

## PHYSICS

## Temperature in Engines Measured by Magnet Ratio

► A UNIQUE moving-magnet ratio instrument, designed for the measurement of oil and coolant temperatures in aircraft, was described by F. R. Sias and D. B. Fisk, both of the General Electric Company, at a meeting of the American Institute of Electrical Engineers in St. Louis.

The instrument consists of two sets of coils set at right angles to each other and a rotor moved by the coils. The small outer set of coils carries a constant current. The larger inner set of coils, perpendicular to the axis of the outer coils, is connected with the temperature bulb that records the oil or coolant temperature in the engine; the current varies directly with the temperature. The rotor aligns itself according to the ratio of the current between the two sets of coils. A pointer attached to the rotor indicates the temperature on a dial attached to the instrument panel of the airplane.

The development of new magnetic materials, all characterized by high magnetic energy per unit weight and high coercive force, shown to an exceptional degree in sintered oxide, makes possible the construction of moving coil instruments for aircraft. The new instrument has the properties of light weight, ruggedness, simplicity, and serviceability required for aircraft use.

The instrument is readily adaptable to the measurement of ohms, current ratios, voltage ratios as well as telemetering and voltage-weighted current indications.

*Science News Letter, August 26, 1944*

## CHEMISTRY

## Chemical Industry Medal Presented to Col. Dewey

► THE CHEMICAL Industry Medal, awarded annually by the American Section of the Society of Chemical Industry, is being presented this year to Col. Bradley Dewey for his work in colloid chemistry, especially pertaining to rubber latex, and his accomplishment in administering the synthetic rubber program during a critical war period.

Col. Dewey recently resigned as Rubber Director because he felt that the synthetic rubber construction program had been completed. In World War I, Col. Dewey was awarded the Distinguished Service Medal while in charge of the Gas Defense Division.

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**AIRBORNE LIFEBOAT**—Fastened under the wing of a Boeing B-17 with clearance a matter of inches, this boat can be dropped into the water from an altitude of 300 feet by means of a rayon parachute. Official U. S. Air Forces photograph.

## MILITARY SCIENCE

## Airborne Lifeboats

Survivors in the ocean can now be saved by all-plywood, power-driven lifeboats dropped from planes. Can use sails to save gasoline.

► LATEST DEVICE used for air-sea rescue work is an all-plywood, power-driven lifeboat dropped from planes to persons downed at sea. The boat carries enough food, clothing, and gasoline and sail to permit a voyage of 1,500 miles in rough weather on any ocean in the world. Twelve men off Cuba could, with reasonable luck, reach New York City in one of these boats.

The boat is dropped by 48-foot rayon parachutes from four types of planes, the B-17, B-29, C-46 and C-54, flying at an altitude of 800 feet into the wind at a speed of 120 miles an hour. It strikes the water at an impact speed of 25 feet per second, and at an angle of 45 degrees. Upon striking, a smoke-pot is set off to aid survivors in spotting the boat. Two rockets with 150-yard buoyant lines are also fired automatically from each side of the boat, by means of an electric salt-water immersion switch. Using these lines, the survivors are able to pull themselves to the boat, if the

sea is too rough for swimming to it.

To save gasoline, the 27-foot boat can be converted into a sailing sloop by use of a portable 20-foot mast and 145 square feet of mainsail and jib. Top speed of the boat, when operated by twin five-horsepower engines, is eight miles an hour. In addition to furnishing power, the engines are used to operate two saltwater stills, and their hot cylinder heads serve as stoves for heating canned food and coffee and for cooking fish and birds which survivors may catch.

The boat is divided into three sections: fore and aft chambers with an open cockpit in the middle. The chambers shelter the men from inclement weather and the blistering rays of the sun. To prevent the boat from capsizing in rough seas, cylinders filled with carbon dioxide are stowed fore and aft. The craft has weathered a 30-foot sea in tests.

Standard equipment includes blood

plasma and medical supplies, canned foods, fishing tackle, blankets, air mattresses, rain-repellent parkas and pants, underwear, fatigue hats, stockings, radio equipment, signalling and navigational devices, as well as cigarettes, and chewing gum.

The new rescue boat, popularly called "The Flying Dutchman," was developed by the Army Air Forces Materiel

Command last fall to provide navigable craft for floating survivors of ship sinkings or ditched planes, when rough seas prohibit seaplanes from landing, or when there are too many survivors to be picked up by aircraft; and for survivors stranded on isolated islands which are not accessible because of coral reefs and jungle.

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#### MEDICINE

## Sulfa for Gas Gangrene

**Sulfabenzamine has been found to be effective against germs prolific in the soil of France. May soon be prepared in tablet form.**

► A NEW SULFA drug effective against the kind of germs that cause gas gangrene in wounds has been developed and given extensive study, Dr. Theodore G. Klumpp, president of the Winthrop Chemical Company of New York, announces.

The new drug is sulfabenzamine. Winthrop calls it Sulfamylon. It is superior, Dr. Klumpp says, to other sulfa drugs in infections with anaerobic bacteria. These germs grow without air,

include the group that causes gas gangrene, and are especially prolific in the soil of France.

Two German preparations containing Sulfamylon, captured by the British in North Africa, spurred the interest of the Winthrop scientists in developing a better sulfa drug for anaerobic infections. The captured drugs were called Marfanil and Marfanil Prontalbin. They were in powder form for dusting on wounds.

Preparation of Sulfamylon in tablet

form to be taken by mouth, which may be more effective than its use as a powder dusted on wounds, may be expected soon, Dr. Klumpp believes.

A test for determining the concentration of the new drug in the blood of patients, necessary for determining proper dosages, has been developed. In this connection Dr. Klumpp states that laboratory experiments are already under way under the direction of the National Research Council and that tests on patients will follow.

Besides its effectiveness against anaerobic bacteria, sulfabenzamine, or Sulfamylon, has two other advantages over other sulfa drugs: Its antibacterial activity is not affected by pus or other wound discharges and is not neutralized by para aminobenzoic acid.

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#### PHYSIOLOGY

## Male Brain Becomes Female Through Chemical Change

► MALE brains can be changed to female and female brains to male ones by injections of appropriate sex hormones, Dr. Arthur Weil, of Northwestern University, reported at the meeting of the Association for the Study of Internal Secretions.

The brain sex reversal is a change in chemical constitution of the brain, specifically in its phospholipid content. Injection of a female sex hormone into a young male rat changes its brain chemical composition to the female type. Male sex hormone injection into the female accomplishes the reverse change.

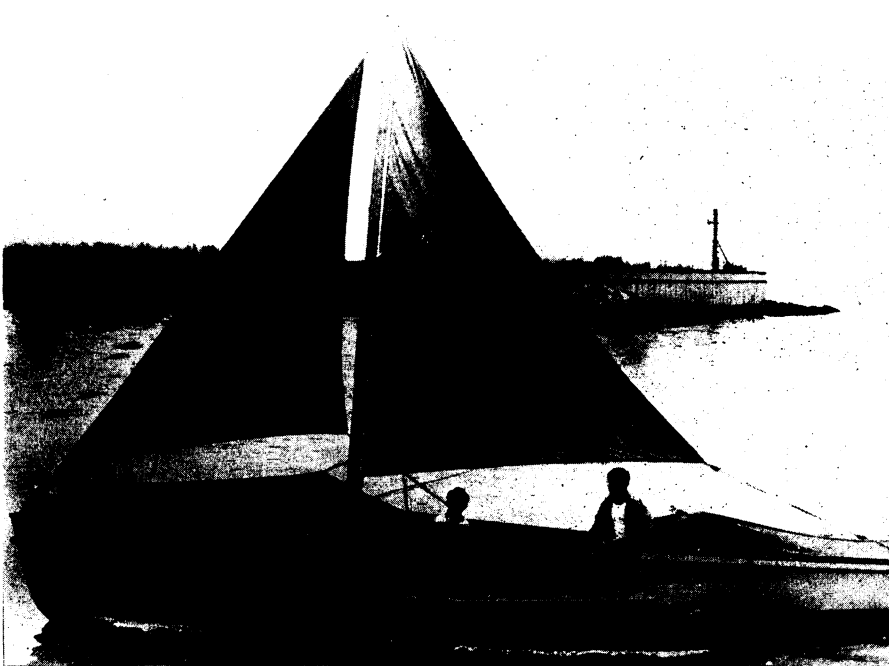
Removal of the sex glands changes the chemical constitution of the male and female brain to a more neutral intermediate level, Dr. Weil reported.

Hormones from other glands also affect the chemical composition of the brain. When the adrenal glands, which produce the familiar adrenalin as well as another powerful hormone, are removed, both male and female brains increase considerably in size. The amount of different lipid fractions increases proportionately, but without qualitative changes.

Removal of the pituitary gland in the head affects the male brain slightly more than the female brain, and leads to a slight increase in the amount of phospholipids and their phosphorus content.

Previous study has shown that the phospholipid content of the brain is not changed qualitatively by either excess or deficiency of thyroid gland hormone.

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**RESCUE**—The lifeboat, shown in this official U. S. Air Forces photograph, was dropped from a plane. Although it is a powerboat, sail can be used to conserve gasoline.