference that sometimes affects radio airway aids. Such interference may come from a new barn, metal silo or bridge in the area near an omni-range. The remedy is usually much simpler than locating the culprit. CAA electronic engineers have not yet met a problem of this kind that they could not solve. About 85 patrol planes are used in this service.

Science News Letter, October 25, 1952

FORESTRY

Three Tropical Woods Immune to Ship Worms

➤ THREE TROPICAL woods immune to the ravages of ship worms have been found by William Ward of the Duke University Marine Laboratory, Beaufort, N. C.

Ship worms ruin dock pilings and small boats by boring into the wood. Although wood may be chemically treated to prevent such attacks, the process is expensive.

Of eight Cuban woods Mr. Ward tested for their resistance to ship worms by suspending in water, one was damaged heavily, four showed slight damage and three were not attacked at all. Their resistance, Mr. Ward says, may be due to wood resins that poison the worms.

The ship worm attacks by latching on to submerged wood with its tail, eating its way inward as it grows. The "undersea termites" reach a length of around seven inches in the Beaufort area, but they have been reported as long as four feet in some tropical waters.

Science News Letter, October 25, 1952

CHEMISTRY

High-Calory Food for Intravenous Feeding

➤ A STABLE glucose-alcohol solution which will supply more than 1,200 calories per liter when fed intravenously has been developed at the University of California at Los Angeles School of Medicine.

Solutions commonly used in intravenous feeding at the present time furnish only up to 400 calories per liter. This is not adequate to meet minimum energy requirements of patients, much less furnish extra calories needed in the healing processes. The new solution will do both.

Some solutions of high energy content have been developed previously, but all were unstable and could not be kept any length of time. The newly-developed solution can be stored indefinitely.

Developers of the new solution are Dr. John M. Beal, Dr. Frank Spencer and Dr. Jullian Smith of the surgical staff of U.C.L.A. and the Wadsworth Veterans Hospital.

Much of the investigation leading to the development of the solution was done at the Wadsworth Veterans Hospital. The research was supported by gifts from Don Baxter, Inc., and the U. S. Public Health Service.

Science News Letter, October 25, 1952

ARCHAEOLOGY

Ancient Civilizations Dated by "Slide Rule"

➤FOR DETERMINING time sequences in archaeological collections, a new chronological "slide rule" has been devised by two University of California at Los Angeles anthropologists, Drs. George W. Brainerd and W. S. Robinson.

Use of the new technique will permit a greater degree of accuracy in determining the chronology of ancient civilizations. It may make possible determination of events in ancient history in terms of years rather than centuries.

The device combines all chronologically significant factors into a relatively simple mathematical formula. It is particularly applicable to large masses of material uncovered in random, unstratified samplings.

The device is based on a common archaeological method of determining time sequence known as "seriation." Seriation reflects gradual but constant changes in cultural manifestations such as pottery and clothing.

Science News Letter, October 25, 1952

VETERINARY MEDICINE

Longer Lives For Pet Dogs

➤ DOGS, LIKE their masters, can now look forward to longer, healthier lives than their ancestors had.

If the puppy survives the first year of life and is not run down by an automobile, he can expect to live to the age of 11 or 12 years, whereas a decade ago his life expectancy was only seven or eight years. There are no official statistics on dog longevity, but the figures given are estimates by experts of Lederle Laboratories who make medicines and vaccines for dogs as well as humans.

Distemper once killed more dogs than many other diseases combined, but now there is a highly effective vaccine against it. A new vaccine against rabies has also been developed, and is said to give solid, lasting immunity to this dreaded disease. The new vaccine is a modified live virus vaccine that does not cause post-vaccinal paralysis, a reaction often as terrible as the disease.

The so-called wonder drugs of human medicine, such as sulfa drugs, penicillin, aureomycin and others, are helping in treatment of germ diseases that attack dogs. A drug developed to fight filariasis, a serious tropical disease that affects millions of humans, is used to fight heartworms and large roundworms in dogs.

There are about 2,500 animal hospitals today, each equipped to take care of 10 or more animals. At these hospitals, a sick dog may get a thorough examination including X-rays, blood test, heart test, diet test and almost every test his master might get if he were sick.

Science News Letter, October 25, 1952