

PSYCHOLOGY

Electric Currents Picked Up From Head Show Brain Action

Scientists Hope That "Electroencephalograms" May Prove as Useful as the Now Common Electrocardiograms

BRAIN waves, electrical impulses accompanying brain activity, promise to allow physicians to probe harmlessly into the brain processes of healthy and ill patients in much the same way that heart function is now extensively charted in the familiar electrocardiographs.

The tapping for medicine of the electrical messages from the brain comes as the culmination of long years of research on the physiology of the brain and particularly the character of the electricity within the skull.

The latest work is by Drs. H. H. Jasper and Leonard Carmichael of the psychological laboratory of Bradley Hospital and Brown University, who followed up and confirmed in many particulars the researches of Dr. Hans Berger of Jena. The German scientist found that the changes in electrical potential connected with human brain activity may be magnified by running them through a vacuum-tube amplifying system similar to that used in radios and then using the enhanced current to operate an oscillograph which writes in light on a photograph a wavy line corresponding to the fluctuations of the electricity in the brain.

Drs. Jasper and Carmichael reported their findings in an article titled "Electrical Potentials from the Intact Human Brain" (*Science*, Jan. 11, 1935).

"Electroencephalograms"

"Electroencephalograms" the wavy line records of brain action are called, corresponding to electrocardiograms, which is the term applied to the familiar and similar records of heart actions.

Drs. Jasper and Carmichael declare that electroencephalograms may well "prove significant in psychology and clinical neurology."

It is not necessary to penetrate within the head to obtain the brain current records, although in some of Dr. Berger's earlier work it was thought necessary to insert needle electrodes through the skin. The patient simply wears on his head next to the skin some harmless pieces of metal that act as electrodes

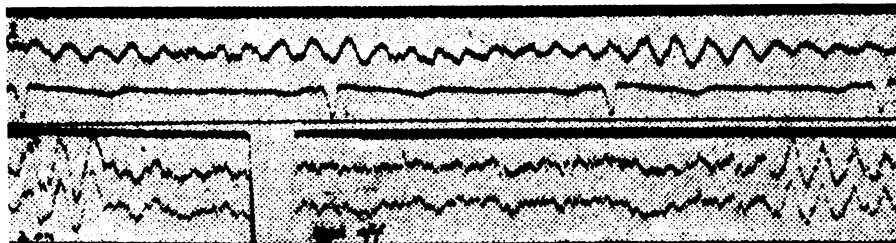
to pick up, without any sensation on the part of the patient, the brain currents.

Two kinds of brain waves were detected by Dr. Berger. The biggest waves Dr. Berger called alpha waves, giving to the smaller ones the name of beta waves. The alpha waves, Dr. Berger found, became smaller when the patient was under certain types of anesthetic, during an epileptic seizure, and when the person being studied did a "mental" problem or had his senses stimulated. The waves are their largest when the person is relaxed.

Alpha and beta waves were also detected by Drs. Jasper and Carmichael. In addition they found another type of wave which appeared when the subject's senses were stimulated by light or sound. Further experiments may show that waves of this type are irritation or stimulation waves.

The frequency of the alpha waves does not vary much from day to day in the same person, the investigators found. In one or two cases of illness, the frequency of these waves was very low.

Some normal persons, and especially sick persons, show different frequencies or lack of synchronism between the functioning of one side of the brain and that of the other. One girl, who was subject to "fits" or convulsions and who was quite ambidextrous, had an alpha-wave frequency of ten per second on the left side of her head and of but six to eight across the right side.



BRAIN WAVES

The photographic record made by the electric impulses accompanying brain activity. The top line shows the alpha waves in a relaxed subject. The second line shows the pulse. Below, the two records, taken across different parts of the head, show the effect of light stimulation. This illustration accompanied the report by Drs. Jasper and Carmichael in *Science*.

Others who have worked on these brain phenomena include Dr. E. D. Adrian, the British scientist who shared the 1932 Nobel prize in medicine. Working with Dr. B. H. C. Mathews, he found the waves in the brains of rabbits, while Dr. Pawdicz Neminski as early as 1925 found similar action potentials in dog brains.

Dr. Berger's work showed that there is no direct relationship between the brain waves and the pulse, and that even a momentary arrest of both breathing and heart beat has no marked effect on the brain potentials.

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DENTISTRY

Annual Fee for Dentistry Would Prevent Tooth Loss

A PLAN for dental care which would make unnecessary the loss of a single tooth was presented by Dr. Raymond Bristol, New York City dentist, to the First District Dental Society of the State of New York at its meeting in New York City.

The patient, under Dr. Bristol's plan, would pay his dentist a fixed fee each year and would report at regular intervals to have his teeth cared for. The dentist would regularly examine and clean the teeth and correct such defects as appeared within the period of the maintenance contract.

"One difficulty in putting the plan into operation is the sad state of the average patient's mouth when he presents himself to the dentist," Dr. Bristol said.

The cost of putting the patient's mouth into good condition could not be considered part of the maintenance contract.

Nine-tenths of all persons in moderate circumstances would be eligible and acceptable to the dentist under the plan, he concluded.

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