

PHYSIOLOGY

"Brain Waves" Hint Epilepsy Is Neurological Thunder Storm

"Electro-Encephalograms" Comparable to Electro-Cardiograms May Also Improve Use of Anesthetics

BRAIN waves" tapped electrically are providing a new clue to the mystery of epilepsy, the first fresh lead to this disease problem that scientists have had in a long time.

Drs. F. A. Gibbs, H. Davis and E. L. Garceau of Harvard Medical School reported to the American Physiological Society that an electrical hook-up to the brain producing wavy lines traced on paper gives a new clue to what goes wrong in this malady.

They find by this means that epilepsy is probably a neurological storm which results in great piling up of electrical discharges.

Epilepsy today afflicts almost as many persons in the United States as tuberculosis. It is characterized by sudden loss of consciousness and by fits.

Even between seizures, something is wrong with the activity of brain and nervous system.

The tracings of the small waves of electricity which come off from the brain are called "electroencephalograms" and are like the now familiar electrocardiograms which give physicians information about the action of the heart.

Studying these is like getting evidence of a thunderstorm simply from studying the electrical disturbances of the storm. Normally these small waves come off the brain at the rate of about ten per second. When a person is sleeping, in a faint, or loses consciousness temporarily in the strange sleep disease called narcolepsy, the brain waves are slowed down to about three to five per second and have about double the normal voltage.

In minor epilepsy, just before and during an attack, the brain waves come off about every three seconds and in a strange pattern of large round waves with a spiky wave between the round ones. In major epilepsy both fast and slow waves of much greater than normal voltage are found.

Even more important, the disturbance in brain activity as shown by these tracings of the electrical waves from the brain goes on even when the epileptic

patient is not having a fit or seizure and is in an apparently normal period.

These changes probably hold the clue to what is going on in the brain at the time of a seizure and if they can find just what the waves mean in terms of nervous activity, the Harvard scientists believe they may be able to find out what an epileptic seizure is and how it starts. If they find that in some cases it starts in a part of the brain which the surgeon can get at, there might be a chance that the part where the disorder starts could be removed. This prospect is far in the future, however, Dr. Gibbs emphasized.

At present no exact interpretations of the electroencephalograms can be made.

These patterns of brain activity may also lead to better use of anesthetics for surgical operations. Definite and char-

acteristic changes appear when different kinds and different amounts of anesthetics are used, another group of Harvard scientists, Drs. A. Forbes, A. J. Derbyshire, B. Rempel and E. Lambert, found.

The patterns are not the same when an animal is under ether, for example, as they are when he has been given avertin anesthetic.

Changes in the pattern of the brain waves also occur when the animal's sensory nerves are stimulated, and from this observation the scientists hope to find how the brain activity is linked with the world outside, for example, what happens in the brain when you feel a touch on your arm.

This investigation, with its promise of medical applications, is a continuation of research which has been carried on for the past few years by a number of scientists, notably in this country by Drs. H. H. Jasper and Leonard Carmichael of Bradley Hospital and Brown University. (See *SNL*, Jan. 19) As early as 1925, Dr. Pawdicz Neminski found these brain waves in dogs. Dr. E. D. Adrain, British Nobelist found such waves in the brains of rabbits. The Jasper-Carmichael research was performed on human subjects as was the Harvard research.

Science News Letter, April 20, 1935



RECORDING BRAIN WAVES

While the subject lies comfortably at rest, scientists can tap the electric waves that accompany his brain action and make a photographic record of any disturbances. This picture shows the set-up of Dr. Jasper and Dr. Carmichael for some of the pioneer research in this field.