

when patent number 2,231,929 was granted to Joseph Lyman for a radio airplane locator. The patent was assigned to the Sperry Gyroscope Company, of

Brooklyn, N. Y., which makes control mechanisms for airplanes and ships. (See SNL, March 8.)

*Science News Letter, June 28, 1941*

BIOLOGY

## Life and Death Closely Connected With Electricity

### Live Tissue Is Like B-Battery and Dead Tissue Like Burned-Out Generator, Engineers Are Told

LIFE and death are very closely connected with electrical activity, Dr. Robert S. Schwab, of the Brain Wave Laboratory of the Massachusetts General Hospital and the Harvard Medical School, told the American Institute of Electrical Engineers.

"In these days of super-sensitive amplifiers and recording apparatus," he said, "it is very tempting to define life and death in terms of electrical activity. Whether or not this concept is accurate, we can, on present knowledge, liken living tissue to a B-battery and dead tissue to a burned-out generator. The function of living tissue, however, is so closely allied with its electrical activity that knowledge of the latter has given us better understanding of the working of the human body."

There are four types of body electrical currents, he stated. One is a small direct current in which the cells act as a B-battery. Second is an alternating current wave that accompanies contraction of muscle tissue. It also occurs in connection with activity of nerve fibers. Third is the type "associated with the more highly developed types of contractile tissue," such as the heart. This is used to operate the electrocardiograph, important instrument enabling physicians to diagnose heart ills.

"The fourth type of body electricity," said Dr. Schwab, "is that associated with the complicated tissue that makes up the central nervous system of animals. Here, as the function is continuous during life, the ganglia and brain cell tissues are ever-active electrically and show no periods of rest in the manner of muscle and nerve. Each brain cell does not actually beat alone, but by a system of interconnections they keep each other stimulated to activity. These 'chains' of neurones make up the bulk of the

brain and spinal cord of man and animals."

The number of possible combinations of neurones, he stated, is represented by the number 1 followed by 2,783,000 zeros, which is greater by far than the number of electrons and other elementary particles in the entire universe, according to astronomical estimates.

These currents require extremely delicate recording equipment, but they show waves of different kinds which have been very useful to physiologists in studying the cells of the central nervous system.

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INVENTION

## Windshield Protected From Insect Attack

A TRIANGULAR screen of transparent plastic, mounted at the front of an automobile above the radiator grille, diverts currents of air around the sides and above the car. Insects are carried with the air, so they cannot soil the windshield and cause possible danger from obstructed vision. (*Henry Mfg. Co., Minneapolis.*)

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GEOGRAPHY

## Emperor Penguins Pictured On Antarctic Expedition

See Front Cover

NAVY photographer Charles C. Shirley of San Diego, Calif., waited six hours on the Bay of Whales in the Antarctic dawn temperature of 20 degrees below zero to secure the beautiful photograph shown on the front cover of this week's SCIENCE NEWS LETTER.

This photograph of the Emperor Penguins is an official photograph of the U. S. Antarctic Service.

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POLAR AIRDROME

Like lump sugar are these white building blocks of snow with which a working party are building a winter hangar for the small cabin plane at West Base. The picture, taken at 68 degrees below zero, is an official photograph of the U. S. Antarctic Service.