



The Weekly Newsmagazine of Science

Science Service Publication Volume 146, No. 16, October 15, 1994

Alfred Scott McLaren Publisher Patrick Young Blair Burns Potter

Editor Managing Editor

Dan Skripkar Production/Design Director Greg W. Pearson Associate Editor

Senior Editor Environment/Policy Janet Raloff Ron Cowen Astronomy

Bruce Bower Behavioral Sciences Chemistry/ Materials Science Richard Lipkin

Richard Monastersky Tina Adler

Earth Sciences General Science Kathy A. Fackelmann, Elizabeth Pennisi Life Sciences Biomedicine Ivars Peterson Mathematics/Physics Editorial Assistant Larry Norland

Adrienne C. Brooks Science Writer Intern Cait Anthony Books/Resource Manager Donald R. Harless Advertising/Business

Manager

SCIENCE NEWS (ISSN 0036-8423) is published weekly on Saturday, except the last week in December, for \$44.50 for 1 year or \$78.00 for 2 years (foreign postage \$6.00 additional per year) by Science Service, Inc., 1719 N Street, N.W., Washington, D.C. 20036. Second-class postage paid at Washington, D.C., and additional mailing office. POSTMASTER: Send address changes to SCIENCE NEWS, P.O. Box 1925, Marion, Ohio 43305. Change of address: Four to six weeks' notice is required — old and new addresses, including zip codes, must be provided.

Copyright © 1994 by Science Service, Inc. Title registered as trademark U.S. and Canadian Patent Offices. Printed in U.S.A. on recycled paper.

Editorial and Business Offices:

1719 N St. N.W., Washington, D.C. 20036 (202-785-2255) Republication of any portion of SCIENCE NEWS without

written permission of the publisher is prohibited. Subscription Department: P.O. Box 1925, Marion, Ohio 43305 For new subscriptions only, call 1-800-247-2160. For customer service, call 1-800-347-6969. This Week

Mice, Flies Share Memory Molecule 244 244 Pacific Ocean quake stumps scientists 245 Out of Africa: Clues to dinosaur evolution 245 Storing holograms with a new polymer 246 Semen protects against preeclampsia 246 Natural mass limit for neutron-star pairs? Nobel for translator of cell messages 246 Making light of sound in solitary bubbles 247 Shuttle radar views erupting volcano 247

Research Notes

252 Science & Society 254 Earth Science 255 **Health Physics** 255 Environment

Articles

248 Universe in a Drop 250 Abandoning Richter

> Cover: Model of the first known earthquake-sensing device, created by Chinese scholar Chang Heng around A.D. 130. An unknown internal chinese scholar chang Heng around A.D. 130. An unknown internal mechanism would indicate the direction of an earthquake by causing a ball to fall out of a specific dragon's mouth. Seismologists today have more elaborate machines to detect earthquakes, but their methods often seem just as mysterious to the public. (Photo: U.S. Geological Survey, Dept. of Interior)



Departments

242 Books

Science Service, which publishes SCIENCE NEWS, is a nonprofit corporation founded in 1921. It gratefully accepts tax-deductible contributions and bequests to assist its efforts to increase the public understanding of science, with special emphasis on young people. More recently, it has included in its mission increasing scientific literacy among members of underrepresented groups. Through its Youth Programs it administers the International Science and Engineering Fair, the Science Talent Search for the Westinghouse Science Scholarships, and publishes and distributes the *Directory of Student* Science Training Programs for Precollege Students.

Board of Trustees — Chairman, Glenn T. Seaborg; Vice Chairman, Gerald F. Tape; Secretary, David A. Goslin; Treasurer, Willis Harlow Shapley; Joseph W. Berg Jr.; Robert W. Fri; J. David Hann; Dudley Herschbach; Shirley M. Malcom; Elena O. Nightingale; Ben Patrusky; Peter H. Raven; H. Guyford Stever; Sanford J. Ungar; Deborah P. Wolfe. Honorary Trustees — Edward Bliss Jr.; Bowen C. Dees; O.W. Riegel; John Troan. President: Alfred Scott McLaren; Vice President and Business Manager: Donald R. Harless.

Publication Title			2	Public	abo	n No.		_	3.	Filing Date
Science News	0	0	3	6	-1	8	T	2	,	9/30/94
saus Frequency	5. N	to, of	sque				-1	2 .		Annual Subscription Price
weekly		Annual 53	Ŋ						1.	*** **
Complete Mailing Address of Known Office of Publication (Street, City,			wi 711	240.0		Dring			1.	344.50
1719 N Street, NW Washington, D.C. 20036-2888							,			
Complete Melling Address of Heedquariers of General Business Office Science Service 1719 N Street, NW, Washington, D.C.										
Full Names and Complete Making Addresses of Publisher, Editor, and	Menaging I	Editor	(Do A	of Le	8140	Blank	0			
Sisher (Name and Complete Making Address)										
Dr. Alfred Scott McLaren Science News, 1719 N Street, NW, Wa	ashing	ton	, [.c.	. :	00	36-	286	38	
for (Name and Complete Making Address)						_				
Rodney L. Young, Jr. Science News, 1719 N Street, NW, Wa	ashing	ton	, E	.c.	. 2	00	36-	288	38	
Illair Burns Potter Science News, 1719 N Street, NW, Wa Owner (if owned by a composion, its name and address must be sta or holding 1 sectors or more of the total amount of aboth. If not owner owned by a partnership or other unincorporated film, its name and as by a nomprofit organization, its name and address must be stated, (if a total control of the contr	ated and ale ad by a corp address as w	o imm oration	ections to the	ny the	ree:	her th	e nar	nes ar	nd ad	dividual owners must be or
Full Name	CO MOI LINE	-			-	Corr	niete	Melli	ing A	ddress
Science Service, Inc.		171			_				-	
		111	2 N	30		et		-		
a non-profit corporation	-+'	Was	hin	gtc	n,	D	.с.	20	03	6-2888
			_		_					
Known Bondholders, Mortgagees, and Other Security Holders Ownin	ng or Holdin	ıg 1 Pı	ercent	or Mo	ore o	ni Tota	M Am	ount o	of Bor	nds, Mortgages, or Other
Securities. If none, check hare. None		_				Con	niete	Maili	ing A	ddrees
Full Name					_					
Full Name None										

2. For	completion by nonprofit organizations authorized to mail at special rates, tus for federal income tax purposes: (Check one) 90 Has Not Chan	The purpose, function, and nonprofit sta- ged During Preceding 12 Months	tus of this organization and the exempt	
-	☐ Has Channed	During Preceding 12 Months		
		iblisher must submit explanation of chan		
	cication Name	14. Issue Date for Circulation Data Bek September 24, 1994		
15.		Average No. Copies Each Issue	Actual No. Copies of Single Issue	
	Extent and Nature of Circulation	During Preceding 12 Months	Published Nearest to Filing Date	
a. Total	No. Copies (Net Press Run)	247,765	239,788	
(1) S	and/or Requested Circulation lates Through Dealers and Carriers, Street Vendors, and Counter Sales (Not Mailed)	D	0	
(2) P	hald or Requested Meil Subscriptions Include Advertisers' Proof Copies/Exchange Copies)	244,286	235,745	
: Total	Paid and/or Requested Circulation m of 15b(1) and 15b(2))	244,286	235,745	
d. Free (San	Distribution by Mail policy (Complete, Complementary, and Other Free)	1,788	, 1,770	
e. Free	Distribution Outside the Mail (Carriers or Other Means)	0	0	
. Total	Free Distribution (Sum of 15d and 15e)	1,788	1,770	
g. Total	Distribution (Sum of 15c and 16f)	246,074	237,515	
	nes Not Distributed Office Use, Lettovers, Spoiled	1,673	2,273	
(2) 1	Return from News Agents	0	0	
. Total	(Sum of 15g, 15h(1), and 15h(2))	247,747	239,788	
Percent (15c/:	It Paid and/or Requested Circulation 15g x 100)	99%	99%	
16. TN	s Statement of Ownership will be printed in the 10/15/94	isue of this publication. ☐ Check both	x if not required to publish.	
17. Sig	nature and Title of Editor, Publisher, Business Manager, or Owner		Date	
.r	nath & Halen		0/1/94	

OCTOBER 15, 1994 243

Edmund Scientific Co. makes 'Best-Sellers' **Make Perfect Christmas Gifts** Metric Triple Balance Ohaus Scale Triple Balance Ohaus Scale With Single Pan Balance. With Single Pan Balance. The classic weighing instrument provides The classic weighing covery book/kit features over 100 pages of activities bound right into

Digital Thermometer Shows BOTH Indoor AND Outdoor Temperature, Memory Fo Memory For The Day's High AND Low!

Now you'll know at a glance how cold it is, with large, easy-to-read [LE] readout numbers, both the outside and inside temperature. Thermometer also records high and low readings. For C' selectable 40°F to +122°F. Modern Hi-Tech case measures 72°V-42°F.

Easy to mount. Uses 2 "AA" batteries (not incl.). Complete built 10 ft. outdoor probe sensor cord. Reg. \$46 SA38.038 on sale \$30

Have You Ever Seen The Inside Of Your Eye?



Eyescope is an optical device I looking at the inside of your ey it's a specially designed diffus incorporating a parabolic mirr and lens light. Safe and easy use. A booklet include describes the various features i

Bring The World 8 Times Closer With This Pocket-Size, Economical 8x20 Monocular.

Hotel-Size, Econominical oxec monitorial.

Ideal for bird watchers,
hunters, racing and sports
fans. You'll never miss out on that rare bird sighting.

The big play... or the photo
finish again. This compact have not of prism design monocular features all optical grade glass optics and a water resistant rubber coated body. Includes soft case an exek stran.

Can You Tell Which Ball Is A Happy Bouncer, And Which Ball Is Not?

And writich ball is NUL?

Two seemingly identical black spheres with
marked differences in their physical properties. Balls are 3/4" in diameter and have the
same density, mass, color and appearance,
yet when dropped to the floor one jumps
widdy, the other is motionless. Marvelous
thought provider for discrepant event science. Fact sheet on physical and chemical

ties plus experiments for classroom sluded. SA39,129 \$3.95/Pair; 10 Pairs or more \$3.50 Illuminating 30X Magnifier-Microscope For Examining Stamps, Coins, etc.



Examining Stamps, Colins, etc.

Our new design improves this popular model. Carry it with you everywhere, measures only 5 ½ × 1½ × ½ ½ deaf for critical inspections. Has a built-in light source and optics to let you examine objects 30 times actual size. Features a center focus wheel for precise one-hand operation. Ideal for industrial inspections and hobby applications. Uses 2 *AA* batteries (not incl.). \$A35,001 \$9.50

Add Spectacular Color To Your Home With A

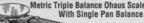
Rainbow Light Display.

your windowsill and projects the ever-changing rainbow patterns over your walls, ceiling and floor. It's almost like being inside a multifaceted diamond. Glass equilateral prism is 2" (50mm) long with "(25mm) face. Black plastic mount is 3" x1%" x1%". \$A38,400 \$7.95

Radiometer... A Space Age Sphere.

Tips Of Blow Darts Were Coated With Poison

Found In The Skin Of These
Rain FROGS
Forest FROGS
Designed in cooperation with the National Aquarium in Battimore, MD. Each colorlylly bandquisted from is 2½ long. The toxic poison colorlylly bandquisted from is 2½ long. The toxic poison Baltimore, MD. Each orfully handpainted frog is 21/1" long. The toxic pois of in the skin of these frogs has been used for centur Indians who use it to coat the tips of their blowgun da



250 Assorted Stars That Glow In The Dark Turn

Any Wall Or Ceiling Into The Night Sky.

Assortment of 250 luminous stars that glow in the dark on ceiling or wall. You and your friends will enjoy viewing these stars. They'll light up a room with the beauty of glowing stars and you'll have fun with astronomy. Easy to apply decals glow after exposure to light. Comes with star chart and instructions to recreate the big dipper, Milky Way and the heavens.

ASSO21 Package of 250 \$4.50

Miniature Water Pump For Photo Darkrooms, Science Fairs, Water Displays.



Moon-Blob, It Crawls Out Of Containers
And Looks Alive As It Creeps Uphill.

Moon-Blob has unbelievable properties and is fun to play with....It acts alive and looks like a living protopiasm as it defies gravity by crawling up and out of its container. It's dehydrated plastic — just add water to activate it. Completely harmless. Dual pack. 2 Packages, \$A38,440 \$10.95

Deal An Optical Illusion Next Time You Play Poker, Blackjack or Gin Rummy.

Deck A: Can You Believe Your Eyes SA39,635 \$7.95 Deck B: More Illusions & Visual Oddities SA39,636 \$7.95

Space Wheel®, The Talk Of The Galaxy. Could It Be Perpetual Motion?

Have alot of fun



Medical Tweezers For Fine Detail Work.



Superior precision, surgical quality pair of tweezers are hand crafted out of 100% stainless steel. Ideal for removing splin-ters, ingrown hairs; will tweeze the finest hair, 4 ½ x 3 kg. Opens to 3/s". SA31,345 \$11.50

Build Your Own Motorized Walking Robot

A Capsela discovery toy can be an exciting introduction to robot technology and engineering. You'l be able to build a slow-motion robot and, at your command, watch if move forward or backward in perfect calibrated balance. If almost becomes affiver! Contains complete instruc-Flash Rocks.

Strike them together and see amazing flashes inside the rocks! The source of light is a miniature "lightning flash" and, at your command, watch it move forward or backward in perfect calibrate occurs in the quartz material within the rocks. It's nature's Piezo effect. Package of 3 bags (6 rocks) SA37, 474 \$8.75 tions and 38 interlocking parts. SA39,856 \$29.95





Go Fishing With This Mighty Magnet.

America's largest mail order marketplace of unusual values in telescopes, microscopes, optics, magnets, solar cells, fiber optics, science discovery kits, weather instances. science discovery kits, weather instruments, prisms, astronomy and 'hard-to-find' products for hobbyists, students and educators.



for friendly special treatment

Use Visa, MasterCard, Diners Club, Am. Exp., Discover, Carle Blanche or Optima. Call anytime, 24 hours a day. MOST ORDERS SHIPPED WITHIN 48 HOURS

No Risk Guarantee! If you are not completely satisfied with your purchase, return the merchandise in its original package and we will cheerfully refund your money in full. We back our products!

Our 45 day unconditional guarantee means you take no risk on any product you buy from use



EXPIDITATORIUM SCIENCE CENTER
A 'hands-on' interactive science discovery book/kit features over 100
pages of activities bound right nite
his beautifully printed spiral book.
Mix up agar for a bacteria study,
read a cartoon through a fresnel
lens, study optics with a plastic lens
and a foll mirror, and design your
own optical illusion with a moiré

"The best present a child could receive." Robert Edmund. SA4766 \$17.95

Why Does This Amazing Space Pet or Celt Always Spin In A Counter Clockwise Direction?



in axis of the stone. Angular momentum is con-, but it doesn't look it. Made of injection molded Size: 31/4" x 31/4" x 71/4". Package of 3 SA38,912 \$5.95



NEW! PRICE NEW! PRICE \$4995

Lightweight, Measures Less Than 5.5" Ideal for lecturers, presentations, educators, instructors, annual meetings and slide shows.

SA52,442 PRICE BREAKTHROUGH! ONLY \$49.95

Every Detail Of Your Eye Enlarged.

Every Detail If Your Eye Enlarge Check contact lenses and inspect your own eye with our unique close-up eye inspection mirror. Our precision radius mirror with front surface coating allows you to inspect your own eye by simply holding the mirror approximately 2° in front of your eye. Ideal for contact lenspect for irritant alien particles. Mirror i with front surface aluminized coating.







Lift up to 200 lbs. Fun to use around docks and bridges. A "must" for a boat, it helps retrieve metal objects that fall overboard, You'il be amazed at what you pull up. Wt. 2 lbs., measures 4 x 3 / x 3 / x 3 / x Made with a Poly-Vinyl Chloride coating to resist corresion and chipping. \$A71,138 \$24,95



How High

Whether you're driving cross country or hiking in the mountains, this Altimeter will tell you how high you are. Shows elevation from sea level to 15,000 ft. Make Your



Create Fountain.

SA39,997 \$3,95



SA52.380

SPECIAL \$1995

Amazing Flying Bird Whirling Gyroscope

Sun Powered Radiometer PRICE

Rainbow Maker
 Space Pet • Fickle Foam



ocket built you of impending er to warn you of impending forms. SA34,544 \$39.95 Exciting Books For Science Fair Projects '700 Science Experiments For Everyone



New, up-to-date edition of the best known science experiment book in the world. Compiled by science instructors under the auspices of UNESCO in Paris. 251 pages, featuring optical projection, electricity, chemistry, astronomy, magnetism, geology, physiology and more. Describes experiments with easy-to-follow instructions and diagrams. S49301 \$13.95

"333 Science Tricks And Experiments



Science students will find ideas for pro-jects involving basic scientific principles in cluding inertia, gravity, magnetism and the mysteries of chemistry in this wall illustrated book. 208 pages, by Robert Brown - uses inexpensive materials with sup-ply-step instructions. SA9703 59.95

Fun And Intriguing! You'll Play For Hours With

Fun And Intriguing! You'll Play For Hours
These Colorful Magnetic Magic Marbles.
Build a mountain or odd geometric
patterns with these fascinating, high
impact plastic marbles. Each
marble has both a negative and
positive pole. A challenge to
your imagination. Fun for
youngsters, adults too!
20 marbles per package.

SA34,968 (Package of 20) @ \$3.95 Ea. (5 Packages or more) @ \$3.70 Ea. (10 Packages or more) @ \$3.20 Ea.



Our new, revised 120 page full color edition contains over 4,000 products. A fascinating source book for young scientists searching for creative ideas that can be adapted for science fair projects.

24	ne anahit	ou IU	SCIOIL	ic ruii	hinleria		
5	WRITE	OR	CALL	FOR	YOUR	COPY	TODAY

OTOCK NO	lory	PRICE		
STOCK NO.	UIT.	PRICE		
-				
Total Price				
In NJ Add 6% S	ales Tax			
	To In NJ Add 6% Si	Total Price In NJ Add 6% Sales Tax TOTAL ENCLOSED		





54th Westinghouse Science Talent Search

\$205,000 in scholarships will be awarded to high school seniors in the 54th Westinghouse Science Talent Search for research projects in science, mathematics and engineering

One	\$40,000 scholarship	(\$10,000 per year for 4 years)
One	\$30,000 scholarship	(\$7,500 per year for 4 years)
One	\$20,000 scholarship	(\$5,000 per year for 4 years)
Three	\$15,000 scholarship	(\$3,750 per year for 4 years)
Four	\$10,000 scholarship	(\$2,500 per year for 4 years)
Thirty	\$ 1,000 scholarship	(payable upon matriculation)

Basic Requirements — Entrants must be high school seniors during the 1994-95 school year. Primary emphasis is placed on a written report of an independent research project in the physical sciences, behavioral and social sciences, engineering, mathematics, or biological sciences (excluding live vertebrate experimentation). The research project must be the work of a single individual. Group projects are not eligible. An Entry Form, designed to elicit evidence of creativity and interest in science, is also required, along with an official high school transcript, available standardized test scores, and statements and recommendations from teachers and/or supervising scientists.

Winners Selection — Three hundred semifinalists are selected from entries received (usually about 1,500) after careful evaluation by a team of 20 evaluators and judges specializing in a variety of scientific disciplines. Forty finalists are then selected from the semifinalists and invited to Washington, D.C. in March 1995, for final judging by a board of eight distinguished scientists.

The Rewards — Three hundred semifinalists benefit in the following ways: (1) recommendations to colleges and universities for admission and financial assistance, (2) certificates of achievement for students and teachers, (3) a sense of accomplishment and a measure of self-esteem that comes from finishing a difficult assignment. The 40 finalists, selected from the semifinalists, are also awarded a trip to Washington for the five-day, all-expense-paid Science Talent Institute for final judging and a chance to share \$205,000 in scholarships.

Sponsors — Since its inception in 1942, the Science Talent Search has been funded by Westinghouse Electric Corporation and administered by Science Service, a Washington-based nonprofit organization.

Deadline — December 1, 1994 Entries for the 54th Westinghouse Science Talent Search

(1994-95 school year)

Fortries must be received by 11:59 p.m. on Thur

Entries must be received by 11:59 p.m. on Thursday, December 1, 1994, at Science Service, 1719 N Street, NW Washington, DC 20036. If the judging process has not been completed, late entries will be accepted ONLY if (1) metered in a U.S. Post Office by November 24, 1994, or (2) sent by a carrier that guaranteed delivery in writing by the deadline. Entries may NOT be sent by telefax.

We strongly recommend early entries to avoid any disappointment or delivery delays. NOTE: The U.S. Postal Service's Registered or Certified Mail is for tracking purposes only, and is *NOT* the same as Express Mail, which delivers overnight. Priority mail DOES NOT GUARANTEE IN WRITING delivery in two days.

NOW AVAILABLE

SEEKING — and Finding —
SCIENCE TALENT
A 50-Year History of the
Westinghouse Science Talent Search

Author Tom K. Phares provides a comprehensive history of the Westinghouse Science Talent Search from its inception in 1942. Entertaining prose leads you from the meeting of the two founders of the STS at the World's Fair in 1939; to the accomplishments of past winners — five of whom went on to become Nobel Laureates; to the dedicated individuals behind the winners; through the arduous judging and evaluation process; to the educational opportunities that open up to STS finalists. Also included as appendices in this informative review is a list of the finalists' names from 1942 to 1990; lists of major honors received by former winners; and a list of the 32 high schools which have produced the most winners. (Published by Westinghouse Electric Corporation, 1990; paperback; 122pp.)

To obtain a copy, send \$3 (to cover postage and handling) to STS History, Science Service, 1719 N Street, NW, Washington, DC 20036.

WRITE OR CALL FOR MORE INFORMATION, OFFICIAL RULES AND ENTRY FORM

WESTINGHOUSE SCIENCE TALENT SEARCH, «O SCIENCE SERVICE, DEPT. STS, 1719 N STREET, NW, WASHINGTON, DC 20036 (TELEPHONE: 202/785-2255)