

15¢

\$5.50 A YEAR

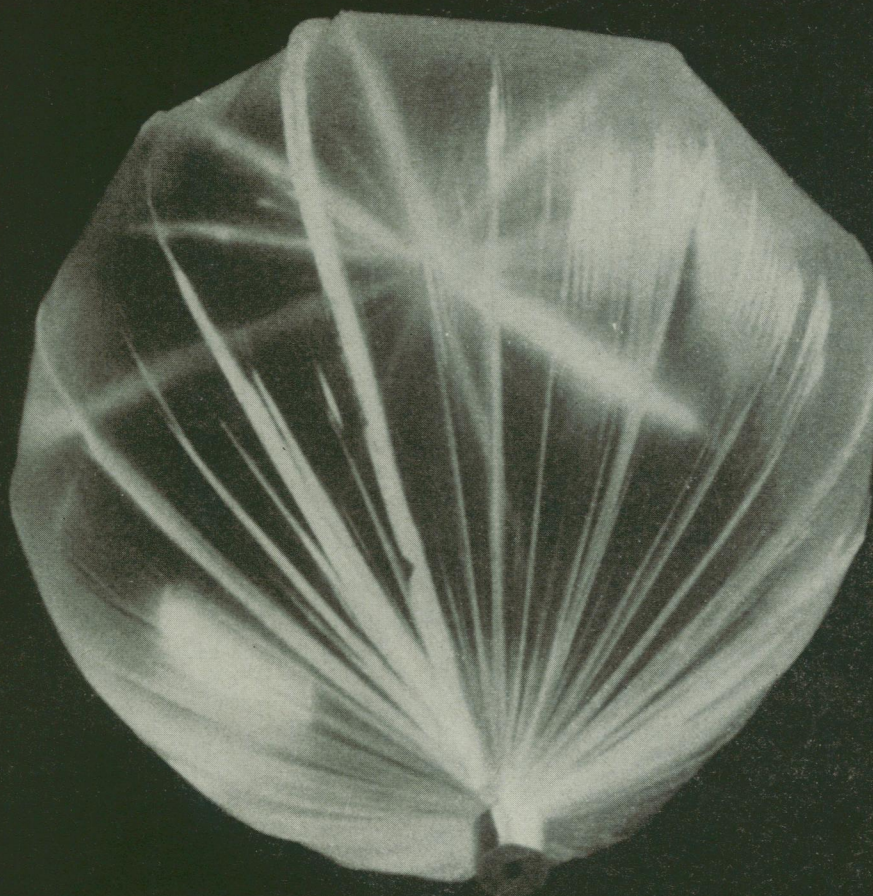
October 11, 1958

VOL. 74 NO. 15 PAGES 225-240

SCIENCE NEWS LETTER

®

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Hurricane Balloon

See Page 227

A SCIENCE SERVICE PUBLICATION

A Special Message to the Readers of Science News Letter

In order to improve our service to the public we ask you to join us and help plan a program of research activities by answering a few questions. These are designed to guide our engineering department in creating new equipment which will assist teachers, scientists and parents as well as scientific amateurs in their work.

For your cooperation we are making available a special pre-release announcement of new products at prices 20%-50% below the nationally advertised. To be eligible for these announcements be sure to validate the form at the bottom of the page after you have filled in the questionnaire.

1. What new scientific equipment or kits would you like to see available?

2. Are there special scientific toys or books you would like for your children? Please list.

3. In the following boxes check those subjects that interest you. Put a number to indicate order of preference if any.

- | | | |
|--------------------------------------|---------------------------------------|---------------------------------|
| <input type="checkbox"/> Astronomy | <input type="checkbox"/> Electronics | <input type="checkbox"/> Others |
| <input type="checkbox"/> Biology | <input type="checkbox"/> Kit building | _____ |
| <input type="checkbox"/> Chemistry | <input type="checkbox"/> Exploring | _____ |
| <input type="checkbox"/> Physics | <input type="checkbox"/> Geology | _____ |
| <input type="checkbox"/> Archaeology | <input type="checkbox"/> Rocketry | |

4. Would you like to know more about the education of gifted children? Yes No

5. If answer to 4 is yes which particular areas would you want to know more about:

- Selection of schools Books Toys Games
 Guiding extra-curricular activities
 Other scientific equipment

6. Did you buy scientific equipment in 1958?

- Yes No
What did you buy?

7. Do you intend to make purchases soon? Yes No
What?

8. (Optional) Your occupation

- | | |
|---|--|
| <input type="checkbox"/> Professional scientist specialty | <input type="checkbox"/> Student |
| <input type="checkbox"/> Physician | <input type="checkbox"/> Other (explain) |
| <input type="checkbox"/> Teacher | _____ |
| <input type="checkbox"/> Scientific amateur | _____ |

9. Are you interested in special reports on new equipment?
 For yourself For teaching and entertaining children

10. Other suggestions and comments

VALIDATE THIS RESERVATION FORM for special private price offerings on new products.

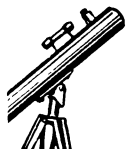
Name _____

Address _____

OLIVER GARFIELD CO., INC. Dept. SL-108-B 108 E. 16th St., N. Y. 3, N. Y.

OPTICAL BARGAINS

See the Stars, Moon, Planets Close Up!
3" REFLECTING TELESCOPE
 60 to 160 Power — An Unusual Buy!



Famous Mt. Palomar Type
 Assembled—ready to use! You'll see the Rings of Saturn, the fascinating planet Mars, huge craters on the Moon, Star Clusters, Moons of Jupiter in detail. Galaxies! Aluminized and overcoated 3" diameter high-speed f/10 mirror. Equatorial mount with lock on both axes. An Optical Finder Telescope, always so essential, is also included. Low cost

accessory eyepiece available for power up to 320. Sturdy, hardwood, portable tripod. Free with scope—valuable star chart and 272 page "Astronomy Book." Order by Stock No. Send check or M.O.—Money-back guarantee!
Stock No. 85-050-Q \$29.95 Postpaid

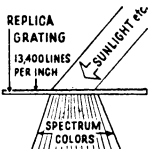
1 1/4" ASTRONOMICAL TELESCOPE up to 270X!



Mt. Palomar type. Up to 270 Power. A fine Reflector Telescope complete with real Equatorial Mount and Tripod and 6X Finder. Aluminum tube, 4 1/4" dia. mirror, holder, 2 eyepieces and mounted Barlow Lens for 40X, 90X, 120X and 270X. Low cost accessory eyepiece available for power up to 540. Shipping wt. approx. 25 lbs.

Stock No. 85-008-Q, complete, \$74.50 f.o.b. Barrington, N. J.

REPLICA GRATING Low, Low Cost



It's here—after decades of effort. Replica Grating—on film—at very low price. Breaks up white light into full spectrum colors. An exciting display. 13,400 lines per inch, running long way on film 8" wide—grating area 7 1/2". Thickness about .005". Dispersion about 24°. Use it for making spectroscopes, for experiments, as a fascinating novelty. First time available such large size—so cheaply. Comes in clear plastic protector.
Stock No. 40,267-Q piece 8"x11" . . . \$1.50 pstpd.
Stock No. 50,180-Q piece 8" x 6 ft. . . \$5.95 pstpd.

LOW COST SCIENCE TEACHING AIDS



HAND STROBOSCOPE—Held in hand—rotated with finger. View through slits—motion of fan blades, other fast moving objects apparently stopped. Flexible black plastic disc, 3" dia.—6 slits, friction mounted to prevent breakage—sturdy wooden handle. Prices so you can provide full student participation.
Stock No. 90,001-Q \$3.00
 Plus postage & packing .35

Total \$3.35



COILED SPRING-WAVE DEMONSTRATOR
 Triple length model of the popular "walk down the step" type toy, found to be excellent for demonstrating wave motion, observing pulses, understanding superposition and cancellation, etc. 3" dia., 6" long when compressed—expands out to approx. 50 ft.
Stock No. 90,002-Q \$2.00
 Plus postage & packing 50¢
Total \$2.50



TWO-STAGE ROCKET TOY—Simple, safe—demonstrates principles of jet rockets. Uses water and air as fuel. First stage soars up 200 to 300 ft.—then 2nd stage is automatically released, going still higher. A 2nd stage satellite is also included and may be substituted. Made of Butyrate plastic. Set includes fuel supply tank and air injection pump.
Stock No. 70,157-Q . . . \$2.98 pstpd.

RIPPLE TANK—Now available . . . as well as other teaching aids. If interested, write to have name included on our mailing list for BULLETINS NO. 50Q.

FREE CATALOG-Q

Yours for the Asking

America's No. 1 source of supply for experimenters, hobbyists. Complete line of Astronomical Telescope parts and assembled Telescopes. Also huge selection of lenses, prisms, war surplus optical instruments, parts and accessories. Telescopes, microscopes, satellite scopes, binoculars, infrared sniperscopes, items for making "Science Fair" projects, etc. Request Catalog-Q.

Order by Stock No.—Send Check Satisfaction Guaranteed

EDMUND SCIENTIFIC CO.
 BARRINGTON, NEW JERSEY



Free and Low Cost Science Materials

Associations and industrial companies have educational material of great use to those interested in science. Science News Letter announces from time to time such free and low cost science materials. These are a supplement to the extensive listing of free and low cost materials in the Sponsor Handbook, supplied free to sponsors of clubs affiliated with Science Clubs of America. Others may purchase it for \$1.00 from Science Clubs of America, 1719 N Street, N.W., Washington 6, D. C.

THE AMERICAN ASTRONAUTICAL FEDERATION, P. O. Box 1734, Washington 13, D. C.—Free: Information on amateur rocketry and spaceflight, including list of member organizations throughout the United States which may be contacted for additional information. Publication: The Journal of Space Flight, in planning stage. Inquiries invited.

AMERICAN DIABETES ASSOCIATION, Inc., 1 East 45th St., New York 17, N. Y.—Free sample copy: Facts about Diabetes, basic information for the interested general public and the new diabetic; 32 pp., 3 colors. Additional copies 25¢ each, \$20.00 per 100 copies—Limited quantities: Diabetes—Check facts, basic data about diabetes; ten-fold leaflet, 2 colors—Sample copy: ADA Forecast, a bi-monthly publication for diabetics and their families; 32 pp., 2 colors. Subscription, \$2.00 per year. Multiple subscriptions, special rate.—ADA Forecast Reprint Series; special prices for quantity orders. Order forms available—Free: List of audio-visual aids for diabetes education.

AMERICAN HEART ASSOCIATION, 44 East 23rd St., New York 10, N. Y. Free (from your local heart association): Heart diagram, 8 1/2" x 11", Your Heart and How It Works—Circulatory system diagram, 8 1/2" x 11".—Query your local heart association for other materials, or send requests through national office address listed above.—Free (from your local heart association): Film showings re careers in research, physiology of the circulatory system, diseases of the heart and circulation.

THE AMERICAN INSTITUTE OF CHEMISTS, Inc., 60 E. 42nd St., New York 17, N. Y.—Booklets: An Educator Observes the Chemist, by Dr. Roger Adams, 15¢—Sizing up Members for the Team, by Dr. George L. Royer; on techniques of interviewing applicants for positions, 15¢.—Opportunities in Chemistry, by Dr. Maurice J. Kelley; covers industrial positions, mimeographed, 20¢ (stamps acceptable).

AMERICAN METEOROLOGICAL SOCIETY, 3 Joy St., Boston 8, Mass.—Free: Current information on careers in and preparation for the field of meteorology, including listing of colleges and universities.—Reprints from popular weather magazine and other appropriate literature.—Listing of Workshop for Weathermen, reference to "how to" articles, particularly useful to amateur weathermen or teachers, is among the materials.—Selected bibliographies of advanced and elementary texts in the field of meteorology and books for the layman are appropriately referenced.

THE AMERICAN SOCIETY OF LANDSCAPE ARCHITECTS, Inc., 9 Park St., Boston 8, Mass.—Free leaflets: Landscape Architecture as a Future Life Work (2 pp.)—Educational Requirements in Landscape Architecture (2 pp.). Booklet: The Landscape Architect and Land Planning (4 pp.), 10¢. Magazine: Landscape Architecture, \$4.00 per year (quarterly).

Science News Letter, October 11, 1958

RADIO

Saturday Oct. 18, 1958, 1:35-1:45 p.m., EDT

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio network. Check your local CBS station.

Dr. Peyton Rous, member emeritus Rockefeller Institute for Medical Research, New York, and Albert Lasker Award Winner 1958 will talk on "The Life History of a Cancer."

SCIENCE NEWS LETTER

VOL. 74 OCTOBER 11, 1958 NO. 15

Edited by WATSON DAVIS

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N.W., Washington 6, D. C., NORTH 7-2255. Cable Address: SCIENSERVC.

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00; 3 yrs., \$14.50; ten or more copies in one package to one address, 7 1/2 cents per copy per week; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

Copyright © 1958 by Science Service, Inc. Reproduction of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicated services issued by Science Service. Science Service also publishes CHEMISTRY (eight times a year) and THINGS of Science (monthly).

Printed in U.S.A. Entered as second class matter at the post office at Washington, D. C., under the act of March 3, 1897. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40 P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283) authorized February 28, 1950. Established in mimeograph form March 13, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Reader's Guide to Periodical Literature, Abridged Guide, and the Engineering Index. Member Audit Bureau of Circulation.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: William W. Rubey, U. S. Geological Survey; Wallace R. Brode, National Bureau of Standards; Douglas Whitaker, Rockefeller Institute for Medical Research. Nominated by the National Academy of Sciences: Edward U. Condon, Washington University; Harlow Shapley, Harvard College Observatory; Phillip Bard, Johns Hopkins University. Nominated by the National Research Council: I. I. Rabi, Columbia University; Leonard Carmichael, Smithsonian Institution; John R. Dunning, Columbia University. Nominated by the Journalistic Profession: O. W. Riegel, Washington and Lee University; Michael A. Gorman, Flint Journal; Lee Hills, Detroit Free Press. Nominated by the Scripps Estate: Edward J. Meeman, Memphis Press-Scimitar; Frank Ford, Washington, D. C.; Charles E. Scripps, Cincinnati, Ohio.

Officers—President: Leonard Carmichael; Vice President and Chairman of Executive Committee: Charles E. Scripps; Treasurer: Wallace R. Brode; Secretary: Watson Davis.

Staff—Director: Watson Davis. News Editor: Ralph Segman. Writers: Helen Buechl, Ann Ewing, Jane Marye, Benita Tall, Majorie Van de Water, Howard Simons (on Nieman Fellowship leave). Science Youth Division: Harold A. Edgerton, Joseph T. Kraus, Dorothy Schriver, Shirley Moore. Photography: Fremont Davis. Production: Priscilla Howe, Marcia Nelson. Syndicate Sales: Hallie Jenkins. Interlingua Division in New York: Alexander Gode, 80 E. 11th St., GRamercy 3-5410. Advertising Manager: Fred A. Moulton, METropolitan 8-2562.

Kodak reports on:

making your own decisions in color on paper . . . 1,000,000 program chairmen
and how to help them . . . why 5,000 \$5 bills were stuffed into our till

Be creative, if you insist

Persons who deplore photography as mechanistic submergence of the human spirit may, if they wish, go on sketching anatomical specimens with a charcoal pencil and then retire to the library to enjoy their personal collections of authenticated original Botticellis. But here's the dope on the new *Kodacolor 135 Film* for miniature cameras—in case you prefer photography. It is the first Kodak color film expressly made for obtaining color prints with a 35mm camera.

You bring your exposed film to your dealer. He sends it to a color processor—of which gentry Kodak is one. Kodak provides 2½ x 3½-inch enlargements (2X from the 35mm negative) at 23¢ each list, or 3½ x 5's (3X) at 32¢ list. To compensate for numerous unknowns along the way, we have to exercise (electronically) for each negative an individual judgment of the color balance you would like. By dint of intensive studies employing techniques of experimental psychology and statistical analysis and by further dint of having made quite a pile of satisfactory prints already, we generally hit it right.

If your subject is a paint sample before and after fading instead of someone's blond granddaughter in front of a rose arbor and you're going to a color lab for a custom job, it wouldn't be a bad idea to include a neutral grey card outside the area of interest in the original picture. If you ask to have the grey card rendered as grey and then cropped off, no color processor can go far off faithful color rendition of your subject.

You have an alternative to color lab processing, of course. For 75¢ a Kodak dealer will sell you a copy of the brand new Kodak Data Book, "Printing Color Negatives." You can study that and then make your own prints and your own decisions, using the right Kodak chemicals and *Kodak Ektacolor Paper* (formerly called Kodak Color Print Material, Type C).

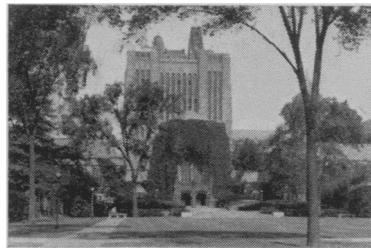
Try it. During that first night in the darkroom the human spirit will find plenty to keep it occupied.

A talisman from New Haven

We manufacture 16mm motion picture projectors and film. The projectors are sold by audio-visual dealers, to be found in many cities. The film is purchased by motion

picture producers, who place suitable images on it, so that there shall be some further purpose served by running it through the projectors sold by the audio-visual dealers. Our intentions are direct and praiseworthy. We want large numbers of persons to visit the audio-visual dealers, to discuss with them such matters as the advantage of a 25-watt amplifier over a 15-watt amplifier, and to conclude each such visit with a substantial order for each of the four current models of *Kodak Pageant Sound Projectors*. We also want a large increase in the number of new 16mm films produced. At latest count, only 77 new films were being professionally produced in the United States each day.

Finding ourselves in mid-20th century, we have to proceed toward these simple objectives by sophisticated routes. We use more than mere words for persuasion. We employ graphic communication. From the Yale News Bureau, we acquire a photograph of their serene campus.



We assure the Bureau that no endorsement of us or our works is to be implied. The photograph serves only as a visual symbol of scientific objectivity.

Next we establish why we picture Yale instead of some other equally serene haven of objectivity. Yale was the site of two important conferences at which learned psychologists and successful communicators met and scrutinized the obstacles to wider and wiser use of films, slides, sound filmstrips, etc., in conveying information, skills, or attitudes from one group of heads to another.* A second Yale angle is that two of its professors of psychology have prepared a scholarly evaluation of scientific principles

*The obstacles haven't been too bad, mind you. The nation's schools manage to keep 171,000 16mm projectors busy, while the churches and their affiliates operate another 90,000. Business firms own almost as many as the schools. Over 3500 companies and trade associations currently sponsor one or more of their own 16mm movies. Eager to get them are the program chairmen of the estimated 1,000,000 groups in the U.S.A. that have 50 or more members and meet regularly. That's a lot of P.-T.A.

for maximum learning from motion pictures and other audio-visual media. In the native patois of their discipline they say that movies are fine for teaching and suggest lines of research on how to improve them even further than they have already been improved by all the research they cite.

Their views and those of the conferees are given in a book entitled "Graphic Communication—and the Crisis in Education," obtainable from the Department of Audio-Visual Instruction of the National Education Association, 1201 16th Street, N.W., Washington 6, D.C. We suggest the hard-cover edition of \$2. It makes just the right noise when slapped down at the opposite end of the table from any finance committee member who insists on something scientific that he can take home in his briefcase.

The stickum of last resort

For *Eastman 910 Adhesive*, of which the active ingredient is methyl-2-cyanoacrylate, we now have a slogan—"the adhesive to try if no other will do."

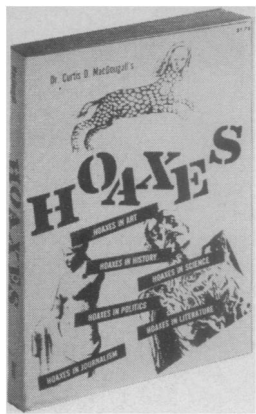
We are just being sensible. Its price by the ounce is \$10; special pound price, \$75. It *does* make possible some distinctly advantageous new assembly techniques in a large number of industries. So we gather from the correspondence incidental to the 5,000 orders filled during the past year. It bonds virtually everything (except silicones and polyolefins, else how could we deliver it?).

The biggest plus is the speed at which enormous bond strength is developed within minutes after application of this thin, clear liquid to one of the adherents. Within hours the tensile strength of its bond to steel is in the thousands of pounds per square inch. In the case of glass, rubber, or wood, bonds are stronger than the material itself. There is virtually no shrinkage on setting. No heating, no great squeezing, no evaporation is required. The bond, however, should not be depended on for too many weeks at temperatures above 175°F, particularly in the presence of much moisture. That's the minus.

In case Eastman 910 Adhesive sounds more interesting now than it did when we practically swamped our boat by offering samples at \$5 an ounce, write to Eastman Chemical Products, Inc., Department E910A, Kingsport, Tenn. (Subsidiary of Eastman Kodak Company).

Prices stated are subject to change without notice.

Kodak
TRADE MARK



TEST YOUR GULLIBILITY

How many of these items do you believe?

1. **ITEM.** The Mona Lisa in the Louvre is a fake; the real Mona Lisa is owned by a Texas oilman, who purchased it from the forger who made a substitution . . .
2. **ITEM.** In 1933, a 300-foot monster was discovered in Loch Ness, in Scotland . . .
3. **ITEM:** On the anniversary of the death of Rudolf Valentino, a mysterious "Lady in Black" appeared at Valentino's tomb . . .
4. **ITEM.** During Prohibition, a 17,000-ton Floating Cafe anchored 15 miles off Fire Island for "wet" New Yorkers . . .
5. **ITEM.** The bathtub was first introduced to America in 1842; it was denounced by physicians, and when Fillmore installed the first tub in the White House he caused a scandal . . .

Each one of these items is a hoax, dreamed up by bored newspapermen, clever press agents, and pranksters. They have been among the most successful ever perpetrated. The bathtub hoax, which the late H. L. Mencken created, is still current.

HOAXES by Dr. Curtis MacDougall, Professor of Journalism at Northwestern University, examines some 300 such hoaxes in science, art, medicine, journalism, etc. He tells about hoaxes of the past: the Cardiff giant, Ireland Shakespeare forgeries, Cagliostro, Fildown man, Herschel's observations of intelligent life on the moon, and scores of others. He also describes the careers of amateur hoaxsters like W. H. D. Cole, whose life is more fascinating than most novels, and professionals, like Harry Reichenbach, who publicized the Tarzan pictures by releasing a chimpanzee dressed in an evening suit in a hotel lobby, pushed Trilby by having girls fall into hypnotic trances. **HOAXES** is not only delightful entertainment, but a work of scholarly value that will enlighten you about many things you've probably believed.

New revised edition. 23 illustrations, 347pp.
P465 Paperbound \$1.75

IMPORTANT NEW SCIENTIFIC BOOKS AND REPRINTS

Save up to \$45.00 on these inexpensive high-quality books!

P455. THE REALM OF THE NEBULAE, E. Hubble. Written by a foremost astronomer, this is the classic statement of the nature of nebulae. Non-technical. 55 illustrations. 226pp. Paperbd. \$1.50

P472. FUNDAMENTAL PRINCIPLES OF QUANTUM MECHANICS, WITH ELEMENTARY APPLICATIONS, E. C. Kemble. Rigorous basic examination, treating hundreds of problems in great detail. "Of great value." Linus Pauling. 611pp. Paperbd. \$2.95

P456. THEORY OF THE PROPERTIES OF METALS AND ALLOYS, N. Mott, H. Jones. Individual metals and alloys, showing how crystal, magnetic, electric, optical qualities are related to chemical. Covers theoretical and experimental. 339pp. Paperbd. \$1.85

P467. THEORETICAL MECHANICS, STATICS AND DYNAMICS OF A PARTICLE, W. Macmillan. Clear, thorough coverage in classical mechanics, self-contained, comprehensive, on basic problems. 180 figures. 448pp. Paperbd. \$2.00

P451. DIFFERENTIAL EQUATIONS, F. Moulton. Rigorous detailed account of non-elementary processes, by foremost mathematician. 222 problems. 410pp. Paperbd. \$2.00

P459. MICROWAVE TRANSMISSION DESIGN DATA, T. Moreno. Design and construction of ultra high frequency transmission lines and equipment. Practical, concrete engineering approach. 257pp. Paperbd. \$1.50

P460. ELEMENTS OF NON-EUCLIDEAN GEOMETRY, D. Sommerville. Unusual as progressive text, with 126 practice examples. 133 figures. 280pp. Paperbd. \$1.50

P462. INTRO. TO BESSEL FUNCTIONS, F. Bowman. Properties, applications in rigorous treatment. "Very useful." NATURE. 226 problems. 27 figures. 135pp. Paperbd. \$1.35

P452. INTRO. TO FOURIER METHODS AND LAPLACE TRANSFORMATIONS, P. Franklin. Intro. requiring only elementary calculus, very clear exposition. (Formerly Fourier Methods.) 828 problems, answers. 300pp. Paperbd. \$1.75

P461. THEORETICAL MECHANICS, INTRO. TO MATHEMATICAL PHYSICS, J. Ames, F. Mur-naghan. Rigorous development for advanced student. Wide coverage, unusually thorough on gyroscopic, baryscopic material; classical, basically but includes special relativity. 159 problems. 417pp. Paperbd. \$2.00

P454. VECTOR ANALYSIS, WITH INTRO. TO TENSOR ANALYSIS, A. Willis. Only elementary calculus needed for this clear exposition. Examples and expositions, also 114 problems. 312pp. Paperbd. \$1.75

P164. INTRO. TO SYMBOLIC LOGIC, Susanne Langer. Favorite introduction to Schroeder, Russell, Whitehead systems. 368pp. Paperbd. \$1.75

P4290. HISTORY OF MATHEMATICS, D. E. Smith, 2 vol. set, ranging from primitive man to beginning of 20th century, up through calculus. Covers 1200 mathematicians; 1st vol. history, 2nd vol. special topics. 550 unusual illustrations, semipopular coverage. 1325pp. Paperbd. 2 volume set \$5.00

P434. MATHEMATICAL FOUNDATIONS OF INFORMATION THEORY, A. Khinchin. 1st English translation of basic introduction to important topics. Rigorous. 128pp. Paperbd. \$1.35

P448. HYPERMODERN CHESS, AS DEVELOPED IN THE GAMES OF ITS GREATEST OPPONENT, A NIMZOVICH, Nimzovich revolutionized chess; his ideas are analyzed in his best games. 230pp. Paperbd. \$1.35

P457. TREASURY OF THE WORLD'S COINS, Fred Reinfeld. Historical account of coins of world, and their cultural background. Values, over 575 illustrations, 224pp. 6 1/2 x 10". Paperbd. \$1.75

P367. 101 PUZZLES IN THOUGHT AND LOGIC, C. Wylie. No special knowledge needed for weeks of amusement and mental exercises. 128pp. Paperbd. \$1.00

P295. HOW TO CALCULATE QUICKLY, H. Sticker. Tried, true method for developing number sense; not tricks, but 9,000 exercises and answers that teach techniques not taught in schools. 256pp. Paperbd. \$1.00

P394. FADS & FALLACIES IN THE NAME OF SCIENCE, Martin Gardner. Standard coverage of fads, cults, eccentric theory; Atlantis, dianetics, flying saucers, cyrene energy, medical fallacies, etc. Recommended to all. 385pp. Paperbd. \$1.50

P370. CALCULUS REFRESHER FOR TECHNICAL MEN, A. A. Klaf. Unique refresher for all who wish to brush up; 756 basic questions, detailed answers, with emphasis on practical application. 566 problems, also odd numbers answered. 436pp. Paperbd. \$2.00

P395. TREES OF THE EASTERN AND CENTRAL UNITED STATES, W. Harlow. Middle-level serious study, enables you to identify 140 different trees; full of wood-lore, interesting information. Over 600 photos. 301pp. 4 1/2 x 6 1/2". Paperbd. \$1.35

P377. FOUNDATION OF PHYSICS, R. Lindsay, H. Margenau. Bridge between elementary and technical works, with stress on ideas and methods. Classic physics, plus relativity, quantum mechanics. "Unreservedly recommended." NATURE. 548pp. Paperbd. \$2.45

P372. FOUNDATIONS OF SCIENCE, PHILOSOPHY OF THEORY AND EXPERIMENT, N. Campbell. Investigates most fundamental concepts, laws of nature, definitions of properties, similar basic concepts. "A great feat." Andrade, in NATURE. 567pp. Paperbd. \$2.95

P198. MATHEMATICAL PUZZLES FOR BEGINNERS AND ENTHUSIASTS, G. Mott-Smith. 158 puzzles of inference, algebra, plane figures, permutations, etc. Solutions. 248pp. Paperbd. \$1.00

P474. CANTERBURY PUZZLES, H. F. Dudeney. Chaucer's Canterbury pilgrims set one another puzzles. Wide range, elementary to advanced. 262pp. Solutions. Paperbd. \$1.25

P473. AMUSEMENTS IN MATHEMATICS, H. Dudeney. Giant collection of 430 puzzles, problems, paradoxes, brain-teasers by England's foremost puzzler. "Best of its kind." NATURE. Solutions. 265pp. Paperbd. \$1.25

Two important new books never before available in English!

P453. INTRODUCTION TO SYMBOLIC LOGIC AND ITS APPLICATION, Rudolf Carnap. 1st English translation of Einführung in die symbolische Logik, by the world's foremost symbolic logician. It is a rigorous introduction to modern logic, concerned with both techniques and application to math, language, physics, biology, and scientific method. Over 300 exercises are provided. "Of the rank of a masterpiece." ZENTRALBLATT F. MATH. "By far the most convenient for the student of science." BRIT. J. FOR PHILOS. OF SCIENCE. 250pp. Paperbd. \$1.85

P444. SELECTED PAPERS IN QUANTUM ELECTRODYNAMICS, edited by Julian Schwinger. Dr. Schwinger, one of the foremost contributors to this field, has selected 34 epoch-making papers by such men as Dirac, Fermi, Heisenberg, Weisskopf, Retherford, Bethe, Schwinger, Oppenheimer, Pauli, Feynman, Dyson, and others. 29 are in English, the remaining five are in German, Italian, French. Preface and historical account by Dr. Schwinger. 440pp. Paperbd. \$2.45

P445. MATHEMATICAL TABLES OF ELEMENTARY AND SOME HIGHER MATHEMATICAL FUNCTIONS, H. Dwight. 2nd enlarged edition with Bessel functions. 240pp. Paperbd. \$1.75

P464. HOW TO MAKE A TELESCOPE, J. Texereau. Noted French optical engineer gives complete instructions for making Newtonian 8" f6, f8 reflecting telescope, all with simple equipment. 225 figures, sources of supply. 204pp. 6 1/2 x 10". Clothbd. \$3.50

P470. DE MAGNETE, William Gilbert. Very readable 17th century classic, first account of terrestrial magnetism, first use of word electricity, etc. Founded modern study. Motelay edition. 424pp. Paperbd. \$2.00

P469. THE VALUE OF SCIENCE, Henri Poincare. New Dover reissue of classic on roles of logical vs. intuitive thought, relations of math to physics, etc. 150pp. Paperbd. \$1.35

P44950. STUDIES ON THE STRUCTURE AND DEVELOPMENT OF VERTEBRATES, E. S. Goodrich. Unabridged reissue of the basic work on comparative anatomy, the standard survey of the phylum vertebrata, covering morphology, evolution, etc. of spine, limbs, head, ear, vascular, nervous systems, lungs, excretory, genital areas, etc. "For many a day this will certainly be the standard work on vertebrate morphology." J. OF ANATOMY. "No other book in English so thorough." SCIENCE PROGRESS. New 69-page biography of Goodrich, by A. C. Hardy. 754 illustrations. Bibliography of 1186 references. Total of 906pp. (When out-of-print, this set has sold for \$50 on the rare occasions when it was available.) Two vol. set. Paperbound \$5.00

Save \$5.05 on this giant volume!
Limited quantities available!

PRAS. AMERICAN SCIENCE AND INVENTION, A PICTORIAL HISTORY, Mitchell Wilson.

This 250,000 word book provides a delightful yet scientifically impeccable history of science and invention in America, from Franklin up to the 1950's. It covers both theory and application, pure sciences and engineering. Dr. Wilson, who was an assistant to Fermi, writes informatively, and his work has been welcomed by both professionals and beginners. It is a wonderful gift book. "Very remarkable job." CHICAGO TRIBUNE. "Entertaining, far more substantial than most." NEW YORKER. More than 1100 fascinating pictures, 438pp. 9 x 12. Formerly \$10.00 — Now only \$4.95

All books standard 5 1/2" x 8" unless otherwise indicated.

Dept. 166P, Dover Publications, Inc.
920 Broadway, N. Y. 10, N. Y.

Please send me the following books in the quantities indicated. Indicate number and price:

.....
.....
.....

I am enclosing \$..... in full payment. Payment in full must accompany all orders except those from public institutions or libraries. Please add 10¢ per book for postage and handling charges on orders less than \$5.00. Please print.

Name.....

Address.....

City..... Zone..... State.....

GUARANTEED: Your satisfaction is guaranteed. All Dover books are returnable within 10 days for full immediate cash refund.