



**COUNTS MONEY**—Worn-out paper money is put through this machine where an electric eye counts the bills. It can handle 30,000 bills per hour and rejects packages containing more or less than the correct number, 100.

#### ELECTRONICS

### Machine Counts Worn Paper Currency

► YOUR beat-up, worn-out old bills, which must be counted before they can be retired and destroyed, will soon make their last as well as their first bow to a machine.

The National Bureau of Standards has just demonstrated an automatic, electronic machine for counting old paper money. New currency has been machine-counted for many years, but handling wrinkled, dog-eared notes was a difficult problem, calling for hand counting. Over eight tons of currency are redeemed every day, about

80% consisting of one-dollar bills.

Money returned to the Treasury for retirement is in the form of stacks of 100 notes, cut in half lengthwise. The machine, designed by H. M. Joseph and Carroll Stansbury of the Bureau, counts the half-notes in these packets at the rate of 30,000 bills per hour and rejects those with more or less than 100. From an inclined trough, a metal finger pulls the bottom packet, then wraps it tightly around a spindle, spreading the outer edges of the notes against

a curved metal plate. The spindle rotates the ends of the notes while a jet of air separates the notes from the packet.

A photoelectric eye catches the interruption of a light beam as the notes are unfurled. An electronic unit adds up the individual impulses, using the sum to actuate a sorting vane. Only those packets rejected by the machine, known as the NBS Electronic Currency Counter, need be counted laboriously by hand.

Science News Letter, February 3, 1951

## Books of the Week

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWSLETTER, 1719 N St., N. W., Washington 6, D. C. Ask for free publication direct from issuing organizations.

**ADVANCES IN CARBOHYDRATE CHEMISTRY, Vol. 5**—Claude S. Hudson and Sidney M. Cantor, Eds.—*Academic Press*, 322 p., illus., \$6.80. Volume 5 of this series presents such topics as Enzymatic Synthesis of Sucrose and Other Disaccharides, Enzymes Acting on Pectic Substances, and The Commercial Production of Crystalline Dextrose.

**ATLAS OF HISTOLOGIC DIAGNOSIS IN SURGICAL PATHOLOGY**—Karl T. Neubuerger—*Williams and Wilkins*, 460 p., illus., \$11.00. The essential histologic lesions are presented by means of black and white photomicrographs. A section on exfoliative cytology by Walter T. Wikle is included.

**THE ATOM AT WORK**—Jacob Sacks—*Ronald*, 327 p., illus., \$4.00. A brief history of atomic energy and its applications. For the layman.

**DRAGONS IN AMBER: Further Adventures of a Romantic Naturalist**—Willy Ley—*Viking Press*, 328 p., illus., \$3.75. The author conducts the reader on a tour of strange fauna and flora. About one third of the book deals with animals and plants which suddenly made themselves at home in countries where they did not belong, such as the Japanese beetle. Other portions of the book tell the history of amber and the romantic tale of the woolly mammoth.

**EARLY EMBRYOLOGY OF THE CHICK**—Bradley M. Patten—*Blakiston*, 4th ed., 244 p., illus., \$3.50. A standard embryology text brought up-to-date.

**FLORA OF PERU**—J. Francis MacBride—*Field Museum of Natural History*, Publ. 653, 218 p., paper, \$1.75. A taxonomic listing of the vegetation of this country.

**THE FROG: Its Reproduction and Development**—Roberts Rugh—*Blakiston*, 336 p., illus., \$4.25. A description of the embryology of the frog. An excellent glossary of embryological terms is included.

**IMPROVED NAILS FOR BUILDING CONSTRUCTION**—E. George Stern—*Virginia Polytechnic Institute*, 23 p., illus., paper, 25 cents. A comparison of grooved nails with plain-shank and other type nails.

**INGENIOUS MECHANISM FOR DESIGNERS AND INVENTORS, Vol. III**—Holbrook L. Horton, Ed.—*Industrial Press*, 536 p., illus., \$6.00. A reference book.

**AN INTRODUCTION TO THE SCIENCE OF PHOTOGRAPHY**—Katherine Chamberlain—*Macmillan*, 292 p., illus., \$4.75. The physics of photography is stressed in this book written primarily for those studying photography without an instructor.

**KOREA: An Annotated Bibliography of Publications in Far Eastern Languages**—Edwin G. Beal, Jr. and Robin L. Winkler, Compilers—*Library of Congress*, 167 p., paper, \$1.15. Essentially an expansion of the book, *KOREA: A Preliminary Bibliography* which was issued in July, 1950.

**KOREA: An Annotated Bibliography of Publications in the Russian Language**—Albert Parry, John T. Dorosh and Elizabeth Gardner Dorosh, Compilers—*Library of Congress*, 84 p., paper, 65 cents. Covers books, monographs and periodical articles.

**LABORATORY MANUAL FOR BRIEF COLLEGE CHEMISTRY**—Leon B. Richardson and Andrew J. Scarlett—*Holt*, rev. ed., 229 p., illus., paper, \$2.00. To accompany the authors' text, *Brief College Chemistry*.

**THE LA PORTE METEORITE**—Sharat Kumar Roy and Robert Kriss Wyant—*Field Museum of Natural History*, 9 p., illus., paper, 25 cents. A brief history and geological analysis.

**LEATHERCRAFT: Techniques and Designs**—John W. Dean—*McKnight*, 251 p., illus., \$5.00. Techniques of the master craftsmen.

**METHODS AND MATERIALS FOR TEACHING GENERAL AND PHYSICAL SCIENCE**—John S. Richardson and G. P. Cahoon—*McGraw-Hill*, 485 p., illus., \$4.50. Many practical suggestions for developing laboratory skills. For elementary and high school science teachers.

**MOTION AND TIME STUDY: Principles and Practice**—Marvin E. Mundel—*Prentice-Hall*, 457 p., illus., \$6.65. A college text. Many problems are included for practice.

**NATURAL CHILDBIRTH: A Manual for Expectant Mothers**—Frederick W. Goodrich, Jr.—*Prentice-Hall*, 176 p., \$2.95. A handbook containing many helpful hints for mothers-to-be.

**THE ORIGINS OF MODERN SCIENCE 1300-1800**—H. Butterfield—*Macmillan*, 187 p., \$3.00. A brief history of modern science showing the effects of happenings from 1300 to 1800.

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## ● RADIO

Saturday, February 10, 1951, 3:15-3:30 p.m., EST

"Adventures in Science" with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Rome A. Betts, executive director, and Dr. John W. Ferree, director of public health, American Heart Association, will discuss "Heart Disease, America's No. 1 Health Problem."

**PLANT EMBRYOLOGY:** Embryogeny of the Spermatophyta—Donald Alexander Johansen—*Chronica Botanica*, 305 p., illus., paper, \$6.00. Dealing with the gymnosperms and the angiosperms.

**PRACTICAL PHOTOGRAPHY**—Robert A. McCoy—*McKnight*, 221 p., illus., \$4.00. A guide for the amateur.

**PSYCHOLOGICAL BOOK PREVIEWS**, Vol. I, No. 1—John W. French, Ed.—*Psychological Book Previews*, quarterly, 188 p., paper, \$4.50 per year, \$1.25 per issue. Authors write descriptive summaries of their new books in the field of psychology. A bibliography of psychological book reviews appearing in American and British journals is included.

**PUBLIC OPINION 1935-1946**—Hadley Cantril, Ed.—*Princeton University Press*, 1191 p., \$25.00. Presents public opinion polls made by 23 organizations in 16 countries from 1935 to 1946 and includes such subjects as the atom bomb, international cooperation, and many aspects of World War II. It was prepared by Mildred Strunk.

**RADIATION MONITORING IN ATOMIC DEFENSE**—Dwight E. Gray and John H. Martens—*Van Nostrand*, 122 p., illus., \$2.00. How to use standard radiation detectors and interpret the results. It considers some of the protective measures against atomic explosions. For civil defense workers and others.

**REST AND PAIN**—John Hilton—*Lippincott*, 6th ed., 503 p., illus., \$10.00. A new edition of a classic source book in surgery. Edited by E. W. Walls, Elliot E. Philipp and H. J. B. Atkins, this is a specially bound limited edition.

**THE SMUT FUNGI: A Guide to the Literature, with Bibliography**—George William Fischer—*Ronald*, 387 p., \$6.00. A guide to the literature on the biology and control of some 330 species of smut fungi and the diseases they cause. Includes an excellent bibliography.

## BASIC HUMAN ENGINEERING HANDBOOK

A first book on the fundamentals of scientific human relations, in condensed, practical form. Immediately useful for teachers, physicians, scientists, industrialists, business men, husbands and wives, and others seeking scientific methods of better intercommunication, understanding and teamwork. Many diagrams and illustrations.

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**TV MASTER ANTENNA SYSTEMS:** Installation and Distribution—Ira Kamen and Richard H. Dorf—*Rider*, 356 p., illus., \$5.00. A working manual dealing with installation, maintenance, usage, manufacture and merchandising TV master antenna systems.

**VITAMINS AND HORMONES:** Advances in Research and Applications, Vol. VIII—Robert S. Harris and Kenneth V. Thimann, Eds.—*Academic Press*, 342 p., illus., \$6.80. This volume of this series includes such topics as The Physi-

ology of Relaxin by Hisaw and Zarrows, Interactions Between Estrogens and Progesterone by Courrier and Steroid Configuration by Shoppee.

**WET VENTING OF PLUMBING FIXTURES**—John L. French, Herbert N. Eaton and Robert S. Wyly—*Gov't. Printing Office*, National Bureau of Standards report BMS 119, 27 p., illus., paper, 20 cents. Results of laboratory tests are given.

Science News Letter, February 3, 1951

## POULTRY HUSBANDRY

# Middle-Sized Eggs Needed

Major problem of poultrymen is to breed hens that will not give eggs of extreme size. Egg weight is highly heritable.

➤ UNLIKE many industries that strive to produce the most, the biggest, the tallest, or the smallest of their respective products, a goal of America's poultry industry is to produce an intermediate-sized egg.

This is the most profitable egg size, Dr. I. M. Lerner, associate professor of poultry husbandry in the University of California's College of Agriculture, found in a survey. Breeding hens which produce these intermediate eggs is a major problem to poultrymen.

Extreme egg sizes are undesirable. Eggs can be too small to be of much economic value and they can be too large to bring maximum net returns. The goal of a poultry breeder, therefore, is a bird which produces eggs of intermediate weights—averaging 24 to 26 ounces per dozen.

If a breeder starts with a flock of chickens characterized by too small eggs, he selects breeding stock which will produce larger sizes. After several generations he may find that he has overshot his mark, the result being that too many birds are laying jumbo-sized eggs.

In that event he is forced to reverse his selection standards to attain the desired optimum or intermediate size.

"The egg weight responds to selective breeding more rapidly than any other economic character of poultry," Dr. Lerner found.

*Columbium* is an important metal used in steel alloys to improve ability to withstand high temperatures.

*Ammonia* fumes are often prevalent in poorly ventilated poultry houses during the winter months and they are likely to cause eye lesions in chickens.

Many *ceramic* materials can withstand higher temperatures than metals, but ceramics are brittle and consequently their use has been very limited in engineering applications.

This high heritability of egg weight permits the breeder to use the principle of "disassortive" mating, or mating of unlike birds. Thus, he may consistently mate large-egg laying females to sires from small-egg families and females laying small eggs to sires from large-egg families instead of taking the risk of having to change direction of selection over a period of years.

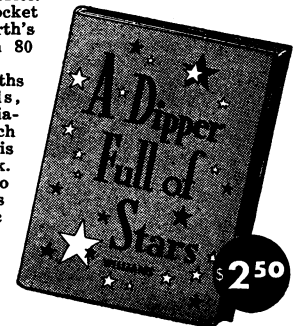
Science News Letter, February 3, 1951

## NEW ★ ENLARGED ★ ★ REVISED ★ "A Dipper Full of Stars"

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