

15¢

\$5.50 A YEAR

January 3, 1959

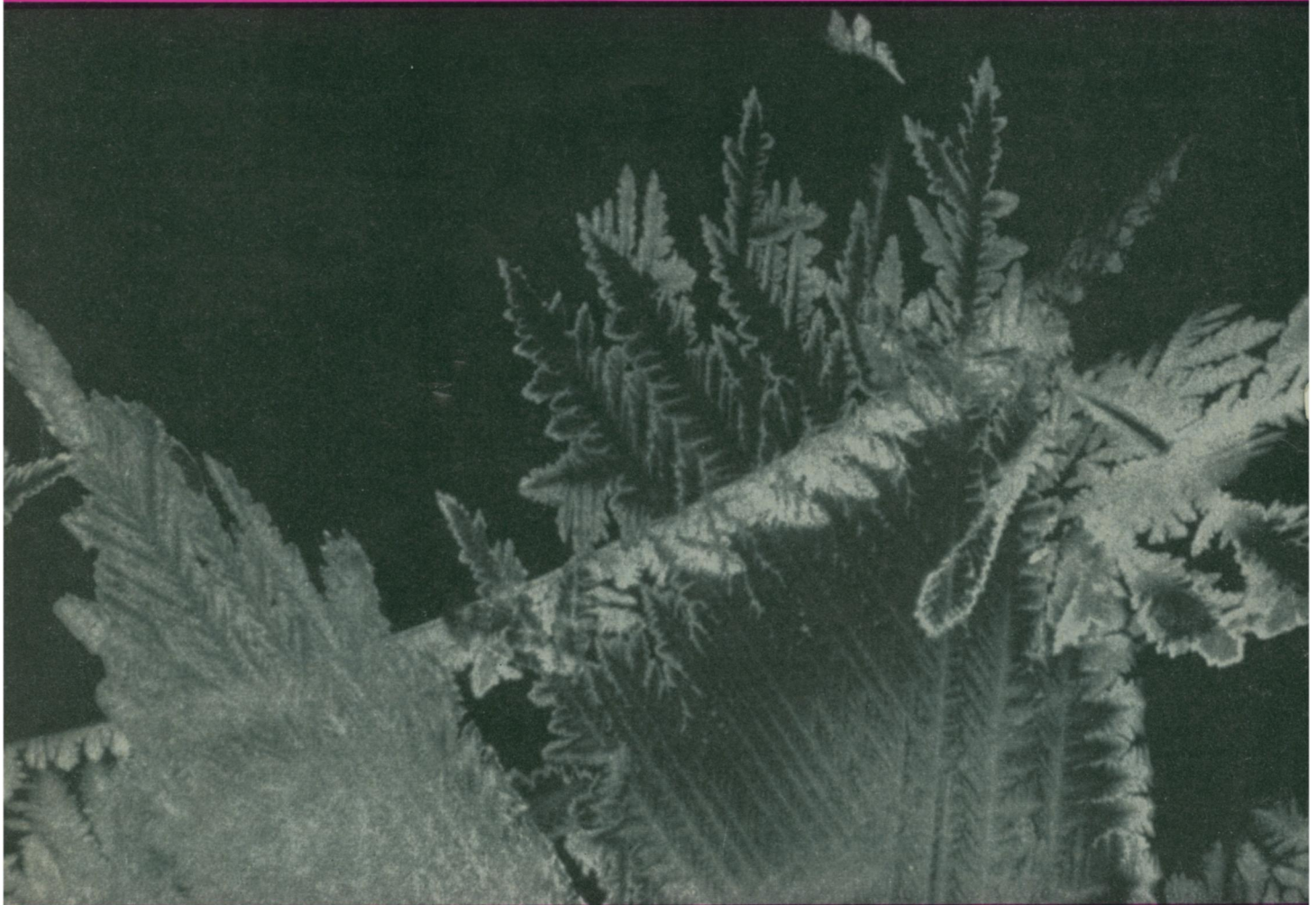
VOL. 75 NO. 1

PAGES 1-16

# SCIENCE NEWS LETTER

®

THE WEEKLY SUMMARY OF CURRENT SCIENCE

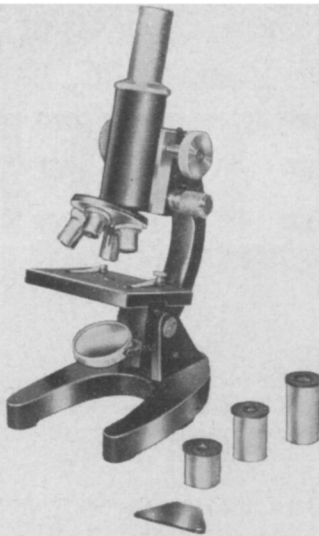


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**Ice Ferns**

See Page 6

A SCIENCE SERVICE PUBLICATION



## 900X "MICROBE HUNTER"

- The only Microscope in its class featuring **GRADE A** optics!
- Power Range 25X, 50X, 75X, 100X, 150X, 200X, 300X, 400X, 600X, 900X
- Full Range Fine Adjustment
- Safety Stop on Coarse Adjustment

This instrument—made to our rigid design specifications—has wide usage in schools, laboratories and law enforcement agencies. All of the most needed features have been incorporated to meet the requirements for diversified micro-studies. Highly recommended for serious hobbyist desiring exceptional quality at modest cost. Power range from 25X to 900X in 12 possible combinations. Geared rack and pinion coarse focusing. Micro-motion fine focusing of full range—12 complete revolutions. Safety stop prevents over rise. 36mm dual surface (plano/concave) mirror. Fixed square stage, 70mm X 80mm. Rotating 5-hole, disc diaphragm. Three Huygenian eyepieces of 5X, 10X and 15X. Four achromatic objectives of 5X, 10X, 40X and 60X. Oversize base insures stability and protects objectives. Body tilts through 60°—perfectly balanced at any angle. Complete with upright, wooden carrying case.

**F-338—List \$69.95 ..... Net \$39.95**  
(Add \$1.00 for postage and handling)

## NEW! 30X-50X "STEREO-SCOPES"

- **STEREOSCOPIC Binocular Dissecting Microscope**
- **Wide Field 3-Dimension View** • **Two Models to Choose From**

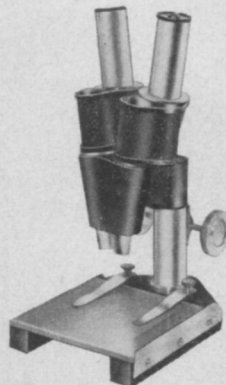
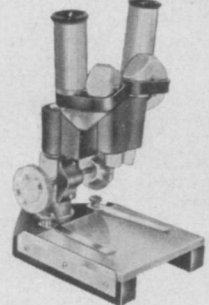
**SEMI-PRO "STEREO-SCOPE":** An especially engineered instrument featuring the stereopsis and wide view field needed in biology — petrography — archeology — mineralogy — criminology — industry — agriculture — etc. Indispensable for inspection of large specimens — small parts — surface features of gross objects — dissection — etc.

Fixed objective lenses and interchangeable eyepieces for a choice of either 30X or 50X. Prismatic binocular head with full interpupillary adjustment. Ground glass stage 3 3/16" x 3 5/16". Oversize modified horseshoe base. Rack and pinion focusing. Automatic stop prevents over rise. Overall height 9 1/2". Complete with fitted wooden carrying case.

**F-337 ..... Net \$29.95**  
(Add 88¢ for postage and handling)

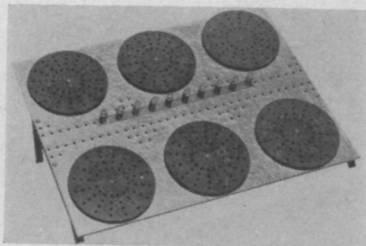
**STUDENT "STEREO-SCOPE":** A 30X stereoscopic binocular microscope — designed primarily for the student and serious hobbyist. Includes most of the features of our "Semi-Pro" model shown on this page. Fixed objective lenses and non-interchangeable eyepieces. All optics are achromatic. Ground glass stage measures 2 7/8" x 2 13/16". Overall height 7 3/4". Complete with fitted wooden carrying case.

**F-335 ..... Net \$19.95**  
(Add 88¢ for postage and handling)



All Equipment Protected by 10-Day Guarantee & 90-Day Warranty

## WHICH GROUP ARE YOU IN?



GENIAC® in Assembly Rack

THOUSANDS OF PEOPLE FROM THESE GROUPS HAVE BOUGHT AND ENJOYED GENIAC®, THE ELECTRIC BRAIN CONSTRUCTION KIT.

THE MANUALS are a survey of the applications of symbolic logic in reducing various problems to repetitive machine solution. We explain and illustrate with complete wiring diagrams. THE 100 PAGE TEXT gives an overview of the whole computer field.

THE KIT OF MATERIALS contains over 400 parts, switches, all wire and tools necessary for building and designing over 50 different computing game playing, problem solving circuits. YOU benefit from the experience of thousands of users incorporated in the latest manual. WE GUARANTEE ABSOLUTELY that unless you are completely satisfied with your GENIAC® kit, you may ship it back to us within 7 days and we will return your money.

**SEND NOW! ONLY \$19.95 POSTPAID**

- ENGINEER OR RESEARCH WORKER** who wants to learn more about the application of computers to his problems.
- TEACHER** who needs laboratory or demonstration material on computers.
- SCIENTIFIC AMATEUR** who wants to learn about computers but doesn't know how to begin.
- INVETERATE GADGETEER**
- STUDENT** impatient for teachers to begin.
- MAN** who wants fun with his kids.

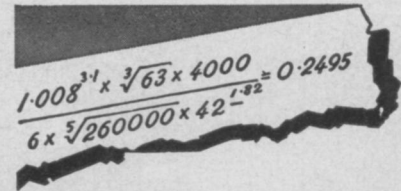
## COSMOTRON

- **MINIATURE ATOM SMASHER**
- **PRODUCES 75,000 VOLTS**
- **ABSOLUTELY SAFE**



In no sense of the word a toy or a gadget. The COSMOTRON is a scientific instrument capable of producing 75,000 volts—makes sparks up to 2" long—yet is absolutely safe because the current is infinitesimal. The science teacher—science lover—or hobbyist can perform experiments to astound students—friends—family. Makes smoke disappear—defy gravity—turns propellers at a distance—transforms atomic energy into light—makes artificial lightning—smashes atoms—demonstrates ionic space ship drive—and many other experiments. Constructed of the finest materials. Will do exactly—for instruction purposes—what generators that cost 3 to 10 times more will do. The perfect device to teach the secrets of atomic physics and electricity. Will hold an audience spellbound as it performs trick after amazing trick. Includes an experiment kit and illustrated experiment manual. Manual explains the "how" and "why." You will invent many new experiments of your own. A fine research tool that will give years of beneficial service to the institution or individual who owns one. In kit form or assembled.

**Kit Form ..... \$14.95**  
**Assembled ..... \$19.95**



**A 66-inch Slide-rule for your pocket, \$19.95**



Slide Rule Open

The GENIAC® Calculator carries 66-inch spiral scales yet measures only ten inches fully extended and six inches when closed. Four to five figure accuracy can be relied on. It is indispensable to the scientist, research worker and student. Administrative staff and business men will find it of tremendous value for a host of estimating and checking calculations.

The GENIAC® Slide Rule solves multiplication, division, percentage calculation and gives 5 place logarithms.

You may use it for 30 days and if you are not satisfied repack and mail it back.

What our users say:

"It does all you claim — four or five figure accuracy without eyestrain or magnifiers. Half an hour's study is ample for its use."

A. E. B.

"I use the GENIAC Calculator for all my slide rule work and need the extra digit which normal slide rules cannot give. I had to get one of my customers a GENIAC Slide Rule last month, after using mine in his office." E. & G. H. Textile Manufacturers.



Slide Rule Closed

All Equipment Protected by 10-Day Return Guarantee & 90-Day Warranty

**OLIVER GARFIELD CO., Inc.** DEPT. SL-19-A, 108 East 16th St., New York 3, N. Y.

Please send me the following:

900X "Microbe Hunter" F338 @ \$39.95 (plus \$1.00 for postage & handling) ..... 50X "Stereoscope" F337 @ \$29.95 .....

30X "Stereoscope" F335 @ \$19.95 (Add 83¢ each) .....

GENIAC Slide Rule @ \$19.95 ..... COSMOTRON: Assembled @ \$19.95 ..... Kit Form \$14.95 .....

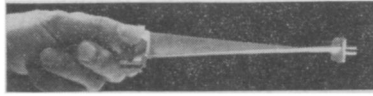
GENIAC Electric Brain Kit and Manual @ \$19.95 (East of Miss.) ..... \$20.95 (West of Miss.) ..... \$21.95 (Outside U.S.) .....

NAME ..... STREET ..... CITY ..... STATE .....

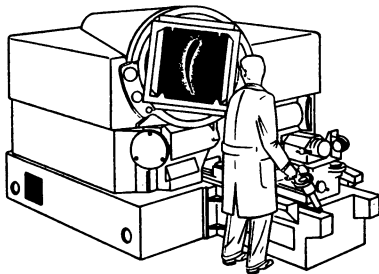
# Kodak reports on:

a large optical device . . . what happened on August 22, 1946 . . . tocopherol, three years and 1384 papers later

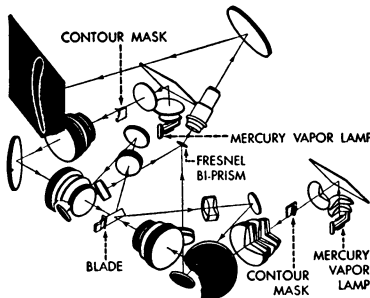
## For blades (also vanes and buckets)



This is a blade from a jet engine. Many mathematical minds, mighty mathematical machines, and much aerodynamical experimentation have created its shape. Violation of the plan to the extent of a few thousandths of an inch in a single cross-section of a single blade sucks at efficiency like a little leech. And there are so many blades in a single compressor or turbine that the total number of them made in the brief span of air-breathing non-reciprocating history must compare with all the wooden spokes in all the wagon wheels of all the supply trains in all armies since Alexander the Great. Tolerances on wooden spokes have always been broad.



Therefore we have been busy lately building this large optical device. It works as follows:



Not long ago the two mercury lamps were turned on and the first cross-section of the first blade was seen in magnification against its

tolerance envelope scribed on the screen. Inspection from now on should go well.

*The device has been named Kodak Section-Profile Projector. It is enough to restore faith in the future of geometrical optics. Inquiries go to Eastman Kodak Company, Special Products Sales, Rochester 4, N. Y.*

## Photoplast plates

Rohm & Haas and we are putting on a little promotion. They are the people who make optically clear methyl methacrylate sheets under the trademark "Plexiglas." We are the people who try to make the world's most dependable photographic emulsions under the trademark "Kodak."

The promotion draws attention to the result of coating one of our emulsions on their methacrylate to produce *Kodak Photoplast Plates*. The plates went officially on sale on August 22, 1946. You could have placed an order for them the next morning if you had known about them and wanted some. No special reason for delaying the promotion till now. The matter just hadn't struck us as urgent until Rohm & Haas phoned us about it the other day. Ever eager to see "Plexiglas" moving along the arteries of trade with or without photographic emulsion on it, R & H wanted to tell their field sales force about *Photoplast Plates*.

Then, even before we got around to deciding that this would be fine with us, came another phone call about *Photoplast Plates* from one of the smarter firms in the electronics business. Originally they had inquired about circular glass plates which would accept photographically a fine-detail pattern. Link by link, the chain of correspondence had led up to *Photoplast Plates*. They can resolve better than 200 lines per millimeter, machine beautifully in broad daylight after exposure and processing, are easy to cement with recommended solvents and are easy on the nerves of artisans and engineers afflicted with slippery fingers. The electronics executive on the phone was beside

himself with enthusiasm at the analog-to-digital code wheels he had fabricated with them. He was also popping with ideas for putting computer programs on them in optical form. Whether he was going to read the programs with multiple arrays of tiny *Kodak Ektron Detectors* he didn't say.

*Very well. We hereby advertise (and Rohm & Haas salesmen are free to disclose) that Kodak Photoplast Plates are for sale in any desired rectangular size from 4" x 5" to 20" x 24" and in thicknesses of 1/8", 1/4", and 3/8". Prices and technical details on application to Eastman Kodak Company, Special Sensitized Products Division, Rochester 4, N. Y.*

## The wordy vitamin

In the three years 1955 through 1957, there have appeared to our knowledge 119 papers in the world's scientific literature on the occurrence and distribution of vitamin E, 60 on the determination of vitamin E, 148 on its chemistry, 362 on its relation to physiology and pathology, 85 on its pharmacology, 275 on its role in nutrition and metabolism, and 335 on its medical and therapeutic uses. There has been an international congress on vitamin E in Venice, and the vitamin has been definitely related to the hatchability of turkey eggs, with weighty consequences for turkey economics.

Because we like to think of ourselves as a potent force in the investigation and commercial production of vitamin E, one or the other of us has, with varying degrees of belief, read every one of these papers. We have subsequently prepared an annotated bibliography of them for distribution by the National Vitamin Foundation, 149 East 78th Street, New York 21, N. Y., the fourth such we have done. If you have use for a copy, you can state your case to the Foundation.

*Now that it is printed, we have at least one regret. On page 56 we see the word "preventative." Rhetoricians deplore the word "preventative."*

**This is another advertisement where Eastman Kodak Company probes at random for mutual interests and occasionally a little revenue from those whose work has something to do with science**

**Kodak**  
TRADE MARK

# Special Tool Bargains—Save Up to 50%

**"Cordomatic" Automatic Retracting HANDY-LITE REEL**  
Pulls Out Any Length up to 20 Feet  
RETRACTS AUTOMATICALLY



The "Cordomatic" Reel is the answer to the right light, where you want it—when you want it, in Home, Garage, Workshop, Patio, Basement, Service Station, Warehouse, Stock Room, Individual Plants or wherever a dependable and mobile light is required. Features easy-to-grip Neoprene handle with heavy duty steel reflector plus added outlet in handle. Swing-open guard permits instant bulb change; reinforced hanger hook. Fool-proof gravity locking action has nothing to break or jam. Operates exactly like a window shade—locks and releases with finger-tip control at any desired length. Heavy-duty spring motor is dust-proof and lifetime lubricated. Comes complete with 20 feet of UL Approved SV Neoprene cord featuring a kink-proof, molded-in-cure jacket which is oil and water resistant and equipped with an adjustable Neoprene stop ball. Can be mounted to provide 180 degree free swivel or can be hung from ceiling to provide full 360 degree rotation.

**\$8.95** ppd.



**"Cordomatic" Multiple Outlet Reel**

Same as above except that in place of "trouble light" you have a 3-Outlet Plug which serves as a Portable Automatic Appliance Center—handy whenever and wherever you need it!

**\$7.95** ppd.

**"Cordomatic" Automatic Retracting CLOTHESLINE REEL**  
for Indoors and outdoors!



Completely eliminates the tangles, knots and troubles some hand winding of old-fashioned clothesline rope or twine—ends clothesline clutter forever. With the Cordomatic you use only the amount of line you need, when you need it! White, washable plastic, guaranteed to hold up to 300 lbs., is kept taut even under heaviest wash by the unique locking-ring. Self-storing line retracts automatically after each use—out of sight—completely shielded from dust and grime. It's easily removed for use indoors and outdoors. Smartly styled in gleaming chrome and weather-resistant aluminum. Has 180 degree free swivel.

20 Foot Line **\$3.95** ppd.  
40 Foot Line **\$6.95** ppd.

All "Cordomatic" Products Unconditionally Guaranteed Against Defective Workmanship and Materials.

Prevents Window Entry!  
Warns Against Fires!

**Combination BURGLAR and FIRE ALARM**

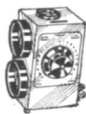
Foolproof Protection for Every Window in Home or Office!



Now, in one compact, foolproof, (2 for \$7 inexpensive, ppd.) battery operated unit, you have one of the most ingenious alarms ever developed! Should a burglar try to enter your home or office, the slightest disturbance of window, window shade, venetian blind or door automatically sets off a loud, howling siren that can be heard blocks away. AND, this same alarm acts as a fire detector. As soon as room temperature hits 135 degrees this same alarm thermostatically controlled, "goes off!" The real beauty of this unit is that it will last a lifetime because there is absolutely nothing to go out of order. Works on a single flashlight battery. Anyone can install it in seconds—anywhere! A single alarm can protect one or several windows and doors. Play safe—buy several!

**\$3.95** ppd.

Now, in one compact, foolproof, (2 for \$7 inexpensive, ppd.) battery operated unit, you have one of the most ingenious alarms ever developed! Should a burglar try to enter your home or office, the slightest disturbance of window, window shade, venetian blind or door automatically sets off a loud, howling siren that can be heard blocks away. AND, this same alarm acts as a fire detector. As soon as room temperature hits 135 degrees this same alarm thermostatically controlled, "goes off!" The real beauty of this unit is that it will last a lifetime because there is absolutely nothing to go out of order. Works on a single flashlight battery. Anyone can install it in seconds—anywhere! A single alarm can protect one or several windows and doors. Play safe—buy several!



**"Happy" Split-Image Transit—Revolutionary LEVEL & INCLINE MEASURE**

This amazingly accurate instrument indicates level and measures incline down to a fraction of an inch. Makes bubble type or string levels obsolete. It not only indicates level, but shows exactly how much correction is needed. Just one person, using

the split-image transit and target supplied with it, can perform any levelling, incline-measuring job quickly, easily, accurately. — measures inclines down to the thinness of a dime at 25 feet.

**\$6.95** ppd.

IDEAL FOR:  
Leveling & Grading Model  
Train Tables  
Contour Plowing  
Carpentry  
Brick Laying  
Cement Work

Surveying  
Guttering  
Foundation Work  
Yard Grading  
Plumbing  
Duct Installation  
Shriving  
Irrigation

**New Protection Against Winter Freeze-ups  
KEEP FROST, SNOW, ICE AWAY FROM**

- Water Pipes
- eaves
- gardens
- sidewalks
- gutters
- downspouts
- driveways

**Easy Heat CABLE KIT**

- CHASES ICE from gutters, eaves, downspouts
- MELTS SNOW from driveways, sidewalks... ELECTRICALLY!

No more ice-jammed gutters, OR BACK BREAKING SNOW SHOVELING! Melt ice, snow electrically—from eaves, gutters, downspouts, steps—and on driveways, sidewalks as it falls! Or place on surface of snow, ice that's already fallen, see snow melt away in minutes! For built-in protection when laying new sidewalks, driveways—place cables underneath concrete or asphalt. Other uses: keeps engine warm in unheated garage. Floor heating in kennels, soil heating in gardens. Prevents trailer plumbing, water in animal troughs from freezing. Kit contains looped strand of extra heavy vinyl covered heater wire, UL approved lead wire and moulded plug, instructions.

3 ft.-----\$ .95	24 ft.-----\$3.65
6 ft.-----\$1.70	30 ft.-----\$5.60
12 ft.-----\$2.50	40 ft.-----\$6.85
18 ft.-----\$2.75	60 ft.-----\$8.95

**Easy Heat HEAT TAPE**

Protects WATER PIPES above or below ground AGAINST FREEZEUPS!



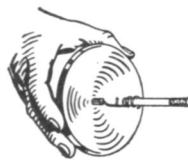
Easy Heat Heat Tape acts like an "electric blanket" to keep water pipes warm, safe from freezing, bursting! Pipes stay warm all over, because heat's distributed evenly along entire length of pipe. Installs in minutes, protects pipes all winter! Twin insulated heat cables run entire length of tape, end in lead wire and plug. Just wrap tape around pipe, cover with heavy-duty outer covering, fasten with gummed vinyl tape. That's all! Then just plug in lead wire to any AC-DC outlet on days when temp. nears freezing. Unplug on warmer days! Also protects house trailer plumbing, water pumps, etc! You get: heat tape with twin attached cables, waterproof, vermin-proof insulating wrap, gummed vinyl tape, instructions. With Built-in Thermostat

3 ft.-----\$2.25	3 ft.-----\$4.75
6 ft.-----\$2.95	6 ft.-----\$5.45
12 ft.-----\$3.95	12 ft.-----\$6.45
18 ft.-----\$4.95	18 ft.-----\$7.45
24 ft.-----\$5.75	24 ft.-----\$8.45

**Windproof, Waterproof, Flameless, Fuel-Less Pocket Size**

**SOLAR CIGARETTE LIGHTER**

Lights Every Cigarette Under the Sun—Wind can't blow it out.



The most practical outdoor cigarette lighter ever created! A precision instrument that utilizes the power of the sun to light your cigarette. Forget about fuels, matches, wicks, danger of fire. Merely insert a cigarette in scientifically designed parabolic pocket-sized reflector and in just a few seconds your cigarette is lit. NO PUFFING IS REQUIRED! Perfect for all

outdoors—camping, fishing, beach and boats. Guaranteed to amaze and amuse you—and your friends! Also works thru sunny windows indoors. **\$1.00** ppd. (3 for \$2.75)

**Automatic Siphon Pump**

sensational low price **\$1.98** ppd.

Now—siphon any liquid automatically, safely, WITHOUT putting tube to mouth! Squeeze bulb, liquid starts to flow immediately! Transparent sections let you see liquid flowing! Siphons, pumps gasoline, water, any liquid. Even acids, corrosives! For cars, boats, power mowers, campers, plumbers, doctors, chemists, factories! Acid resistant. Over 7 ft. long!

ALSO AVAILABLE—Heavy Duty Siphon—1/2" dia. tubing, 8 ft. long -----\$2.98 pp.

**Drills and Saws Any Shape! Supreme HOLE SAW**

Simply insert the amazing Drillsaw into the chuck of your 1/4" electric drill and you're ready to cut any shape you desire. Lower portion of Drillsaw acts as regular 1/4" drill which easily bores thru wood, plaster, plastics, plywood and similar materials. Then, after penetration, the keen cutting edges of the Drillsaw, cleanly and speedily cut in any direction you move. Cut circles, triangles, zig-zags, any conceivable shape you wish—in seconds!

**\$1.00** ppd.

**Now! Shut Out Cold, Wind, Water, Snow . . . Keep Garage Warm and Dry ALL WINTER with . . . FLEXIBLE RUBBER GARAGE DOOR BOTTOM**



Don't waste precious heating dollars! Keep winter cold, snow, rain, dust and drafts out—keep heat in with this amazing heavy-duty, live rubber weather-stripping. Ingenious front and back lip contour design makes it an automatically perfect closure regardless of shape of floor. Guaranteed never to harden, rot or deteriorate in any fashion. Eliminates forever ear-shattering noises no matter how hard you slam down your overhead garage door. Ideal also for sides of double hung garage doors, barn doors, etc. Can be permanently applied in only 10 minutes—requiring just a hammer—we supply the nails. Complete, simple instructions in plating pack. 9 foot strip-----\$2.89 ppd. 16 foot strip-----\$4.98 ppd.

Water ON or OFF at

**SAME TEMPERATURE — SAME PRESSURE**

with Elgin

**SHOWER ECONOMIZER**

Saves Water, Fuel, Money!



Set your shower to temperature and pressure desired—then shut it off by a slight tug of the "Economizer" chain. After you're all soaped up, another gentle tug of the chain restores the EXACT same temperature and pressure as before! Fits all showers, screws on in a minute. Made of solid brass—heavy chrome plated. Unconditionally guaranteed for 2 years—precision made to last a lifetime! Perfect for homes, resorts, schools, hotels, motels, apartment houses, institutions, trailers **\$3.95**

plus 35¢ pp. & hdg.

3 for \$10.85—

plus 50¢ pp. & hdg.)

**IMPORTANT**

Guarantee. Protects you against risk.

**SCOTT-MITCHELL HOUSE, Inc.**

Dept. 2401—415 South Broadway, Yonkers, N. Y.

# How to save 77 years



The boy Galileo sat in the sanctuary of Pisa's great cathedral, observing the movement of a lamp which had been set swinging by a sudden gusty draft. The chain by which it was suspended from the high ceiling was of such a length that the arcs decreased but slowly. Strange thing, though. No matter how far the pendulum swung, its movement consumed the same time. Galileo made a note of that. The year was 1581.

The old man sat at his writing desk, sixty years and a thousand disputes later, writing down a new theory. The regularity of a swinging pendulum might be combined with a spring mechanism to improve the unreliable clocks of that day. So Galileo scribbled on, and did nothing more about it. A number of years after his death Huygens took the notes and invented the pendulum clock. *Seventy-seven years had elapsed since the boy made the observation upon which it was based!*

The creative thinker today still need not have a specific use in mind when, by equation or formula, he branches off from the accepted to the hitherto unknown. The classic invention of this decade, the transistor, evolved in the Bell Telephone Laboratories as scientists sought a deeper understanding of semiconductors. On the other hand, another great invention, the feedback amplifier, came from the acutely creative mind of one Bell engineer faced with a specific problem.

Current Bell Laboratories activities—in such areas as data transmission, radar and submarine cable development—call for the coordinated efforts of all types of thinkers and all types of approaches. One type complements another.

Today, seventy-seven years would not have elapsed between the swinging lamp and the swinging clock pendulum—certainly not at Bell Labs, where ideas, though not rushed, are carefully advanced toward fruitful application in national defense, industry and communications. An important part of this harvest is the efficiency of America's telephone service, unequalled anywhere else in the world.

**BELL TELEPHONE LABORATORIES**

WORLD CENTER OF COMMUNICATIONS RESEARCH AND DEVELOPMENT

