



"MEMORY" CRYSTAL—Tiny crystals a few thousandths of an inch thick, made of barium titanate, can remember bits of information for an indefinite period. The fine electrodes carry the information, as electrical charges, to the crystals.

ELECTRONICS

Barium Titanate Crystals

► CRYSTALS OF barium titanate have been developed that can quickly memorize answers to 250 questions and spiel them off long afterward.

Developed by research scientists at the Bell Telephone Laboratories, the crystals help fill a need for remembering devices created by automatic machines. Only a few thousandths of an inch thick, the flat crystals receive tiny charges of electricity that represent answers the automatic machines will ask for later. A plus charge symbolizes "yes," a negative charge, "no."

Words, sentences or a series of numbers can be coded by using a large number of these symbols, just as the punched pattern in the old piano player roll can represent a piece of music.

Although the crystals may seem to have remarkable remembering power, they do not begin to approach the vast ability of the human brain. Electronic equipment approaching even imperfectly the capacity of the human brain would jam Grand Central Station with a maze of tubes, automatic switches, condensers, coils and wiring, it has been estimated.

The human brain, furthermore, can think. Crystals can only remember.

Remembering devices now used in telephone dialing systems require far more space than the equivalent system using barium titanate crystals. Because of this, telephone engineers believe the artificially grown crystals have great significance.

Barium titanate, a material with exceptional electrical behavior, was developed during World War II. When treated as a ceramic, or clay-like material, it resembles the porcelain of a kitchen sink. Scientists are particularly interested in the crystal form.

The sensitive atoms of barium titanate show a remarkably quick response to the slightest changes in pressure, temperature or electrical field. Even light, shining on a crystal of it, will cause the atoms to rearrange themselves.

Members of the Bell staff cooperating in the development of the crystals include J. R. Anderson and W. J. Merz.

Science News Letter, July 18, 1953

TECHNOLOGY

Silicone Rubber Coats Electric Wire

► WIRE AND cable insulated with silicone rubber have been approved by Underwriters' Laboratories for use in extreme temperature conditions. Silicone rubber insulation remains flexible at minus 60 degrees Fahrenheit, yet is satisfactory in most cases where temperatures soar nearly to 400 degrees Fahrenheit. General Electric's silicone insulation now is being used by Essex Wire Corp., Fort Wayne, Ind., to cover new types of wire and cable.

Science News Letter, July 18, 1953

TECHNOLOGY

New Detector Gives Iron the Bum's Rush

► TO MAKE sure that cows are fed hay—not baling wire, fence scraps, staples or broken machinery—three University of California agricultural specialists have invented an electronic system to give such tramp iron the bum's rush.

Chunks of metal can punch holes in the cow's second stomach, and can give the animal bovine traumatic gastritis, which farmers call "hardware sickness." These fatal bits of tramp iron often are fed to cattle in chopped hay.

John B. Dobie, Frederic C. Jacob and Leroy C. Kleist reported to the American Society of Agricultural Engineers in St. Joseph, Mich., that current tramp-iron removers, such as duct magnets, magnetic pulleys or air flotation schemes, do not seem to work well with hay or silage. The three agricultural experts decided to build a detector that could screen metal from hay.

Their device is an electromagnetic detector that reacts to bits of iron wire as small as one-half-inch in length shooting by a sensor coil as speeds of 10,000 feet a minute. A trap door about 20 feet down the pneumatic pipe snaps open in time to eject the metal from the hay.

Laboratory tests have revealed the method is "readily capable" of 99% effectiveness, or 100% with optimum adjustment. Although the detector still is in the experimental stage, the scientists predict it may be woven into farm machines of the future.

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ORNITHOLOGY

Moas Exterminated By Man Near 1300 A.D.

► THERE IS now more evidence that the moas, large flightless ostrich-like birds of New Zealand, were hunted to extermination by primitive men about 1300 A.D.

Food that was eaten those centuries ago and collected from the crop of a five-foot specimen of the *Dinornis* unearthed in a Pyramid Valley lake deposit gave this new clue.

A determination of its age as about 670 years ago was made by radiocarbon dating methods at Yale University by scientific team consisting of Monte Blau, Edward S. Deevey Jr. and Marsha S. Gross, reporting in *Science* (July 3).

A smaller species of moa, whose skeletons and even feathers have been found in early native campsites, existed when man came to New Zealand, but mystery has surrounded the date and cause of extinction of the larger *Dinornis* kind.

Radiocarbon is made in the upper atmosphere by cosmic rays transmuting nitrogen into the carbon form whose disintegration rate allows telling how old is any carbon-containing material.

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