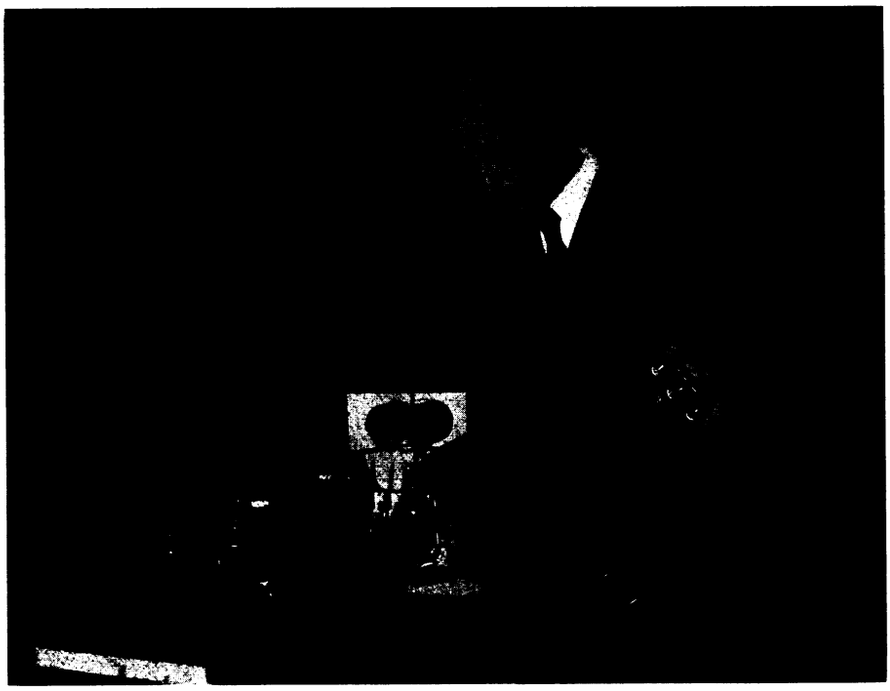

MACHINE WITH A MEMORY

Dr. A. W. Hull, of the General Electric Research Laboratory, demonstrated to the meeting of the National Academy of Sciences a machine capable of recording lightning, before, during and after the stroke. The machine with "premonition" or "memory" is also used in studying the failure of electronic tubes.

PHYSIOLOGY

Scientists Experiment With "Brain Waves" in Hypnosis

WITH eyes wide open, a hypnotized person can be persuaded that he sees nothing, and the minute electric waves that are constantly being produced by his brain will respond to the hypnotist's suggestion. They appear in the same ten-cycle pattern they have when the subject is in his normal state with his eyes closed. But only by the strongest kind of suggestion can the brain waves be changed from the "open-eye" to the "shut-eye" pattern.

This was one of the curious phenomena of the relatively new field of brain potential research reported at a conference of leading neuro-physiologists and other scientists held in Tuxedo Park, N. Y., at the private laboratory of Dr. Alfred L. Loomis. The research was conducted jointly by Dr. Loomis, Prof. E. Newton Harvey of Princeton University, and Garret Hobart of the Loomis Laboratory staff.

The brain potentials, or "waves," run along quite steadily at the rate of about ten a second, while a person sits or lies quietly with eyes closed, but still awake. Their pattern changes when he falls asleep, and the ten-a-second rhythm is suppressed if he opens his eyes and looks at any definite object, or if he indulges in concentrated imagination or thought while he still has his eyes closed. It was found exceedingly difficult to produce the ten-cycle pattern in the hypnotized man so long as objects were registering on his eyes, even though he could no longer "see" them.

In the same series of experiments, a young musician, blind since his birth, was also tested. His reactions were found to be no different from those of persons with normal sight.

Science News Letter, November 30, 1935

The picture of a star within the crescent moon may be art but it is not nature, an astronomer writing in *Natural History* points out, for all the stars are more distant than the moon, and so cannot appear in front of its darkened face.

PHYSICS

Machine With a Memory Records Lightning Strokes

A ROBOT machine with a memory, and which almost approaches the ideal of having a premonition of when lightning will strike, was demonstrated to the meeting of the National Academy of Sciences.

The machine, called a memory oscillograph, was described by Dr. A. W. Hull, assistant director of the General Electric Research Laboratory, Schenectady, N. Y.

"In recent years," Dr. Hull declared, "engineers have succeeded in developing lightning recorders with a reaction-time of less than a millionth of a second. Even this is scarcely short enough. The ideal would be a negative reaction-time, i.e., a device which should have a premonition of when the lightning is going to strike, and begin recording ahead of time. Such a device would be able to report the whole story of events before, during, and after the stroke.

"Impossible as it may sound, this feat has been accomplished. The new electrical detective, whose name is 'memory oscillograph,' may be depended upon to be on the job and ready with pencil and paper 1/25th of a second before the lightning strikes. As its name indicates, its uses memory as a substitute for prescience."

The apparatus is put on its job, Dr. Hull explained, some time ahead—hours, or even months—and records continuously what happens in its electrical circuit. It goes on erasing as fast as it writes, except for the last few lines.

When, at length, an important happening occurs like a lightning stroke, auxiliary apparatus, consisting of magnets and suitable vacuum tubes, opens a camera shutter and takes a picture of what is written on the oscillograph screen. The equipment does not need to hurry especially.

The records written just before the event are not yet erased, and the camera records the event as it does those later events.

"The 'memory oscillograph' is a very simple device," said Dr. Hull. "The robot which writes the record is a cathode-ray tube; its pencil a beam of cathode rays; its slate a plate covered with a thin coating of phosphorescent mineral called Willemite, which glows with a brilliant green light when the cathode rays fall on it, and continues to glow for about 1/25th of a second. That is the memory."

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