

cities throughout the nation the latest developments and feats of applied science. A great silver-topped tent will

serve as an exhibit hall and supply the circus atmosphere.

Science News Letter, February 15, 1936

PHYSIOLOGY

Brain Waves Used in Tracing Activity of Brain Centers

Clue to Areas of Brain Deterioration in Those With Mental Disease May be Given by Variation in Waves

THE CHIEF regions of rhythmic activity in the brain can now be located roughly through science's latest researches upon brain waves, the electrical currents that originate in the human brain. Drs. H. H. Jasper and H. L. Andres, of Brown University's psychology department and the Emma Pendleton Bradley Home at Providence, R. I., have also used brain waves as pointers to defective and deteriorated parts of the brain not functioning as they should.

Not any closer to "reading minds" by brain waves, nevertheless science seems likely to use the new knowledge gained in understanding thought processes and in studying mental diseases.

The brain waves are not uniform throughout the whole brain, the investigators report. (*Journal of General Psychology*, January.) Two distinct types of brain waves, known to scientists as alpha waves and beta waves, have been studied. The alpha waves seem to predominate in the lower back part of the head, although under certain conditions some individuals show mostly beta waves in this region. The alpha waves are affected differently by light stimulation than are the beta waves.

In the normal person, alpha waves on the right side of the head are alike in frequency and amplitude to those in a similar region of the left side, although they may be somewhat out of phase, one lagging behind the other. This similarity is absent in a mental patient having one side of the brain diseased. Pictures of the electric waves led off the two sides of the brain of sufferers from brain injury, for example, following lead poisoning, showed a great difference between the activity on the two sides of the brain.

Brain waves of the other type, known as beta waves, are faster than the alpha waves. In any individual they have about twice the frequency and half the amplitude of that person's alpha waves.

They are more predominant in the area at the top of the head known as the Rolandic region. This is the part of the brain governing movement of the body. Occasionally outbursts of alpha waves are also found in this home of the beta waves.

In epileptic patients, the brain wave records during a seizure show what some scientists have likened to a "neurological thunder storm." Drs. Jasper and Andres have confirmed the finding that even when the patient is not undergoing a seizure, his susceptibility to them is betrayed by his brain wave record.

Sporadic seizure waves localized in the motor region of the brain, for example, when no seizure is present produce a similar pattern on the record paper to that seen in all parts of the brain during a generalized convulsion. The method of localized recording described by these authors permits the following of these seizure waves as they spread from one region of the brain to another.

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ARCHAEOLOGY

Find Tools Believed Left In America During Ice Age

STRONG evidence tending to show that man existed in North America before the end of the Ice Age is announced by Prof. Paul MacClintock, of the Princeton University Geology Department. The evidence is reported to be human implements found in the White River region of South Dakota and Nebraska and deposited there before the time of the last glacial advance.

In the field with Prof. A. L. Lugin of the University of Nebraska and assisted by Justus S. Templeton, a Princeton senior from Dixon, Illinois, Prof. MacClintock discovered last summer varved sediments in the bed of an extinct lake formed when the valley of

the White River was dammed by the last advance of the ice sheet. If these sediments are contemporaneous with the ice sheet, they figured that man-made artifacts found in or below the lake sediments would prove that man was there before the ice.

Accordingly, C. B. Schultz and his party from the Nebraska State Museum, under E. H. Barbour, dug below the sediments and found not only many artifacts, but scores of hearth-pits containing charcoal, burned stones, and burned bones of extinct animals. The pits, which are two or three feet wide and one or two feet deep, seem to have been used to preserve the fire from day to day. The artifacts are of the Yuma type.

While the evidence thus far uncovered is not absolutely conclusive, it is believed that another season will either prove or definitely disprove the hypothesis that man appeared on this continent before the end of the Ice Age. Older theories have leaned strongly to the belief that man did not arrive in North America until the last glaciers had melted sufficiently to allow a crossing from Asia.

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ARCHAEOLOGY

Cretan Images Confirm Truth of Ancient Writings

PEASANTS' discovery of a ruined building near Dreros has led archaeologists to unearth a remarkable temple, believed to be the oldest Greek temple in Crete.

The temple dates from the eighth century B.C., when Crete's own brilliant civilization had faded, and the Greeks were rising to be leaders of culture.

Outstanding among the temple's contents are bronze statues of two goddesses and a naked child god. These religious images were made by hammering thin plates of bronze to shape, possibly around a wooden core, and fastening the bronze in place with pins. Ancient Greek writers described such a process, but never before have archaeologists found actual statues thus hammered. Greek sculptures known today were made by casting.

The temple, measuring 30 by 20 feet, contains a square hearth still covered with ashes, and a stone base on which a wooden column once stood.

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Butterflies are reported increasingly scarce in British forests.