

## PHYSIOLOGY

**Brain Waves Do Not Vary With Day-to-Day Moods**

**B**RAIN waves are consistent. Moods and mental activity and accomplishment may vary from day to day, but not the wavy lines on paper that tell scientists about the electrical energy that accompanies activity within man's brain.

The day-to-day consistency of a person's brain waves is reported by Drs. Lee Edward Travis and Abraham Gottlob of the State University of Iowa to *Science* (Feb. 26). These brain-probing scientists recently reported that one person can be distinguished from others by his brain waves.

Brain waves vary according to whether a person is sleeping or awake and working at mental problems or awake and just sitting idly with nearly "blank" mind. The latter condition is the one on which the Iowa scientists made their studies. Brain wave records taken day after day from the same person were so consistent that they could be identified as belonging to that person just as different samples from one record could be identified in the earlier studies. Presumably the same consistency will be found in a person's brain waves during sleep or mental activity.

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## CRYPTOGRAPHY

**American Black Chamber Documents Are Studied**

**T**HE secret writings of the embryo American Black Chamber—vintage 1776—have now come to light through the aid of chemistry and photography. And with the aid of a puzzling curiosity by Dr. L. Bendikson of the Henry E. Huntington Library at San Marino, California.

In the *Franco-American Quarterly*, published by the Yale University Press, Dr. Bendikson reveals his laboratory detective work to make visible the messages in secret ink which American agents in France, in the 18th century, sent to John Jay, first chief justice of the United States.

Sir James Jay, brother of John and an English physician, also wrote to his American brother with secret ink and, in fact, his formula for the ink was the one which the American used.

Technique of the writing, reports Dr. Bendikson, was to send a short, harmless breezy note to some person in Amer-

ica and then fill all the remaining blank space on the large sheet of paper with the invisible writing.

George D. van Arsdale, chemical engineer of Pasadena, discovered the 18th century secret ink formula and found that the agent in France wrote with tannic acid and that John Jay sponged the letters with ferrous sulphate. No process of fixing the invisible writing was used so that, with time, the writing turns blank again. The only external evidence was that the paper appeared to have been washed in some chemical.

Four letters were studied. Three addressed to John Jay and one written by him. Dr. Bendikson was able to reveal the contents of one letter by the use of ultraviolet photographs. Another letter, when exposed to ultraviolet radiations, assumed a deep purple color, obscuring altogether what little was otherwise perceptible of the hidden message. Dr. Bendikson then took recourse to the opposite end of the spectrum, the infrared region, and found, after a period of experimentation, that the best legible plates could be obtained by photography with oblique illumination, consisting of visible red and near infra-red rays.

Dr. Bendikson in deciphering a message in one letter which had been marked out with a pen, first made an enlarged photostat of the message. Then he examined the scratched lines, portion by portion, under the microscope. Here the difference between the strokes of the original writing and the heavier "staccato" strokes of the superimposed marks was emphasized. He was thus able to eliminate the latter on the photostat, leaving revealed the original message.

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## GEOLOGY

**New Island Suddenly Arises in Black Sea**

**A** NEW island suddenly popped up in the Black Sea recently, off the southwest coast of the Crimea. It is about 800 feet long and 35 feet wide, and its crest stands about 20 feet above sea level.

A commission of the Academy of Sciences of the USSR investigated the curious phenomenon. They found that a huge mass of rock from an undercut cliff had suddenly dropped to the sea floor, throwing the bottom into wave-like folds. The new island is the emerged part of one of these folds. Whether it will survive, or slowly sink into the sea again, geologists are at present unable to predict.

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**IN SCIENCE**

## ASTRONOMY

**New Comet Visible In Western Sky**

**A** NEW comet just visible to the naked eye in the western sky after sunset has engaged the attention of astronomers.

Astronomer A. Wilk of Poland discovered the new heavenly object Feb. 27 and Harvard verified its existence. It was eighth magnitude, was near the star known as "55 Piscium" when discovered, and was moving north about one degree a day. It will grow fainter, not more brilliant.

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## ZOOLOGY

**Coyotes Chew Fittings Off Ranger's Ski Poles**

**C**HAMPIONSHIP honors for hard-luck ski stories are claimed for a ranger of the National Park Service, on winter station up toward the northeast corner of Yellowstone National Park.

The ranger recently set about refitting two pairs of extra-fine ski poles. He wound them with rawhide, put on new points, washers, and loops. They were ski poles any man might be proud to sport at Lake Placid, or even in the Alps themselves. Finally he painted and stained them, and set them on the porch of his house to dry.

Next morning the ski poles were gone. Nothing was in sight but coyote tracks leading away from the house in all directions, and a few drag-marks left by the poles as the thieving little wolves carried them off.

Two hours' research resulted in the recovery of three of the poles. The fourth never has been found.

But what those coyotes had done to the new-furnished ski poles was plenty. They had stripped off every scrap of rawhide, loops, washers, and all, leaving nothing but the bare wood of the poles—and even that they had chewed in spots. A whole day's hard hand-work gone down the gullets of a gang of hungry thieves!

The ranger hasn't cooled off yet.

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# E FIELDS

ENGINEERING

## Mineral Plays Role of Boy Who Stuck Finger in Dike

**S**CIENTIFIC mineral counterpart of the legendary Dutch boy who stuck his finger in the dike and saved the Netherlands from disaster, was described at the meeting of the American Institute of Mining and Metallurgical Engineers. Engineers are already using the mineral to seal dams and the walls of reservoirs and the possibilities of use in levees along the Mississippi and Ohio Rivers cannot be disregarded.

The sealing mineral is known as bentonite, a form of clay, which has the curious property of absorbing from three to seven times its volume of water and expanding more than six times its original volume.

Oliver Bowles, U.S. Bureau of Mines, and chairman of the Institute's Industrial Minerals Division, told how a soupy mud is made of bentonite and forced, under pressure, into sand or gravel beds.

The slurry, as the engineers call it, coats the grains of sand or gravel, fills the spaces between them and makes the whole mass water-tight even under high pressure. When drying occurs the bentonite shrinks and clings tightly to the sand or gravel. But as soon as leakage occurs the bentonite takes up the water, swells again and reseals the entire mass.

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ENGINEERING

## Windmills Return to Keep Pipe Lines From Corrosion

**A**S THE shiny net of great power transmission lines grew throughout the country the doom of the windmill as a means of power for the farmer was forecast. Internal combustion engines providing a small power plant also served as an added menace.

But windmills are not dead in America and throughout Texas and adjoining states they have returned in ever increasing numbers. Their function? To

protect the vast pipe line networks from corrosion.

Under the catchy title of "Gone With the Windmill" the Industrial Bulletin of Arthur D. Little, Inc., points out this month that the windmill's return is in the form of motive power for electric generators and that pipe line corrosion is now being combatted, with considerable success, by this wind-generated electricity.

While it may sound fantastic to a layman, here is how it works out. Buried steel or iron pipe lines frequently pass through moist ground where the conditions for a certain type of corrosion are ideal. Little electrical circuits are set up between the pipe and the surrounding soil and even small electric currents will carry ions of iron away. It is estimated, for example, that a one-ampere current flowing for one year will remove some 20 pounds of steel. The trouble is that the current flows from the pipe to the soil. Change the direction of this flow of current and you should be able to stop this type of damage, known to the scientists as electrolytic corrosion.

With such a change of current, ions would still flow but they would come toward the pipe rather than away from it and they would consist of hydrogen gas that would form a protective coating on the pipe at the previous point of danger.

It is to create this auxiliary current, reversing nature's kind, that brings in pipe line windmills. Only a very low voltage current is needed and with fairly steady winds found in the oil regions of the Southwest the operation of the windmills is reasonably certain. Thus the almost obsolete windmill is again becoming a familiar mark on the landscape.

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ENTOMOLOGY

## Black Widow Gets Long Train Ride

**B**IG, hairy tropical spiders that ride as stowaways in bunches of bananas are not the only members of their tribe able to travel in that way. Dr. Dayton Stoner of the New York State Museum, tells in *Science* (Feb. 26) of a black widow that rode from California to Albany, N. Y., in a bunch of grapes. She was found by a youth named Richard Tortorice, who took her to the Museum. She lived there for more than a year.

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PUBLIC HEALTH

## Denmark Vaccinates For Whooping Cough

**D**ENMARK has begun to vaccinate all its children against whooping cough, hoping to add this disease to smallpox and diphtheria as ills from which little children need not die.

This news was brought to America by Dr. Thorvald Madsen, director of the Serum Institute, Copenhagen, and president of the Health Section of the League of Nations.

Whooping cough is the most serious disease of children in Denmark. It ranks ahead of diphtheria and scarlet fever. In a group of 1,000 unvaccinated children this disease killed 26. In a group of 3,900 vaccinated, there were only 6 deaths. Such figures have convinced Danish health authorities of the desirability of vaccination. The vaccine will be given as early as possible in cases of whooping cough which may develop. It has been found to lessen the severity and shorten the course of the disease.

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PHOTOGRAPHY-SPORT

## Camera Accurate in Clocking Finishes of Horse Races

**I**F YOU like to put down two dollars once in a while, you can have faith in so-called "camera finishes" where the results are determined photographically. An expert at the National Bureau of Standards (expert in science; not in horseracing) has just approved installations of cameras at race tracks as being accurate and reliable.

At the request of the New York State Racing Commission, Dr. Irvine C. Gardner made a study of the optics of the instruments and checked through the fairly simple requirements of installation which would provide true findings. Need for the study arose because some sports newspaper writers had been questioning the method.

Dr. Gardner found that with simple precautions the camera would be satisfactory and in all installations he examined, these precautions had been considered adequately.

"In other words," says Dr. Gardner, "the camera will tell you who won the race *after* the race is over, but I suspect some of these fellows are looking for a camera to tell them who won the race *before* it starts."

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