

written by experts in their respective fields of technology.

UNEMPLOYMENT AND THE AMERICAN ECONOMY—Arthur M. Ross, Ed.—Wiley, 216 p., \$4.95. Contains papers on retraining and labor market policies, problems of expanding economic activity, and on what the U.S. can learn from the European experience.

WILD FLOWERS to Know and to Grow—Jean Hersey—Van Nostrand, illus. in color by Allinora Rosse, \$6.95. Describes 200 native plants, tells how and where to grow them, and how to protect them.

WILLIAM HERSCHEL and the Construction of the Heavens—Michael A. Hoskin, astrophysical notes by D. W. Dewhirst—Norton, 199 p., illus., \$6. Biography of 18th century astronomer, and analysis of his contribution to sidereal science.

THE WONDERS OF FUNGI—Lucy Kavalier—Day, 128 p., illus. by Richard Ott, photographs, \$3.64. Tells boys and girls about molds, yeast and mushrooms, and their effects on man.

TAXATION—J. Woodrow Sayre and Edith Stull—Watts, F., 74 p., diagrams, \$2.50. Explains the theory and structure of taxation for young readers.

THE THREE CHRISTS OF YPSILANTI: A Psychological Study—Milton Rokeach—Knopf, 340 p., \$5.95. A psychologist's study of three mental hospital patients each of whom believes that he is Jesus Christ.

THE TWO BIOLOGIES—J. W. S. Pringle—Oxford Univ. Press, 28 p., paper, 60¢. Inaugural lecture on the biology of organic evolution and on the more recent molecular biology which has "come of age" with the knowledge of the double-helix structure of DNA.

USA AND ITS ECONOMIC FUTURE: A Twentieth Century Fund Survey—Arnold B. Barach—Macmillan, 148 p., graphics by Rudolph Modley, paper, \$1.95. Relevant facts presented in simply written style, reinforced by graphic illustrations, with annotated statistical appendix.

THE VICTORIA AND THE TRITON—Bern Dibern—Blaisdell Pub. Co., 110 p., illus., \$3.50; paper, \$1.95. Historical monograph, compares Magellan's navigational achievement with that of the nuclear submarine.

A VIEW OF ALL THE RUSSIAS—Laurens van der Post—Morrow, 374 p., folded map, \$5.95. An account of personal impressions of the physical scene of the Soviet Union and contacts with the Russian people while traveling east as far as Lake Baikal and Khabarovsk on the Amur.

WHO'S WHO IN INDIAN SCIENCE—H. Kothari, Ed.—Kothari Publications, 176 p., \$3. A reference book on leading Indian scientists, physicians and engineers, includes technical register and information on Indian scientific organizations.

WONDERS OF ANIMAL ARCHITECTURE—Sigmund A. Lavine—Dodd, 63 p., illus. by Margaret Cosgrove, \$3. Tells children about many kinds of animal habitations, from fox holes to the wasps' masonry.

WORLDS LOST AND FOUND: Discoveries in Biblical Archeology—Azriel Eisenberg and Dov Perets-Elkins—Abelard-Schuman, 208 p., illus. by Charles Pickard, \$3.75. Thirteen stories, ranging from the chance discovery of the Rosetta Stone to an account of modern underwater archaeological techniques.

• Science News Letter, 85:348 May 30, 1964

INVENTION

Patents of the Week

A spherical lens receives and focuses radar beams in a stationary position and can receive different frequencies from different directions at the same time.

► A NEW, LIGHTWEIGHT radar "eye" in the shape of a ball instead of a saucer receives and focuses microwave beams in the same way the human eye receives and focuses light.

The U.S. Patent Office issued patent 3,133,285 for this spherical lens, already being used as a radar "eye" in a few locations by the armed forces.

Radar, which stands for radio directing and ranging, "sees" for great distances by sending out radio signals. Those that strike an object such as a plane or boat are reflected back and picked up by the receiving antenna to pinpoint location of an object.

Instead of a huge, rotating saucer-shaped reflector that receives the reflected signals, the new spherical lens refracts or "bends" the rays as does a glass prism. The lens is constructed on the "Luneberg" principle which states that light beams entering the lens are focused on a central point, just as the eye focuses light.

The advantages of a Luneberg radar lens are that it can be stationary instead of rotating like conventional radar systems and can receive different frequencies from different directions at the same time.

Cooling System Problems

Two problems previously hindering the construction of Luneberg lenses are a cooling system inside the sphere and the material of which the lens is formed. In this invention, corrugated, pie-shaped wedges of simulated foamed plastic are interwoven in such a way that layers of air provide natural cooling.

In order to achieve the Luneberg effect

of focusing energy waves, the lens material must have a higher "dielectric constant" in the center of the sphere than near the surface. The dielectric constant is a number denoting the ability of a material to resist the flow of electric current through it.

A material with a high dielectric constant is a good insulator, while a material with a low dielectric constant is a good conductor. The patent describes three ways in which the pyramid-shaped wedges may be "woven" to produce the Luneberg effect.

The lens was developed by Thomas J. Jordan, Ballston Lake, N. Y., and Henry T. Plant, Rotterdam, N. Y., both engineers in the plastics processing group of General Electric Company's manufacturing services division in Schenectady, N. Y. Patent rights were assigned to General Electric.

Flash Protection Garment

A retired U.S. Air Force major has designed a garment to protect a person from the blinding flash accompanying a nuclear explosion. When not in use, it folds up in a package the size of a cigarette pack and can be carried in a person's pocket, handbag or auto glove compartment.

Maj. Donald R. Langdon, Mobile, Ala., was awarded patent 3,132,344 for his invention, which resembles a kingsize dry cleaning bag. It is quickly pulled on over the head in an emergency. There is no opening at the top.

The garment is made of aluminum foil on the outside and plastic or paper on the inside. The foil's reflective properties would minimize the effects of thermal radiation and flash burns, Maj. Langdon believes.

After the first shock wave of the explosion, the transparent plastic window near the person's face can be "opened" by peeling away an inside cover. Tie cords attached inside the bag can be tied around the wearer's waist and ankles, enabling him to move about.

Maj. Langdon assigned 50% of the patent rights to Oilver E. Gibson, Philadelphia, an Air Force equipment specialist temporarily assigned to the U.S. Navy. They have not yet licensed the patent for manufacture.

Porpoise-Shaped Vehicle

Patent 3,131,664 was issued for a porpoise-shaped sea taxi that moves at high speeds underwater and frolics like a porpoise on the surface. The fiberglass vehicle, complete with flippers, could rapidly carry a lone scuba diver to an underwater demolition project or to chart a mine field.

Marine photographers, underwater construction engineers, salvage divers and military frogmen could all depend on this bubble-top sea sled to carry them silently and quickly to a specific location without exhausting their oxygen supply.

Invented by George W. McInvale, Irving, Texas, formerly with Ling-Temco-Vought, Inc., Dallas, the sled would dive and ascend by filling the ballast tanks with water or blowing it out by compressed air. If the diver wanted to get out instead of ride around, the bubble-top would slide back.

The diver lies on his stomach on a contoured couch, to operate the sea sled by a control stick in the front. The sled can bank, turn, dive or ascend, following the swimming pattern of a porpoise if deception is necessary.

Electrical power is supplied by a hydrogen-oxygen fuel cell, and a special rubber-like synthetic "skin" described in the patent reduces the frictional drag on the machine as it moves through the water.

Patent rights were assigned to Ling-Temco-Vought, which has no immediate plans for developing the invention.

Other Significant Patents

An unsinkable paddle-wheeled boat for children propelled by foot pedals—patent 3,132,623 to Lawrence Conklin, Pittsburgh, Pa.

A liquid rocket fuel consisting of an alkali metal borohydride in hydrazine, held secret for almost 16 years—patent 3,132,977 to William P. Knight, Covina, Calif.; assigned to Aerojet-General Corporation, Azusa, Calif.

A cosmetic compact divided into eight pie-shaped compartments to hold different powders, cakes or creams—patents 3,132,652 and 3,132,653 to Eva Gazdik, Zephyr Cove, Nev.

An anti-snoring device that locks on to a person's upper jaw and depresses his tongue without preventing swallowing—patent 3,132,647 to Giuseppe Corniello, Los Angeles.

An auxiliary fuel system for automobiles—patent 3,132,685 to Malcom N. McKinnon, Salt Lake City, Utah.

• Science News Letter, 85:348 May 30, 1964