

METEOROLOGY—Committee on Atmospheric Sciences—*Nat. Acad. of Sciences-Nat. Res. Council*, 13 p., paper, single copies free upon request direct to publisher, Washington 25, D. C. Summary of training and research in the meteorological sciences in U. S. universities.

THE STORY OF CHEMISTRY—Georg Lockemann—*Philosophical Lib.*, 277 p., \$4.75. German chemist reviews the history of chemistry from antiquity to the twentieth century.

TEACHING SCIENCE THROUGH CONSERVATION—Martha E. Munzer and Paul F. Brandwein—*McGraw*, 470 p., illus., \$7.50. Practical laboratory and field study procedures for the study of conservation taught through general science, biology, chemistry and physics.

TECHNICAL ASPECTS OF DETECTION AND INSPECTION CONTROLS OF A NUCLEAR WEAPONS TEST BAN: Summary Analysis of Hearings, April, 1960—Joint Committee on Atomic Energy—*GPO*, 78 p., illus., paper, 30¢. Unanimously approved by all members of Special Subcommittee on Radiation and Subcommittee on Research and Development.

THEORY OF WING SECTIONS: Including a Summary of Airfoil Data—Ira H. Abbott and Albert E. von Doenhoff—*Dover*, rev. ed., 693 p., illus., paper, \$2.95. Corrected version of reference work first published in 1950.

THREE COPERNICAN TREATISES: The Commentariolus of Copernicus, The Letter against Werner, The Narratio Prima of Rheticus—transl. & introd. by Edward Rosen—*Dover*, 2nd rev. ed., 283 p., paper, \$1.75. With an annotated Copernicus bibliography, 1939-1958.

A TREATISE ON GYROSTATICS AND ROTATIONAL MOTION: Theory and Applications—Andrew Gray—*Dover*, 530 p., illus., paper, \$2.75. Unabridged reprint of work first published in 1918.

THE UNIVERSE OF LIGHT—Sir William Bragg—*Dover*, 283 p., illus., paper, \$1.85. Reprint of expanded, famous Royal Institute Christmas Lectures, for the general reader.

A VARIABLE ATMOSPHERIC-DENSITY MODEL FROM SATELLITE ACCELERATIONS—Luigi G. Jacchia—*Smithsonian Astrophysical Observatory*, Special Report No. 39, 15 p., paper, single copies free upon request direct to publisher, Cambridge 38, Mass.

Science News Letter, June 4, 1960

ORNITHOLOGY

Southern Birds Reported Flying Farther North

BIRDS ARE GOING farther north than they did a few years ago, according to Prof. Joseph Hickey of the University of Wisconsin wildlife management department.

Prof. Hickey said a northward trend in the ranges of birds has been noted in the United States. A number of formerly southern species now pushing into northern states.

He said a similar northward trend has been reported in Europe, and bird species from the southern parts of Europe have even been invading Scandinavia, Greenland and Iceland.

In the United States the blue wing warbler, tufted titmouse, cardinal, mockingbird and the turkey vulture are among the species moving north, Prof. Hickey said.

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METALLURGY

Furnace Melts Materials

AN INDUSTRIAL furnace has been developed that produces "exceptionally pure" ingots of space-age materials by bombarding these hard-to-melt materials with a high-powered electron beam.

It tackles with equal vigor the melting, alloying, and refining of such hard-to-handle materials as tantalum, molybdenum, columbium, tungsten, thorium, cobalt, nickel and hafnium. Some of these materials are so active chemically that it is difficult to obtain them in a pure state. Others have extraordinarily high heat resistance and stubbornly resist melting.

The furnace will produce ingots of up to 50 pounds for tantalum, and of proportionate weights for the other materials. The biggest ingot the furnace will make measures four inches in diameter and 14 inches long.

Developed by the NRC Equipment Corporation, subsidiary of the National Research Corporation, Newton, Mass., the new furnace works in principle like a TV picture tube. A high-powered electron gun blasts a target melt area. The electron beam is focused by a magnetic focusing coil. Unlike the TV tube, the electron beam bombards a single spot instead of sweeping the melt area. But just as the TV screen has a high voltage applied, so a 20,000-volt attracting force is applied to the stock to be melted. The electron beam attacks this stock with a power of 60,000 watts.

Many engineering problems had to be solved in the development of this workhorse furnace. The high voltages used could cause bad electrical flashes inside that could wreck the electron gun. Also, high voltages

on the stock to be melted could cause X-rays to be produced during a melt. This would necessitate protective shielding around the whole furnace if such was to be a standard operating condition. Further, sudden gases belched from the melting metal could attack and harm the electron gun.

But the new vacuum furnace is said to overcome these problems to such an extent that it can be operated by skilled labor.

Science News Letter, June 4, 1960

CONSERVATION

Tree's Value Doubles Between 60 and 70 Years

THE NUMBER of board feet in a Wisconsin hardwood tree nearly doubles between the ages of 60 and 70 years, statistics compiled by the Wisconsin Conservation Department show. The department said that the average hardwood tree has reached a 12-inch diameter in 60 years, and would then produce about 57 board feet of lumber. But at the end of another 10 years, the same tree would produce 110 board feet. When it reaches the age of 100 it will yield nearly 300 board feet. In addition, the lumber from the older trees will bring a premium price because of its higher quality, the department said.

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