

PHYSIOLOGY

Use of Brain Power

Using your brain takes little more energy than not using it, since most of the brain's energy is needed to keep "its circuits alive and sensitive."

► WHETHER YOU think or whether you do not does not show up very much in the amount of energy your brain uses.

Most of the energy your brain needs is used to keep it alive and ready for work.

Not even sleep reduces to any significant degree the amount of oxygen the brain uses for energy.

Unconscious states, however, such as coma and being under an anesthetic, unlike sleep, cause a greatly reduced oxygen utilization by the brain.

These are among new findings on the brain at work and asleep made by Drs. Renward Mangold, Louis Sokoloff, Eugene Conner, Jerome Kleinerman, Per-Olof G. Therman, Richard L. Wechsler, Charles Kennedy and Seymour S. Kety of the University of Pennsylvania.

The findings are from studies on healthy young men, aged 17 to 36, who volunteered to have needles inserted into an artery and a vein, electrodes for brain wave recordings inserted into their scalps, and a mask over their faces.

For the sleep studies they stayed awake 20 hours before the tests.

For the mental activity studies they did mental arithmetic problems such as: 38 plus 19 minus one divided by seven minus five equals what. Since the face mask prevented speaking the answer, they gave it by holding up the right number of fingers—three for this problem.

Even as you are, they were concerned about whether they would be poor at men-

tal arithmetic. This anxiety seems to have raised the rate of blood flow through their brains compared to volunteers who did no arithmetic. But there was no difference in brain blood flow or oxygen consumption in the same person when doing mental arithmetic and when not doing it.

If the human brain is viewed as a machine, it appears that, unlike machines doing mechanical work, the brain uses most of its energy "merely in keeping its circuits alive and sensitive." The presence of a message and whether it is rational and would serve a useful function add only an "infinitesimal" amount to the total energy load.

Looking at the brain not as a machine, but as a great number of functional units, it may be that increased activity and oxygen use in one group of units may be accompanied by decreased activity in others. This might not show in overall oxygen use and energy needs, or might not show with present methods of measuring these.

The mechanism for falling asleep has long been a scientific mystery. The only differences the Philadelphia scientists found between the volunteers who fell asleep and those who could not sleep were more carbon dioxide and less acidity in the brain blood of those who slept. This led them to conclude that falling asleep is somehow related to respiratory acidosis.

The findings are reported in the *Journal of Clinical Investigation* (July).

Science News Letter, August 6, 1955

CRIMINOLOGY

"Truth Serum" Misleading

► THE SO-CALLED "truth serum" is no more reliable for making people tell the truth than is a large shot of whisky, Dr. John M. Macdonald, consulting psychiatrist to the District Courts of Colorado, reported in the *Journal of Criminal Law, Criminology and Police Science* (July-Aug.).

The name "truth serum" is misleading on two counts, Dr. Macdonald pointed out. The drug used, formerly scopalamine or twilight sleep, but now usually a barbiturate, is not a serum and it does not always lead to the truth.

"The intravenous injection of a drug by a physician in a hospital may appear more scientific than the drinking of large amounts of bourbon in a tavern, but the end results displayed in the subject's speech may be no more reliable," Dr. Macdonald said.

The innocent suspect is not assured he

will be cleared of suspicion by using the truth drug. Persons under the influence of drugs are very suggestible and may "confess" to crimes they have not committed, especially if the police officer says something like: "You did steal the money, didn't you?"

The guilty suspect is not always induced to confess under the truth serum. If he can withstand competent and prolonged interrogation, he can usually withstand interrogation under drugs.

In fact, Dr. Macdonald has found, "The confident criminal relishes the prospect of examination under drugs. He welcomes the opportunity of making self-serving statements in the pseudo-scientific atmosphere of the truth-serum test.

"The only person likely to gain in these circumstances is the criminal who may

strengthen the effectiveness of his denials in the eyes of a credulous jury."

The suspect who fakes loss of memory is usually able to continue the deception under the truth serum, Dr. Macdonald has observed.

The only situation in which use of the truth serum actually aids justice is that of a person with a genuine loss of memory for whom the drug may serve to bring to light actual facts.

Truth serum, Dr. Macdonald concluded, should not be used either for the purpose of exonerating the innocent or to secure evidence against the guilty.

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MEDICINE

Babies Are Born With Weak Insulin Producers

► NEWBORN BABIES are comparatively well endowed with insulin-producing tissue, but apparently it is relatively weak in producing anti-diabetic insulin.

Studies showing this were reported by Drs. R. F. Santos, R. A. McCance and P. J. Randle of the University of Cambridge, England, in *Nature* (July 16).

After studying five healthy mothers and babies, they found that the mothers' blood plasma had highly significant insulin activity. Blood in the cord connecting mother with baby before birth, however, contained less insulin than maternal blood.

Previously it has been reported that the insulin-producing islets of Langerhans form a much larger proportion of the pancreas in newborn and unborn babies than in adults.

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ZOOLOGY

Caribou Life Expectancy Found From Jawbone

► THE LIFE EXPECTANCY of the Baren Ground caribou is 4.09 years. If he makes it that long, chances are he has 3.6 more years to look forward to. But at age 13, he will be a caribou centenarian.

A. W. F. Banfield of the Canadian Wildlife Service collected and examined jawbones from 292 caribou carcasses found over northern Manitoba and Saskatchewan and in the Northwest Territories to obtain these data. He determined ages of the dead animals from tooth eruption and wear.

From the distribution of ages among the carcasses, Mr. Banfield constructed a caribou life expectancy table, which he reported in the *Canadian Journal of Zoology* (June).

He found that the average mortality rate for the first ten years of life was 71%. The majority of deaths among the carcasses examined was due to hunters. Wolf predation caused a good number of deaths, as well as accidents such as drowning and disease.

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