

15¢

\$5.50 A YEAR

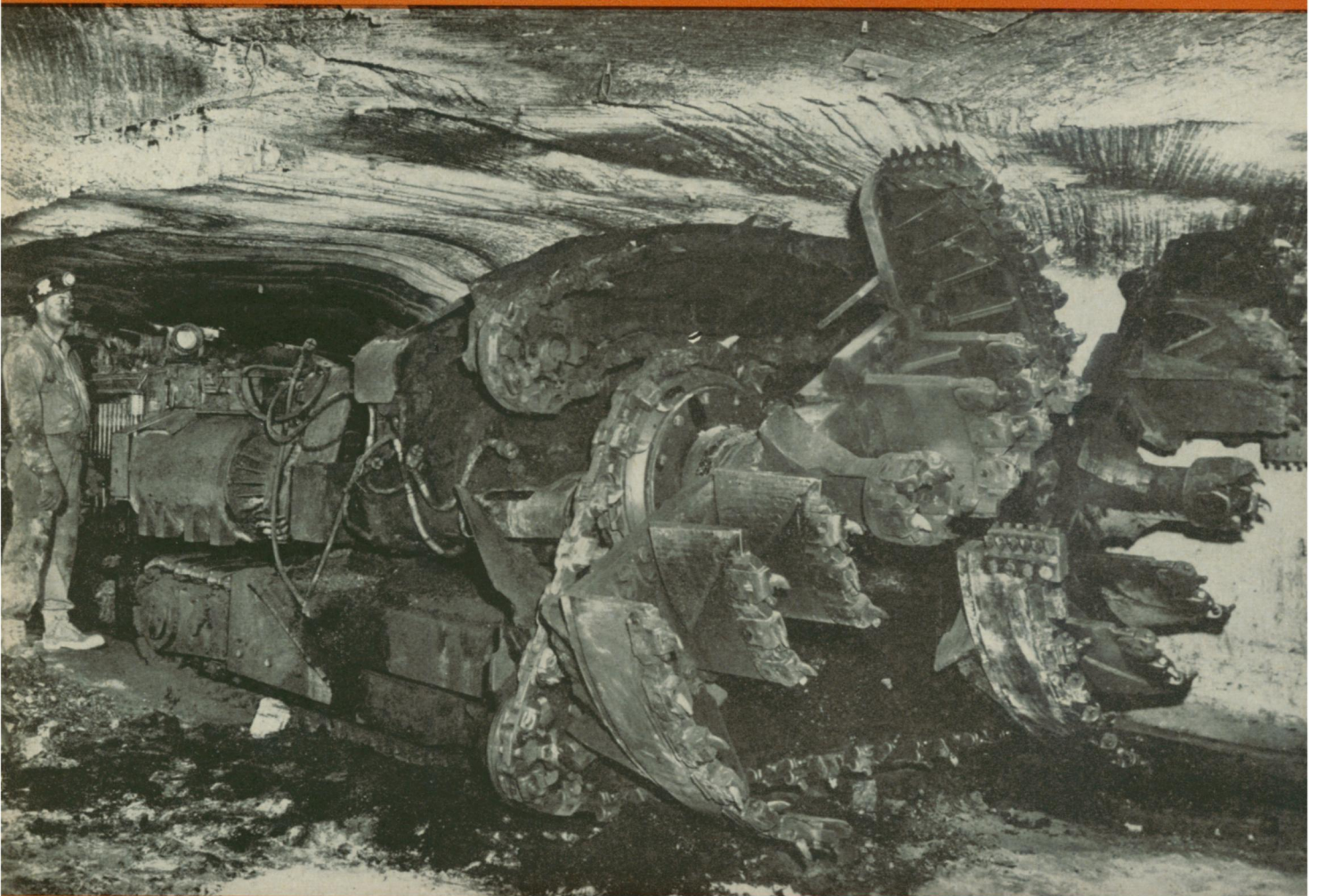
November 23, 1963

VOL. 84, NO. 21 PAGES 321-336

# SCIENCE NEWS LETTER

®

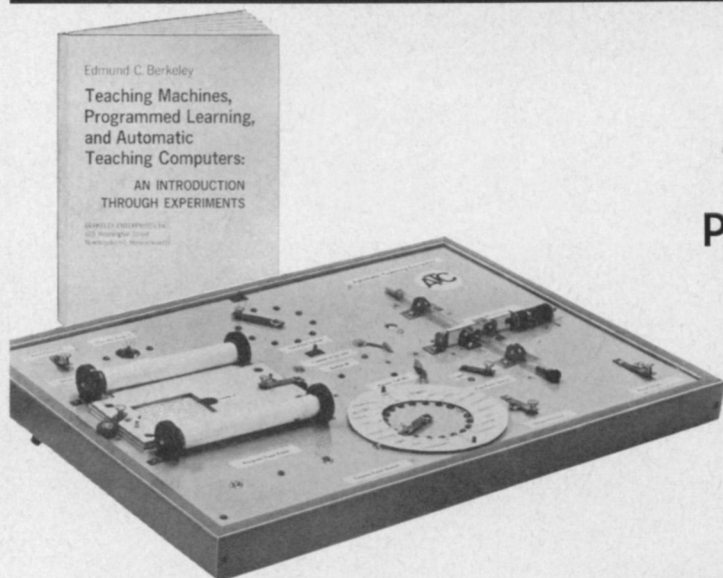
THE WEEKLY SUMMARY OF CURRENT SCIENCE



Joy Manufacturing Company

**Giant Borer**  
See Page 324

A SCIENCE SERVICE PUBLICATION



**Make over 70  
Teaching Machines  
Programmed Learning Machines  
Computing, Reasoning  
Puzzle-Solving and  
Game-Playing Machines  
with our**

## Teaching Machine and Programmed Learning Aid AUTOMATIC TEACHING COMPUTER KIT

WITH OUR TEACHING COMPUTER KIT K33, you can make over 70 small machines with electrically read punched paper tape, signal correct answers, give rewards out of a chute, keep score, etc., responding to situations in teaching, programmed learning, computing, reasoning, solving puzzles, playing games, etc. Each machine works on flashlight batteries . . . is FUN to make, FUN to use and play with, and TEACHES you—both (1) any information which can be programmed for learning in a series of items or questions on paper tape, and (2) information about how to put together electrical, computing, reasoning, and teaching circuits and devices. All connections with nuts and bolts—no soldering required—completely safe. The TEACHING COMPUTER KIT K33 is the result of 15 years' of our design and development work with miniature mechanical brains and scientific educational kits, including the Brainiac Electric Brain Construction Kit K18, the Probability and Statistics Kit K22, Simon (miniature automatic digital computer with 129 relays), Squee (electronic robot squirrel), etc.

**ONLY A FEW OF THE MACHINES THAT YOU CAN MAKE:** *Teaching Machines*—the Pat-on-the-Back Machine; the Spelling-the-Sound-F Machine; the Answering Machine; the Bronx Cheer Machine; the Forgive-and-Forget Machine; the Infinitely-Rewarding Machine; the One-Reward-per-Frame Machine; the Automatic Teaching Computer; Scoring Machine for Honorable Student; Scoring Machine for Student with Weak Conscience; Podunk University's Pigeon Rewarding Machine; the Answering Machine with 100 Answers; the Answering Machine with 540 Answers . . . *Logic Machines*: the AND/OR Machine; the OR ELSE Machine; the NOT BOTH Machine; the IF AND ONLY IF Machine; the Logical Syllogism Machine. . . *Computing Machines*: Machines for Adding 7, Squaring, Finding Cube Root, Decimal-to-Binary Converter. . . *Puzzle-Solving Machines*: the Case of the Missing Hyphen; the Riddle of Sundorra; Hawkshaw the Detective's Machine Made for Bluebeard; the Mysterious Multiples of 369; the Waxing and the Waning Moon; the Daisy Petal Machine. . . *Game Playing Machines*: Nim; the Game of 21 in Sundorra; Black Match.

**TEACHING MACHINE AND PROGRAMMED LEARNING KIT K33**  
 . . . another Berkeley Enterprises' kit with limitless possibilities and hours of built-in-fun and instruction . . . \$19.95, LESS \$2.00 PRE-PUBLICATION DISCOUNT FOR ORDERS RECEIVED PRIOR TO NOVEMBER 30th or \$17.95. (For shipment west of Mississippi, add 80 cents; outside U.S., add \$2.10)

**WHAT COMES WITH YOUR KIT K33?  
Every special part needed to make the experiments  
and mechanisms in the kit including:**

- A Tape Mechanism which rolls punched paper tape through a reading station where it is read electrically.
- A Chute Mechanism which automatically delivers rewards or computes scores.
- Four Multiple Switches operating electrically.
- A Flip-Flop operating mechanically and electrically.
- Pre-punched and pre-labeled Panel Board.
- Lamps, Buzzer, small Balls for rewards or scoring.
- Hand Punch for your own program tapes.

A total of over 400 parts, of more than 50 kinds—everything you need to make hundreds of different computing, reasoning and teaching machines.

#### ALSO

- 15 Illustrative learning programs (Skinner style, Pressey style, etc.) on pre-punched paper tape totaling over 500 frames including as subjects: Physics—Light, Heat and Incandescence; Geological Time Scale; Boolean Algebra—Introduction; Elementary Algebra—Sets, Natural Numbers, Variables; Hamlet's Soliloquy; Chess Strategy Using Pawns; Management—PERT Method; Pharmacology—Corticosteroids; Spelling the Sound F; Spelling Long E with EI or IE; Chemistry—Atomic Structure; Geometry—Some Aspects of Symmetry; Finding Approximate Square Roots; Meaning of Certain Proverbs—In total, 15 samples so that you can make your own programmed learning tapes . . . to run on your own teaching computer.
- Full Descriptions of over 60 Experiments.
- Book "Teaching Machines, Programmed Learning and Automatic Teaching Computers: An Introduction through Experiments" by Edmund C. Berkeley—over 800 pages—over 100 diagrams.

**7-Day Full Refund If Not Satisfactory**

MAIL THIS COUPON OR A COPY OF IT

BERKELEY ENTERPRISES, INC.  
815 Washington St., R350, Newtonville, Mass. 02160

Please send me when published the Teaching Machine and Programmed Learning Kit K33. (Returnable in 7 days for full refund if not satisfactory—if in good condition.) I enclose \$\_\_\_\_\_ in full payment.

Name \_\_\_\_\_

Address \_\_\_\_\_

GET READY FOR THE SPACE and SCIENCE ERA! SEE SATELLITES, MOON ROCKETS

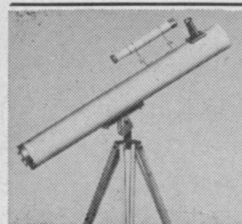
# AMAZING SCIENCE BUYS

for FUN, STUDY or PROFIT



## See the Stars, Moon, Planets Close Up! 3" Astronomical Reflecting Telescope (Famous Mt. Palomar Type)

Photographers! Adapt your camera to this Scope for excellent Telephoto and moon shots!



### 60 to 180 Power An Unusual BUY!

Assembled—Ready to use! You'll see the Rings of Saturn, the fascinating planet Mars, huge craters on the Moon, phases of Venus, Star Clusters, Moons of Jupiter in detail, Galaxies! Equatorial mount with lock on both axes. Aluminized and overcoated.

3" diameter high-speed f/10 mirror. Telescope comes equipped with a 60X eyepiece and a mounted Barlow Lens, giving you 60 to 180 power. An Optical Finder Telescope, always so essential, is also included. Sturdy, hardwood, portable tripod. FREE with Scope: Valuable STAR CHART plus 272-page "HANDBOOK OF HEAVENS," plus "HOW TO USE YOUR TELESCOPE" BOOK.  
Stock No. 85,050-Q.....\$29.95 Postpaid  
4 1/4" Reflecting Telescope—up to 255 Power, all-metal pedestal mount.  
Stock No. 85,105-Q \$79.50 F.O.B. Barrington, N. J.

## 'FISH' WITH A WAR SURPLUS MAGNET

### Go Treasure Hunting on the Bottom



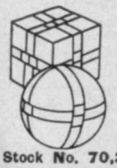
Great idea! Fascinating fun and sometimes tremendously profitable! Tie a line to our 5-lb. Magnet—drop it overboard. In river, lake or ocean. Trawl it along the bottom—your "treasure" haul can be outboard motors, anchors, fishing tackle, all kinds of metal valuables. 5-lb. Magnet is war surplus—Alnico V Type. Govt. cost \$50. Lifts over 150 lb. on land—much greater weights under water.  
Stock No. 70,571-Q—5-lb. Magnet. \$12.50 Postpaid  
Stock No. 70,570-Q—3 1/2-lb. size. \$8.75 Postpaid  
Stock No. 70,572-Q—7 1/2-lb. Magnet. \$18.75 Ppd.  
Stock No. 85,152-Q—15 1/4-lb. size lifts 350 lbs.  
\$33.60 FOB

## SCIENCE TREASURE CHESTS

For Boys—Girls—Adults  
Science Treasure Chest—Extra-powerful magnets, polarizing filters, compass, one-way-mirror film, prism, diffraction grating and lots of other items for hundreds of thrilling experiments, plus a Ten-Lens Kit for making telescopes, microscopes, etc. Full instructions included.

Stock No. 70,342-Q.....\$5.00 Postpaid  
Science Treasure Chest Deluxe—Everything in Chest above plus exciting additional items for more advanced experiments including crystal-growing kit, electric motor, molecular models set, first-surface mirrors, and lots more.  
Stock No. 70,343-Q.....\$10.00 Postpaid

## WOODEN SOLID PUZZLES



12 Different puzzles that will stimulate your ability to think and reason. Here is a fascinating assortment of wood puzzles that will provide hours of pleasure. Twelve different puzzles, animals and geometric forms. To take apart and reassemble, give chance for all the family, young or old, to test skill, patience and, best of all, to stimulate ability to think and reason while having lots of fun. Order yours now.  
Stock No. 70,205-Q.....\$3.00 Ppd.

## Terrific Buy! American Model OPAQUE PROJECTOR



Projects illustration up to 3" X 3 1/4" and enlarges them to 35" X 30" if screen is 6 1/2 ft. from projector; larger pictures if screen is further away. No film or negatives needed. Projects charts, diagrams, pictures, photos, lettering in full color or black-and-white. Operates on 115 volts, A.C. current. . . . 6-ft. extension cord and plug included. Operates on 60 watt bulb, not included. Size 12" X 8" X 4 1/4" wide. Weight 1 lb. 2 ozs. Plastic case.  
Stock No. 70,199-Q.....\$7.95 Postpaid

## BUILD A SOLAR ENERGY FURNACE



A fascinating new field. Build your own Solar Furnace for experimentation—many practical uses. Easy! Inexpensive! Use scrapwood! We furnish instructions. This sun powered furnace will generate terrific heat—2000° to 3000°. Fuses enamel to metal. Sets paper aflame in seconds. Use our Fresnel Lens—14" diameter. . . . f.l. 14".  
Stock No. 70,130-Q. Fresnel Lens. . . \$6.00 Pstpd.  
11" Sq. Fresnel Lens F.L. 19". Slight 2nd.  
Stock No. 70,533-Q.....\$6.00 Pstpd.

## DAZZLING DIFFRACTION JEWELRY FOR MEN AND WOMEN NOW AVAILABLE IN GOLD



This science-inspired jewelry glows with the twinkling magic of rainbows. It uses circular patterns of 1" DIFFRACTION GRATINGS REPLICATED to break up light into all the rich, deep colors of nature's grandest phenomenon. Incorporated into beautiful jewelry, these exquisite new fashion accessories are now available in lustrous gold as well as silver. Write for complete list.

ITEM	GOLD	SILVER	PRICE
EARRINGS No. 1814-Q	1827-Q	1714-Q	\$2.20
CUFF LINKS No. 1818-Q	1818-Q	1729-Q	2.20
PENDANT 3/4" Tie Clasp & Cuff Link Set	1831-Q	1743-Q	3.85
BRACELET (Six 3/4" gratings)	1816-Q	1735-Q	7.70

## New! 2 in 1 Combination Pocket-Size 50 POWER MICROSCOPE and 10 POWER TELESCOPE



Useful Telescope and Microscope combined in one amazing precision instrument. Imported! No larger than a fountain pen. Telescope is 10 Power. Microscope magnifies 50 Times. Sharp focus at any range. Handy for sports, looking at small objects, just plain snooping. Order Stock No. 30,059-Q.....\$4.50 Pstpd.

## Nem OBSERV-O-SCOPE

### Protects Against Intruders!

Now the perfect optical device for identifying callers before you open door. New revolutionary Observ-O-Scope allows wide-angle vision through door—175° in all directions, yet is only 1/2" in diam. Just drill 1/2" hole through door at eye-level and push Observ-O-Scope through flush with outside. Gives clear, sharp image without revealing your presence inside. Invaluable for homes, motels, hotels. Adjustable for wooden doors 3/4" to 2 1/2" thick. Brass finish.  
Stock No. 40,582-Q.....\$3.30 Postpaid  
Adapted for thickness less than 3/4" . . . \$3.30 Postpaid  
Stock No. 40,584-Q.....\$ .70 Postpaid

## FRY A MARBLE? TRY A LENS? MAKE JEWELRY LIKE FRYING AN EGG

A step ahead of frying marbles to make jewelry, this FRIED LENS KIT offers 15 round and oblong lenses which you can make into pendants, earrings and other unusually decorative objects. Be first in your block with Tiffany-like gem worn by the First Lady. Simple instructions included.  
Stock No. 60,350-Q.....\$2.00 Pstpd.

## ERECT IMAGE LOW POWER MICROSCOPE—5X, 10X, 20X

\$60.00 Value. . . . Only \$19.95  
Extremely sturdy with rack and pinion focusing, color corrected optics, turntable microscope body for inclined viewing. Made from war surplus optical instrument so that you actually get \$60.00 of value. Weighs 4 lbs., 13" high, 10-DAY FREE TRIAL. Accessory objectives available for powers of 15X, 30X, 40X.  
Stock No. 70,172-Q..\$19.95 Ppd.



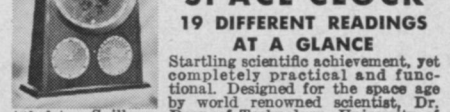
## New Zoom Microscope Eyepiece ZOOMS Powers From 30X to 2000X

Greatest microscope accessory yet! Priced amazingly low. Combines all eyepiece powers from 10X to 200X in one assembly. Twist of dial . . . without more focusing . . . without extra eyepiece changing . . . and you command powers up to 2000X. Professional all-metal quality construction, heavily plated, anodized. Fits any standard .917" dia. microscope tube. Built-in, adjustable clamping ring insures tight, mar-free attachment. Stops eyepiece changing. Coated elements. 2 1/4" lg., 1 1/2" max. dia., 5 oz. wt.  
Stock No. 60,270-Q.....\$25.00 Pstpd.

## LOW PRICED 42MM ASTRONOMICAL TELESCOPE

Achromatic Lens! Refractor Type!  
Clear, razor-sharp viewing of stars, planets, craters on moon, etc. Precision made. Color corrected achromatic two-element objective lens. The best of quality viewing at low, low cost. 42mm 1-21/32" dia.; 41" F.L.; main tube length—38". First surface mirror diagonal (ends "stoop" viewing). Removable eyepiece interchangeable. Glare stops in tube. Lens mount of brass and aluminum. 67, 100 and 200 power (200X is beyond recommended magnification for this size objective). Sturdy, plated steel clamp mount. Included free: 273-page "Handbook of the Heavens," Star Chart—and 16-page Star Booklet.  
Stock No. 80,061-Q.....\$19.95 Postpaid

## AUTOMATICALLY SHOWS TIME, TIDES, POSITION OF SUN, MOON, STARS NEW SPILHAUS SPACE CLOCK



19 DIFFERENT READINGS AT A GLANCE  
Startling scientific achievement, yet completely practical and functional. Designed for the space age by world renowned scientist, Dr. Athelstan Spilhaus, Dean of Technology, University of Minnesota. Handsome conversation piece—constantly up-to-date encyclopedia of the sky. The Spilhaus Space clock has beautiful fruitwood case and 3 sky-blue dials. Blends with decor of any home, office, club room, classroom, museum, display window, hotel, etc. Large dial shows sun position, daily sun rise and set, moon position, moon rise and set, phase of moon, low and high tide time, current stage of tide, day and month of year, current position of stars in sky, time of star rise and star set, relationships of sun, moon and stars, sidereal or star time. Left dial shows local time. Right dial shows world time including major U. S. cities and Universal (Greenwich) time. Operates on house current—requires only one simple setting for any geographic location. Measures 16" high x 11 1/2" wide x 4 1/2" deep. Presentation plaques available. Complete satisfaction guaranteed or money refunded.  
Stock No. 1201-Q.....\$150.00

## Make Your Own Astronomical Telescope GRIND YOUR OWN ASTRONOMICAL MIRROR

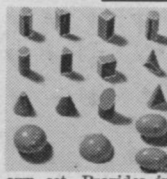


Kits contain mirror blank, tool, abrasives, diagonal mirror and eyepiece lenses. You build instruments ranging in value from \$75.00 to hundreds of dollars.

Stock #	Diam.	Mirror Thickness	Price
70,003-Q	4 1/4"	1 1/2"	\$ 7.50 ppd.
70,004-Q	6"	1 1/2"	11.50 ppd.
70,005-Q	8"	1 1/2"	19.50 ppd.
70,006-Q	10"	1 1/2"	30.75 f.o.b.
70,007-Q	12 1/2"	2 1/2"	59.95 Barrington

## UNUSUAL CHRISTMAS GIFT HEADQUARTERS

Do all your Christmas shopping easily by mail. Over 4,000 unique and inexpensive gift items. One order solves your Christmas shopping problem for family, friends, business. Guaranteed satisfaction or your money back. Over 400,000 satisfied customers.



## LOW-COST 27-PIECE GEOMETRIC SOLIDS SET

Attractive, solid orange, plastic matched set of 27 miniature geometric pieces; includes basic solids, regular polyhedrons, prisms, cones, spheroids. Ideal solid geometry teaching aid for teachers with low budgets, limited storage space. Low-cost permits each student to have his own set. Provides interesting background and shadow effects for table top photographers; invaluable to artists, mechanical drawing students; colorful, ornamental items for science or knick-knack shelf. Made to take rugged punishment. Approx. 3/4" to 1 1/4" at widest dimensions; 1/4 to 1/2 oz. wt. Complete with instructions for computing areas and volumes, definitions of each shape, suggested uses and projects.  
Stock No. 70,615-Q.....\$4.50 Postpaid

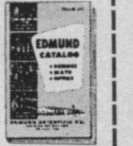
## INEXPENSIVE VAC-U-FORM KIT SKIN PACK AND VACUUM FORM PLASTIC



Hand-operated, scaled-down version of expensive commercial models. Ideally suited for low-volume work from actual objects—many applications for stores and small factories. Molds made from clay provided offer unlimited experimental areas of design and shapes. Originally made for toy field, kit has wide plastic reproducing possibilities. Includes 50 molds (letters and numbers for signs, jewelry, toys), and 65 plastic 3" x 3 1/4" sheets, clear, colored and metallized. Also includes paint, thinner, cement cutting tool, clay, brush, emery board, platform and instructions. Operates on 115-volt A.C. 10 1/4" long x 4 1/4" wide x 5 1/4" high.  
Stock No. 80,080-Q.....\$16.00 Postpaid

## MAIL COUPON FOR FREE CATALOG "Q"

COMPLETELY NEW & ENLARGED  
148 pages. Nearly 4000 Bargains  
EDMUND SCIENTIFIC CO.  
Barrington, New Jersey  
Please rush Free-Giant Catalog Q



Name.....  
Address.....  
City.....Zone..State.....

ORDER BY STOCK NUMBER . . . SEND CHECK OR MONEY ORDER . . . SATISFACTION GUARANTEED!

# EDMUND SCIENTIFIC CO. BARRINGTON, NEW JERSEY