June evenings, "is representative of a class of fairly numerous stars, known as K giants, which differ in many ways from the normal, or dwarf stars, like the sun," said Dr. Gustaf Stromberg of the Mt. Wilson Observatory. "They are rather large, having diameters from 10 to 50 times that of the sun and their intrinsic brightnesses are equivalent to from 50 to 500 suns. They are much redder than the sun and therefore have considerably cooler atmospheres.

"The mechanism by which they generate heat must be quite different from that activating the sun and other normal stars, and their evolution may well have followed different lines. They are not in general found in star clusters in or outside the galactic system and seem to be peculiar to our own system, or even perhaps to that part of the system in which we are at the present time. They are quite distinct from the so-called supergiants, which are found in star clusters."

Science News Letter, June 28, 1941

Instrument Shows 'Flames'

RESULTS obtained with a new type of instrument for observing the fiery clouds of prominences in the sun's atmosphere were announced by Dr. Edison Pettit of the Mt. Wilson Observatory. When attached to a motion picture camera prominences have been photographed moving with velocities exceeding 180,000 miles per hour.

Prominences are visible to the naked eye only for a few minutes during a total eclipse of the sun. Otherwise they are visible only with expensive apparatus or simpler devices used at high altitudes. The new instrument, which makes use of polaroid and has no moving parts, can be used with a small telescope at any elevation.

Dr. Pettit stated that "with the new instrument scarlet flames stood out in the atmosphere of the sun with remarkable sharpness, resembling a prairie fire."

Science News Letter, June 28, 1941

Vitamin B_1 Fails

THE STORY of a vitamin experiment that backfired was told to plant pathologists attending the meeting, by Dr. Dean E. Pryor of the U. S. Department of Agriculture. He undertook to test a theory that if cantaloup vines were given does of vitamin B_1 they would acquire extra vigor and thus become resistant to the troublesome fungus disease known as powdery mildew. Under both greenhouse and field conditions, the vitamin seemed, if anything, to impart more vigor to the fungus than it did to the vines. From these preliminary results, he concluded, it would seem that the vitamin "offers little possibility for control of cantaloup powdery mildew."

More hope would seem to be found in breeding and selection of strains resistant to the disease, for in experiments which Dr. Pryor carried on jointly with Dr. Thomas E. Whitaker, also of the Department of Agriculture, a number of plants were found that showed no gross signs of the mildew, even in the midst of plantings that were heavily infested. Further search for resistant strains is still going on.

Science News Letter, June 28, 1941

Sea Level Not Level

SEA LEVEL isn't level in the equatorial region of the Pacific ocean. It is two feet higher on the Australasian side than it is on the American, Dr. H. U. Sverdrup, director of the Scripps Institution of Oceanography, declared in his address as president of the Pacific division of the American Association for the Advancement of Science.

As a result of this difference in elevation, there is a narrow, relatively swift current flowing eastward along the equator. If it were not for the friction of water against water, it would move at a rate of about seven knots, said Dr. Sverdrup. Its actual rate is one or two knots. This, however, is as rapid as the current in a great many inland rivers.

The pile-up of water against the Pacific's western shore results from the action of the trade winds, the speaker stated. Steady winds blowing across the water from the northeast in the northern hemisphere's lower latitudes, and corresponding winds from the southeast in the southern hemisphere, keep two great currents moving steadily westward in the tropical Pacific. Separating them, in the equatorial belt of calms, is the narrow return current, flowing like a river.

This narrow west-to-east equatorial current, however, accounts for only a small part of the water returned across the Pacific. Much larger streams flow away from the equator, to make the return trip at higher latitudes. In the northern hemisphere, the principal returning mass is borne in the Kuroshio or Japan current, which sweeps along the Aleutian chain and turns southward along the North American coast. It is estimated that this current carries more than 5,000 times as much water as the Mississippi.

As described by Dr. Sverdrup, the Pacific is a cold monster with a relatively thin, warm skin. Surface temperatures are quite high, reaching as much as 75 degrees Fahrenheit. But this warm surface layer extends downward only a few hundred feet at most. The great bulk of Pacific ocean water, in the depths, is always cold, most of it only a few degrees above freezing-point.

Science News Letter, June 28, 1941

RADIO

Airplane Locator Probably Uses Altimeter Principle

ADMISSION by Lord Beaverbrook and other British aviation officials that they have a secret radio device for locating enemy planes confirms suggestions that have been made in the United States for some time. Though the nature of the device is not revealed, it is probably some apparatus that uses, in reverse, principles of the radio altimeter.

The ordinary aneroid barometer, commonly used as an altimeter, measures altitude above sea level by showing air pressure, which decreases with height. However, especially when travelling over mountains, what is more important is the height of the plane above the ground. The radio altimeter sends out a high frequency radio wave, which is reflected from the ground. A receiver on the plane picks up this echo and the time, though a small fraction of a second, is measured. This gives the height.

In the British device, it is believed, the radio beam is sent out, the metal shell of the airplane reflects it, and the receiver detects it on the rebound. Details of one possible way of doing this were revealed last February by the U. S. Patent Office,

when patent number 2,231,929 was granted to Joseph Lyman for a radio airplane locater. 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.

Science News Letter, June 28, 1941

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.*)

Science News Letter, June 28, 1941

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.

Science News Letter, June 28, 1941

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.