

• Books of the Week •

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THE AMPLIFICATION AND DISTRIBUTION OF SOUND—A. E. Greenlees—*Chapman and Hall (Sherwood)*, 2d ed., 302 p., illus., \$6.00. A book of British origin for engineers and owners of sound equipment.

ANIMALS WITHOUT BACKBONES: An Introduction to the Invertebrates—Ralph Buchsbaum—*University of Chicago Press*, rev. ed., 405 p., illus., \$6.50. In this revision of a most interesting text, 150 new photographs have been added to the gorgeous collection the book already contained, and a chapter has been added on advanced invertebrate zoology.

THE AVIAN EGG—Alexis L. Romanoff and Anastasia J. Romanoff—*Wiley*, 918 p., illus., \$14.00. An attempt to bring together in one volume all the known facts about birds' eggs. An exhaustive and scholarly work.

CAUSES OF INDUSTRIAL PEACE UNDER COLLECTIVE BARGAINING: Case Studies 4—Hickey-Freeman Company, Amalgamated Clothing Workers of America—Donald B. Straus—*National Planning Association*, 85 p., paper, \$1.00.

THE EFFECT OF CARBOHYDRATES ON EXPERIMENTAL CARIES IN THE RAT—Gerald J. Cox, Mary L. Dodds, Margaret Matuschak Levin and Harold C. Hodge—*Mellon Institute*, 16 p., illus., paper, free on request to publishers at University of Pittsburgh, Pittsburgh 13, Pa.

ELEMENTS OF ELECTROMAGNETIC WAVES—Lawrence A. Ware—*Pitman*, 203 p., \$3.50. A college text.

HELPING FAMILIES PLAN FOOD BUDGETS—Bureau of Human Nutrition and Home Economics—*Govt. Printing Office*, 16 p., paper, 15 cents. Prepared in response to requests by food economists for such a manual. Especially for nutrition leaders and teachers.

HISTORICAL GEOLOGY—Carl O. Dunbar—*Wiley*,

567 p., illus., \$5.00. A beautifully illustrated text on the history of the earth and the creatures that long ago lived on it.

AN INTRODUCTION TO COMPARATIVE BIOCHEMISTRY—Ernest Baldwin—*Cambridge (Macmillan)*, 164 p., illus., \$1.75. A small, readable book of British origin intended for college students and general readers "whose interest may be great but their leisure small."

THE LIFE STORY OF THE FISH: His Morals and Manners—Brian Curtis—*Harcourt, Brace*, rev. ed., 284 p., illus., \$3.75. Answering such questions as; Is a fish colorblind? Does he feel pain? How fast does a salmon swim? You will be interested whether you are angler, home aquarium keeper or science-minded layman.

THE STRUCTURE OF MATTER—Francis Owen Rice and Edward Teller—*Wiley*, 361 p., illus., \$5.00. Intended to indicate the scope of phenomena, from stars to atom nuclei, that can be explained by the help of quantum mechanics, and to do this with a minimum use of mathematics.

STUDY ABROAD, INTERNATIONAL HANDBOOK OF FELLOWSHIPS, SCHOLARSHIPS AND EDUCATIONAL EXCHANGE, VOLUME 1, 1948—United Nations Educational, Scientific and Cultural Organization—*Columbia University Press*, 224 p., paper, \$1.00. The first of a series of volumes providing details of all available opportunities to travel outside one's own country for study or research. This volume lists 10,500 opportunities for study in 27 countries.

SWEEPER IN THE SKY: The Life of Maria Mitchell, First Woman Astronomer in America—Helen Wright—*Macmillan*, 253 p., illus., \$4.00. In 1831, at the age of 12 years, Maria Mitchell was observing with her father an annular eclipse of the sun. She devoted her life to astronomy, education, and to improving the place of women in the scientific world.

Science News Letter, February 12, 1949

PHYSICS

Magnetic Fluid Clutch

► MAGNETIC OIL is the key to a new magnetic fluid clutch, the mechanism that connects the engine shaft with the shaft that drives the wheels of an auto. Such a clutch is suitable not only for automobiles, but for many other types of machinery.

The magnetic oil is made by mixing ordinary oil with iron dust, producing a special mixture containing millions of tiny particles of iron. The electric system magnetizes them as needed.

The electromagnetic fluid clutch, developed at the National Bureau of Standards, is relatively simple. In its basic form, it has only four elements—a driving shaft with a plate at its end, a driven shaft and plate, the iron-oil mixture between, and a coil to magnetize the mixture.

Current passed through wires, which may be wound inside the driving disk, es-

tablishes a magnetic field between the two parallel plates. The iron-oil particles, in the space between the plates, form chains which bind the two plates together. Described as extremely smooth in operation, the electromagnetic fluid clutch was invented by Jacob Rabinow, chief of the ordnance mechanics laboratory at the Bureau.

The electromagnetic fluid clutch is extremely smooth in action because all contacting surfaces, both the plates and the carbonyl iron powder, are coated by a lubricant. When the iron-oil mixture is unmagnetized, it permits the engine to turn independently of the wheels, as when the clutch in an ordinary car is released. When the electromagnet is turned on, iron and oil in the magnetic field seem to solidify to connect the moving parts just as a standard clutch does when it is engaged.

Some idea of how this clutch works may be secured in the home laboratory. A little iron powder, mineral oil, magnet wire, battery or other source of electricity, and a large wooden spool are all the equipment needed.

Such simple apparatus will enable you to pull up peaks of the magnetized fluid, which peaks continue to rise above the surface until the current is cut off. You can turn upside down a container full of the iron-oil mixture and little if any will run out; yet the liquid rushes out when the current is disconnected. A long nail, which turns freely in the unmagnetized liquid, can be used as a handle to turn a large spool of wire by putting the electromagnet into operation.

This shows the principle on which the electromagnetic fluid clutch operates. When the current is on, the engine shaft and the shaft that drives the wheels turn together as if one; when the current is off, one turns free of the other.

A tiny magnet and a vial containing carbonyl iron powder have been collected for you by Science Service. You can obtain these specimens, along with full instructions as to how to perform fundamental experiments in magnetism and how to show the principle upon which the electromagnetic fluid clutch is based. Just send 50 cents to Science Service, 1719 N St., N. W., Washington 6, D. C., and ask for the Magnetic Kit.

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PUBLIC HEALTH

U. S. Influenza Vaccine Can Fight Type in Europe

► THE U. S. anti-influenza vaccine will be effective against the type of influenza now present in European countries if it spreads across the Atlantic.

This is the opinion of Dr. Christopher H. Andrewes, head of the World Health Organization's World Influenza Center at Hampstead, England.

The virus causing 'flu in Europe now is the variant of Type A Influenza which appeared in 1947, Dr. Andrewes has found preliminarily. This type was added to U. S. commercial vaccines after its appearance.

Influenza has been epidemic in Holland, France and Italy. There has been a little in England. In Paris one out of every four persons has been stricken, according to best French estimates.

There is some question now whether the European 'flu outbreak will spread to the United States before the end of the normal influenza season there. So far, it has been spreading very slowly if at all across the Atlantic.

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Ramie, fiber used for cloth for centuries in Egypt, promises to become an important American product, being now grown in Florida and California; the plant produces the toughest of all vegetable fibers.