



### BRAIN WAVES WRITE THEIR RECORD

On this massive rotating drum, at the Loomis Laboratory, Tuxedo Park, N. Y., the minute fluctuating electric currents from the brain write their own record, after suitable amplification. Inset: parts of two brain-wave records; left, subject awake, right, subject sleeping.

#### PHYSIOLOGY

## Brain Waves Observed Better During Sleep of Subject

**B**RAIN WAVES, those recurring fluctuations in the minute electric currents that flow from the brain, can be studied to better advantage upon a sleeping than on a waking subject. The brain of the sleeper responds more readily and more certainly to such stimuli as the rustling of paper or the slamming of a door in another part of the house, even though there is no consciousness of their having occurred.

These are among the facts discovered in the course of a series of experiments at the Loomis Laboratory, conducted by Alfred L. Loomis, Prof. E. Newton Harvey of Princeton University, and Garret Hobart. (*Science*, June 14).

There is no doubt, the experimenters state, that these waves originate in the brain, and that they are distinct from muscle potentials and the results of movements. Different persons show quite different brain-wave records.

Records taken at night on sleeping persons show many spontaneous bursts of waves at certain hours, relatively few at other times. These often bunch themselves into "trains" lasting from five to twelve seconds, at intervals of from one-half minute to two minutes.

On an average, brain waves have a frequency of about ten per second, though this is somewhat irregular. Sev-

eral different patterns of brain-wave groups are shown by the records.

Regular snoring does not necessarily start the brain rhythms, but an occasional isolated snore may start a train of them.

During sleep, trains of waves appear which cannot be correlated with any detectable external stimulus, but which may be connected with internal disturbances of unknown origin.

Mr. Loomis and his associates have constructed a recording apparatus of a unique type, for use in these brain wave experiments. Formerly records were made on paper tape, but by the end of a "run" lasting several hours there would be a half-mile of the stuff, as tangled as a fishline. So they built a cylinder eight feet long and 44 inches in circumference, driven by a synchronous motor so that it acts as its own clock. It rotates once in a minute.

On the paper stretched on this huge drum two pens trace parallel lines. One line, in green, records the brain waves, as amplified in an elaborate vacuum-tube hook-up. Each wave makes its appropriate "wobble," and a whole set of them looks not unlike the record of an earthquake on a seismogram. The second line, in red, records all extraneous occurrences, such as movements in bed, loud noises in the room, etc. Either line

can be examined or photographed separately by using an appropriate light filter.

As the drum revolves, a worm gear moves the pens slowly along, so that they travel one foot an hour. On one "run" of the drum, therefore, all the brain waves arising during a whole night's sleep can be recorded if desired. And when the paper is removed, it provides a chart, eight feet wide by 44 inches high, of all occurrences, minute by minute. Each minute is represented by lines 44 inches long, each second by about half an inch of such line.

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#### PHYSIOLOGY

## Offensive Odor on Breath May Now Be Overcome

**Y**OUR best friend can now tell you! A lasting remedy for offensive breath odors seems at hand. Even the long-lingering odor of garlic yields to treatment devised by Drs. Howard W. Haggard and Leon H. Greenberg, of Yale's laboratory of applied physiology. (*Journal, American Medical Association*, June 15).

"The breath can be immediately and completely rid of the odor (garlic) by washing the teeth and tongue and rinsing the mouth with a solution of chloramine," the Yale physicians state. "The chlorine liberated in the mouth reacts chemically with the essential oils and deodorizes them. It is probable that many cases of foul breath from other causes would be amenable to the same method of treatment."

The solution of chloramine was made by dissolving one 4.6 grain tablet in a small amount of water. Chloramine is a well-known chemical available at drug-stores which is used in the treatment of wounds and for sterilizing drinking water.

In the Yale treatment particular attention was paid to the brushing of the tongue, for the papillae at the base of the tongue have long been under suspicion as the source of odor from retained food particles.

In their experiments Drs. Haggard and Greenberg first proved that the source of most obnoxious breath is not systemic but local. It arises, at least in the case of onions and garlic, solely from particles retained in and about the structures of the mouth. Air in the lungs does not taint the blood; the stomach is not at fault, nor is the saliva.

Having determined this, the physi-

cians set about either to remove or deodorize the particles. They brushed the teeth and tongues of their subjects with soap and water and rinsed their mouths. Still the odor remained.

Next they tried the proprietary mouth washes which rely on alcohol to sweeten

the breath. These only masked the odor for from fifteen to twenty minutes.

Finally they hit upon the chloramine solution treatment, which brings lasting relief when used in connection with thorough brushing.

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#### MEDICINE

## Put Olive Oil Into Veins to Help Babies Gain Weight

**T**WENTY starving little babies in Baltimore have been given a new lease on life by injections of fat directly into their veins.

The babies were not starving from lack of food but because they suffered from such severe digestive disorders that they could not get any benefit from nourishment fed to them by mouth. The new feeding method which put fat onto their emaciated little bodies and filled out their sunken cheeks was developed by Drs. L. Emmett Holt, Jr., Herbert C. Tidwell and T. F. McNair Scott of Johns Hopkins Hospital.

Olive oil is first mixed with lecithin from egg yolk. The mixture is then homogenized at 4,000 pounds' pressure to break up the large oil globules into such small particles that they will pass through the tiny blood vessels of the lungs. Finally it is sterilized and then injected into the babies' veins.

Each day for about a week the sick infants received a dose containing approximately the amount of fat that would be eaten in a normal diet for one day. After the second dose, the babies gained weight and began to improve.

Putting fat or oil into veins is a new venture in medical treatment. It has been tried a few times abroad but so far as is known the Baltimore physicians are the first to use it in this country. Dr. Holt and associates found after they had started the fat treatment that a similar method had been developed by a Japanese physician, Yamakawa.

The method can be applied to other conditions besides the severe digestive disorder of babies, Dr. Holt and associates believe. It should be useful whenever it is necessary to give the stomach and intestines a rest while keeping up the patient's strength. Dr. Yamakawa used it in treating stomach ulcer patients.

Physicians have for some time been keeping alive desperately sick babies and grown-ups, too, by injecting steri-

lized solutions of salt and sugar into their veins, but this is a much simpler procedure as the sugar and salt solutions mix readily with the blood. Fat and oil, however, do not mix any better with blood than with water. Physicians hardly dared to inject them directly into the veins, fearing disastrous consequences.

Salt and sugar and water, however, were not enough to keep some of the very sick infants alive, Dr. Holt and associates found. Even healthy persons need, in addition, fats and protein foods like meat and eggs. The problem was how to give these to the babies. The part of the digestive tract that takes care of fats was the very part that was too sick to do its job properly in these infants.

Fat to be put into the veins must be broken up into very fine particles. These particles must not settle out but remain suspended in the mixture until it has been sterilized and the blood has been able to carry it through the lungs and to the liver where it can be used as fuel to keep the body's fires burning or routed to fat storage depots in other parts of the body.

The Baltimore physicians borrowed the dairyman's method of homogenization by which butter fat is broken up into such fine particles that the cream will not separate from the milk. They added lecithin from egg yolk because this served to stabilize the emulsion. They tried the mixture first on animals and then on normal babies before giving it to the very sick infants.

They find olive oil the best to use but other kinds of oils or fats might be used for this treatment.

Now that they can put fat into the veins with good results, they hope a method will be found to give the other necessary kind of foods, proteins, for the benefit of patients who cannot digest meat or eggs.

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#### MEDICINE

## Leg Cramps Relieved By Gland Extract Injections

**C**ERTAIN disabling leg cramps can be relieved by a glandular extract taken from the pancreas.

How this new treatment helped older persons, incapacitated by leg muscle cramps resulting from hardening of the arteries in the legs, was demonstrated by Drs. Irving S. Wright, A. W. Duryee and coworkers of Bellevue and New York Postgraduate Hospitals, New York City, before the meeting of the American and Canadian Medical Associations.

Men who could not attend their daily business because they were unable to walk as much as five city blocks without an attack of leg cramps were enabled by this treatment to walk as much as a mile and a half. As a result they are able to keep on earning their livings.

The extract does not contain any of the insulin secreted by the pancreas. It does not cure the cramp condition, but relieves it. The injections are given three times a week and must be continued in order to keep up the relief.

Many persons who are going to chiropodists for treatment of cramps of the feet and legs are suffering from hardening of the arteries, although they do not realize that this condition is giving them the cramps.

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#### PHYSIOLOGY

## Breath and Blood Tests Do Not Prove Intoxication

**T**HE ONLY way to determine intoxication positively, as in the case of drunken drivers, is by examination of the brain tissue after death or by examination of the spinal fluid in living persons, in the opinion of Dr. A. O. Goettler of New York City. Dr. Goettler gave his opinion at the meeting of the American Society of Clinical Pathologists in answer to a question at the conclusion of his report on methods of detecting poison in children who had accidentally been given the wrong medicine or had themselves sampled the contents of the family medicine chest. Dr. Goettler and associates in the medical examiner's office of New York City do not believe that tests of the breath, blood or kidney excretion give definite evidence of intoxication. Such tests, he said, only show that "a man has partaken of alcohol."

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