

Next spring Bell will install in its Pittsburgh telephone office a kind of transistor thinking machine which will "remember" all possible routes a message can take from that city to any point in the country. When a call is blocked on one route by busy lines or local trouble, the robot will detour the call to its goal, mapping the route and giving orders in about a third of a second. Bell has tried to use tubes for this purpose, but they take too much space, power and maintenance. In Englewood, N. J., transistors were installed last fall as a part of the equipment which enables telephone subscribers to dial numbers directly in distant cities. This direct long-distance telephone service will gradually be installed in most large centers.

Most transistors are now earmarked for national defense, and production bottlenecks must be broken before they can be made in the great quantities needed to fill civilian demands. The metal must first be super-refined to a fantastic degree of purity—more than one part of foreign matter to 100,000,000 parts of germanium makes it unfit for use. "Doping" it with controlled impurities is equally fussy business. Workers who assemble transistors peer through microscopes and use delicate electronic "feelers" to guide them when vision is useless. But the best brains in American industry, backed by unlimited funds, say that mass production problems can be licked.

The first transistor was announced in

1948, and since then scientists and engineers have been improving it. The industry has already spent \$10,000,000 on development, and 37 foreign and domestic corporations, among them industrial giants, like IBM, IT&T, General Electric, Westinghouse and Raytheon, licensed to manufacture the mighty midget, are strongly competing to put it in harness.

No one can state with certainty when transistor radios and television sets will be on the market, but some engineers pick 1956.

Great numbers of electronic tubes, now manufactured at the rate of half a billion a year, will still be needed for jobs the germanium spider cannot do—in shortwave therapy, radio nailing and welding, where heat is needed, for TV picture tubes. And the transistor will expand the horizons of communications and industry to create new demands for tubes.

In less than half a century the electronic tube has changed the world, and the effect

of the transistor on all our lives may be equally potent.

This article was prepared for SCIENCE NEWS LETTER in cooperation with the Reader's Digest. It will appear shortly in that magazine.

Science News Letter, March 14, 1953

INVENTION

Design Diving Bell for Underwater Prospecting

► GEOPHYSICISTS PROSPECTING for oil beneath the surface of the Pacific and Gulf will have to go underwater if an invention patented by Clemille F. Sellers, El Banco, Colombia, South America, comes into general use. He has invented a diving bell which can carry a geophysicist and his prospecting instruments down to the bottom for use. Patent number is 2,627,727 and it is assigned to Robert H. Ray, Inc., of Texas.

Science News Letter, March 14, 1953

• Books of the Week •

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ALLAN AND TRISHA VISIT SCIENCE PARK—Caroline Harrison and Bradford Washburn — *Little, Brown*, 59 p., illus., \$2.00. In this book for children, a small boy and girl with their mother visit the Museum of Science and learn a great deal from the exhibits which they could work themselves.

ANIMAL MICROLOGY: Practical Exercises in Zoological Micro-technique—Michael F. Guyer—*University of Chicago Press*, 4th rev. ed., 331 p., illus., \$4.75. This classic text for beginners in animal microscopy has again been revised to include recent advances in technique.

ANTHROPOLOGY TODAY: An Encyclopedic Inventory—A. L. Kroeber, Chairman—*University of Chicago Press*, 966 p., \$9.00. Fifty papers by the world's leading anthropologists constituting a summary of the knowledge obtained to date in all phases of anthropology.

ARCTIC SOLITUDES—Admiral Lord Mountevans — *Philosophical Library*, 143 p., illus., \$4.50. The author, himself a well-known Arctic explorer who has been taking part in expeditions since the beginning of the century, tells here the story of trips that have been made to the top of the world. Excellent photographic illustrations.

ASTRONOMY FOR EVERYMAN—Martin Davidson, Ed.—*Dutton*, 494 p., illus., \$5.00. A popular presentation of all phases of astronomy, including instrumental equipment, aims and methods of the astronomer, a study of the heavens and a brief history. Excludes, for the most part, mathematics.

THE ATOM STORY: Being the Story of the Atom and the Human Race—J. G. Feinberg—*Philosophical Library*, 243 p., illus., \$4.75. The history of atomic development is traced from Democritus of 500 B.C. to the day of the hydrogen bomb.

BUILDING AMERICA'S HEALTH: Volume 4, Financing A Health Program for America—President's Commission on the Health Needs of the Nation—*Government Printing Office*, 363 p., paper, \$1.50. Presents some of the basic facts on health expenditures. Includes statements by the members of the Commission's Panel on Financing a Health Program.

The SOVIET IMPACT on SOCIETY

by Dagobert D. Runes

Preface by Harry Elmer Barnes

In what manner has Kremlin-controlled Sovietism raised or lowered human standards? Is man in Soviet society master of his own fate? May he follow unhampered his self-chosen vocation and avocation? Can he express his ideas and feelings as he wishes? Can he join his neighbors in groups, unions and confederations? Are his social or cultural activities dictated by political potentates?

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CARL LINNAEUS—Knut Hagberg, translated by Alan Blair—*Dutton*, 264 p., illus., \$4.50. A biography of the great Swedish botanist, writer and philosopher who endeavored to relate his botanical system to a comprehensive view of the design and coherence of Creation.

CARNEGIE INSTITUTION OF WASHINGTON, YEAR BOOK No. 51—*Carnegie Institution of Washington*, 286 p., paper, \$1.00. This 1951-1952 annual report includes resumés of the activities of the departments of astronomy, terrestrial sciences, biological sciences, archaeology and of the research associates connected with the Carnegie Institution.

CHEMISTRY: A Course for High Schools—John C. Hogg, Otis E. Alley, and Charles L. Bickel—*Van Nostrand*, 3rd ed., 772 p., illus., \$3.96. This revised edition has expanded sections on atomic structure, radioactivity, uranium, titanium and zirconium.

CHILD DEVELOPMENT: The Process of Growing Up in Society—William E. Martin and Celia Burns Stendler—*Harcourt, Brace*, 519 p., illus., \$6.50. Tracing for parents, teachers and physicians the day-by-day growth of children—physically, mentally, and socially.

CHILDREN IN PLAY THERAPY: A Key to Understanding Normal and Disturbed Emotions—Clark E. Moustakas—*McGraw-Hill*, 218 p., illus., \$4.50. Shows how normal children, or children with temporary or deep emotional problems, express their feelings through such objects as clay, paint, sand and dolls.

COLOR IN THE GARDEN—Norman Taylor—*Van Nostrand*, 118 p., illus., \$2.00. Enables the gardener to plan and produce a garden utilizing the predominant color of his choice, and to have continuous bloom in that color throughout the growing season.

ELECTRONICS MEASUREMENTS — Frederick E. Terman and Joseph M. Pettit—*McGraw-Hill*,

2nd ed., 707 p., illus., \$10.00. Both a college text and a reference work for the practicing engineer, this covers measurement fundamentals in radio, television, radar and other pulsed systems, and microwaves.

FERROELECTRICITY—E. T. Jaynes—*Princeton*, 137 p., paper, \$2.00. A general introduction to, and a guide to the literature published on, the subject of ferroelectricity.

FLATLAND: A Romance of Many Dimensions—Edwin A. Abbott—*Dover*, 6th ed., 103 p., illus., paper, \$1.00, cloth, \$2.25. Bringing back into print this delightful fantasy mainly concerned with "life" in a two-dimensional world written some 70 years ago by an imaginative man.

FOOD FOR YOUR HEART: A Manual for Patient and Physician—Department of Nutrition, Harvard School of Public Health, Harvard University—*American Heart Association*, 48 p., paper, 25 cents. Describes the relation of nutrition to heart disease and gives the sodium content of foods and water supplies. With suggested diets and menus.

GETTING THE MOST OUT OF A POWERBOAT—Lauren and Madge Clark—*Norton*, 256 p., illus., \$3.95. Covers all phases of owning, maintaining and cruising in powerboats.

HISTORIC RESEARCHES: Chapters in the History of Physical and Chemical Discovery—T. W. Chalmers—*Scribner*, 288 p., illus., \$5.00. Intended as a background for modern physics and chemistry, this work tells of the origins of such things as friction, X-rays, chemical elements and atoms, etc.

THE HUMAN SENSES—Frank A. Geldard—*Wiley*, 365 p., illus., \$5.00. Each of the sense channels is treated from the standpoint of physics of stimuli, and anatomy and physiology of the sense organ, before discussing the phenomena of the sense itself.

MANUAL OF THE NORTH AMERICAN SMUT FUNGI—George W. Fischer—*Ronald*, 343 p., illus., \$8.75. Enables the plant pathologist, agronomist or mycologist to identify recognized and classified smut fungi of this continent.

MICROMETEOROLOGY: A Study of Physical Processes in the Lowest Layers of the Earth's Atmosphere—O. G. Sutton—*McGraw-Hill*, 333 p., illus., \$8.50. Provides training in the specialized techniques that have evolved to solve problems in agricultural meteorology, hydrology, air pollution, etc.

MIGRATORY WORKERS: The Mobile Tenth of American Agriculture—Lowry Nelson—*National Planning Association*, 33 p., paper, 50 cents. Proposes private and voluntary measures, supplemented by legislation, to relieve the acute social and economic problems of these people.

MUSICAL ENGINEERING: An Engineering Treatment of the Interrelated Subjects of Music, Musical Instruments, Speech, Acoustics, Sound Reproduction, and Hearing—Harry F. Olson—*McGraw-Hill*, 369 p., illus., \$6.50. Aids the study, measurement and analysis of audio problems, including those of the recording, transmission and broadcasting of music.

ONE HUNDRED YEARS OF ENGINEERING PROGRESS WITH WOOD—*Timber Engineering Company*, 109 p., illus., paper, free upon request direct to publisher, 1319 Eighteenth St., N. W.,

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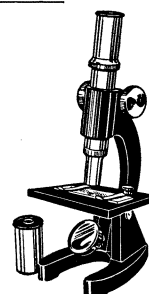
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Washington 6, D. C. Compilation of outstanding papers presented at the wood symposium held during the Centennial of Engineering Convocation in Chicago, Sept. 3-13, 1952.

O RUGGED LAND OF GOLD—Martha Martin—*Macmillan*, 223 p., \$3.00. The story of a woman pioneer as she lived alone and had her baby in the desolate cold of Alaska.

THE PERMANENT GARDEN—Norman Taylor—*Van Nostrand*, 128 p., illus., \$2.00. How to have a year round garden using only trees, shrubs and vines that require a minimum of maintenance expense and care.

PHANTASY IN CHILDHOOD—Audrey Davidson and Judith Fay—*Philosophical Library*, 185 p., \$4.75. By watching little children in their daily activity and play and by listening to their questions, it has been possible to show that much of the phantasy noted by Freud dates from very early childhood.

PREVIEW FOR TOMORROW: The Unfinished Business of Science—Bruce Bliven—*Knopf*, 348 p., illus., \$5.00. Many problems of today, including population questions, nutrition, conservation, medicine, engineering, psychology and psychiatry, can be remedied by science. This tells what science is doing and can do to solve them.

PROGRESS IN THE CHEMISTRY OF FATS AND OTHER LIPIDS: Volume I—R. T. Holman, W. O. Lundberg, and T. Malkin, Eds.—*Academic Press*, 186 p., illus., \$7.00. The first of an annual series. Of interest to the specialist in this field, the chemist, the biochemist and the medical scientist.

THE PROPERTIES OF ELECTRICAL INSULATING MATERIALS AND METHODS OF TEST—National Physical Laboratory—*Her Majesty's Stationery Office*, 16 p., illus., paper, 40 cents. As new materials are developed and proposed for use as insulators, they must be tested.

THE RADIO AMATEUR'S HANDBOOK—Headquarters Staff—*American Radio Relay League*, 30th ed., 548 p., illus., paper, \$3.00. Indispensable for the "ham," and useful for anyone having to do with radio.

SELECTED PETROGENIC RELATIONSHIPS OF PLAGIOCLASE—R. C. Emmons, Ed.—*Geological Society of America*, 142 p., illus., \$2.00. Material for this study was selected insofar as possible from normal plutonic and volcanic rocks.

SHIPS AT WORK—Mary Elting—*Garden City Books*, 93 p., illus., \$1.50. Introducing children to the sea and things nautical.

SOLAR EPHEMERIS AND POLARIS TABLES 1953—Herman J. Shea, Ed.—*C. L. Berger*, 123 p., illus., paper, 50 cents. Data for land surveyors.

SOME THINGS YOU SHOULD KNOW ABOUT MENTAL AND EMOTIONAL ILLNESS—*National Association for Mental Health*, 3 p., illus., paper, free upon request direct to publisher, 1790 Broadway, New York 19, N. Y. Here are some of the important facts about mental illness, what it is and how it can be distinguished from emotional illness or neurosis.

STATISTICAL ASTRONOMY—Robert J. Trumpler and Harold F. Weaver—*University of California Press*, 644 p., illus., \$7.50. Introduces the graduate student to the principal statistical problems in astronomy, to their mathematical formulation, and to methods and techniques of their solution.

THEORY OF BEAUTY: An Introduction to Aesthetics—H. Osborne—*Philosophical Library*, 220 p., \$4.75. The author, a graduate of Cambridge University, England, attempts here to lay the basis for a better understanding of that which is beautiful.

THIRTY-EIGHTH ANNUAL REPORT OF THE NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS, 1952—*Government Printing Office*, 69 p., illus., paper, 55 cents. This administrative report, without the technical reports, points out that NACA research is decreasing while the need for it is increasing.

TORNADOES OF THE UNITED STATES—Snowden D. Flora—*University of Oklahoma Press*, 194 p., illus., \$3.50. Provides a way to learn about the frequency and damage of these violent and spectacular storms, their causes, methods of forecasting and means of protection.

TRAINS AT WORK—Mary Elting—*Garden City Books*, 93 p., illus., \$1.50. Just the thing to let little Johnny take along on that train ride.

TREE AND SHRUB SPECIES FOR THE NORTHERN GREAT PLAINS—Ernest J. George—*Govt. Printing Office*, USDA Circular No. 912, 46 p., illus., paper, 20 cents. Trees and shrubs give needed protection against cold winds and drifting snow. They also attract beneficial birds. This report gives results of tests for suitability to the climate.

TRUCKS AT WORK—Mary Elting—*Garden City Books*, 93 p., illus., \$1.50. A book for children about trucks and highway transportation.

TUNGSTEN: Its Metallurgy, Properties and Applications—Colin J. Smithells—*Chemical Publishing Co.*, 326 p., illus., \$8.50. A book for metallurgists and students.

ULCERS AND STOMACH TROUBLES: Their Causes and Relief—Sidney A. Portis—*Hanover House*, 128 p., illus., \$2.00. For the person who is willing to face facts and wants to work successfully with his own doctor to achieve an eventual, and more rapid, cure.

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Questions

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