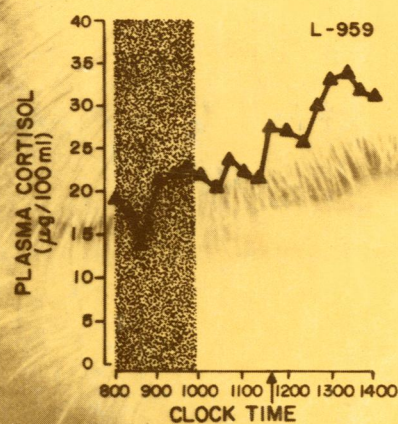
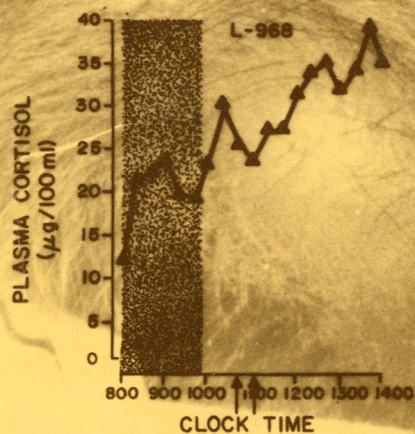
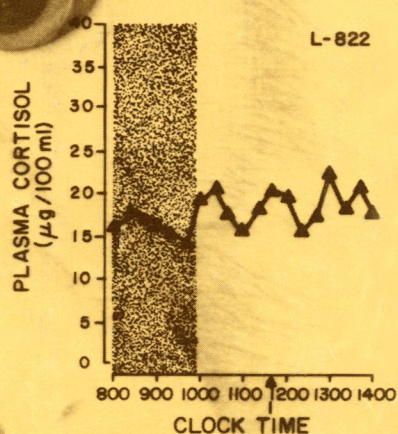
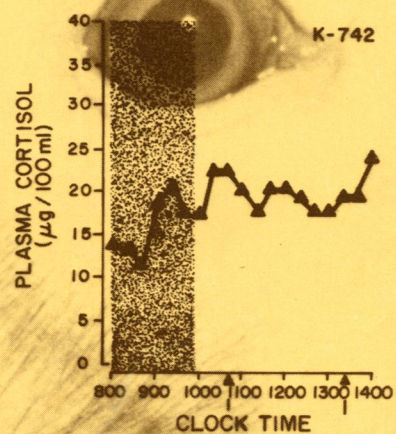
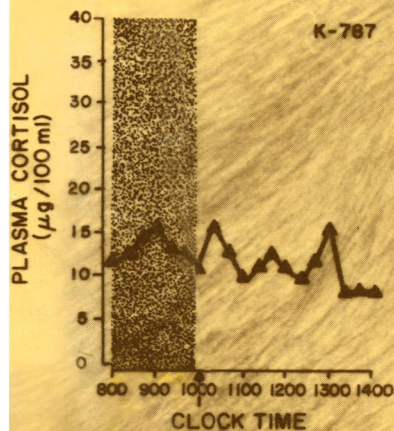
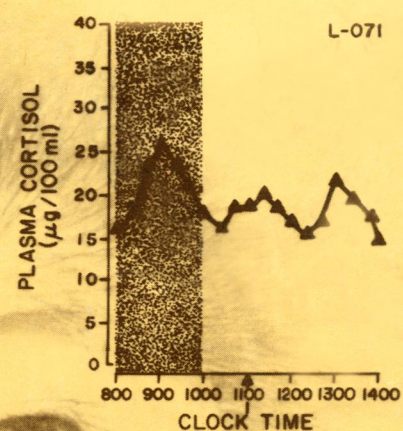
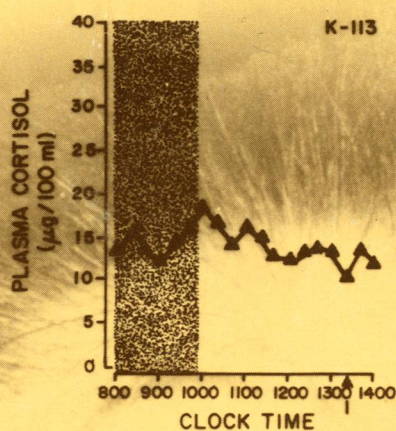
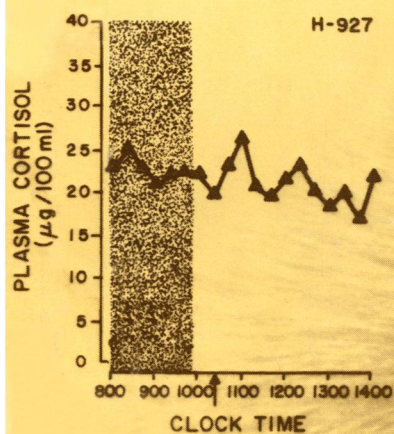
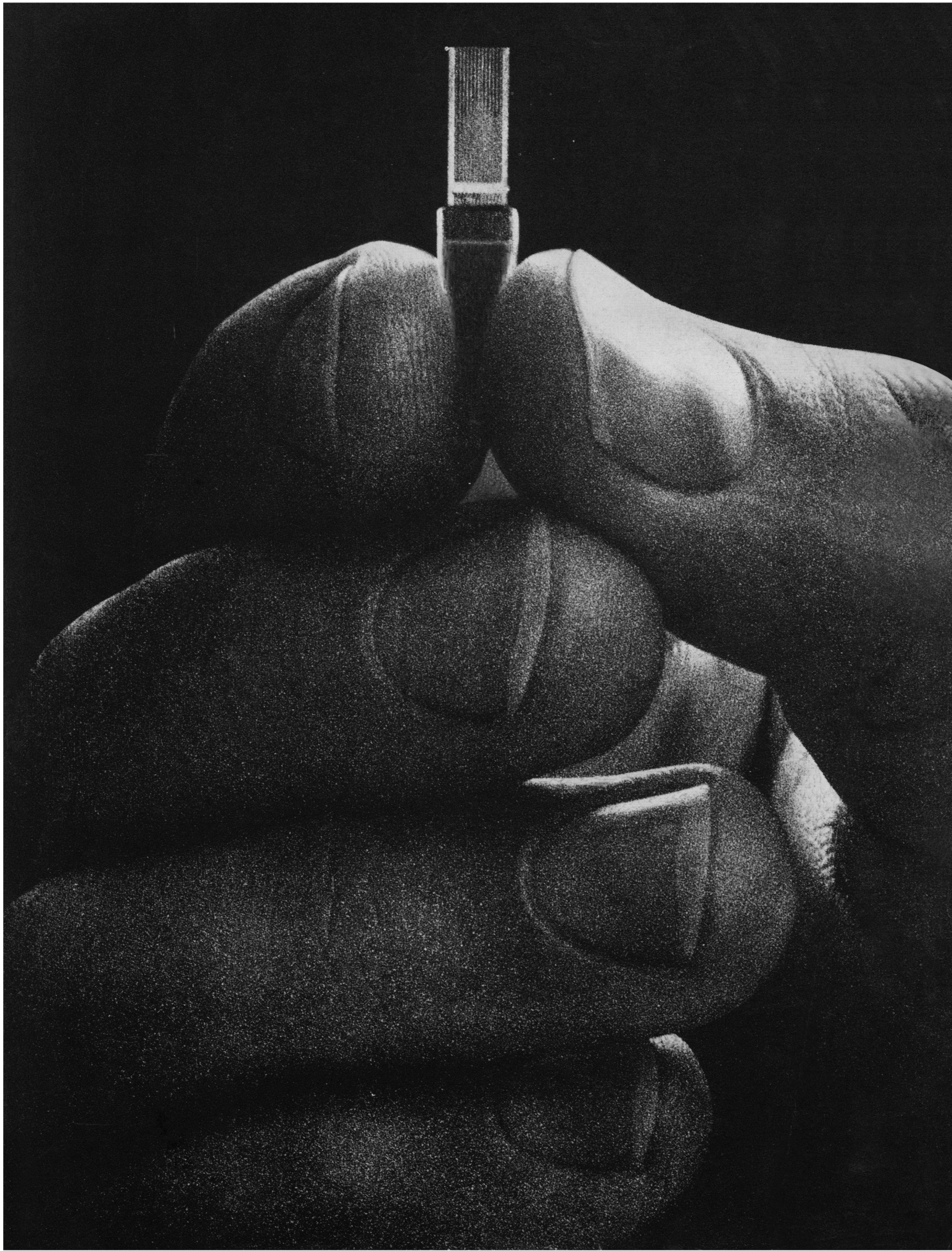


SCIENCE

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

7 October 1977, Volume 198, No. 4312





The Chicago Connection.

With it, the phone system of tomorrow
is in Chicago today.

A while ago, we told you light-wave communications was just around the corner. Today, it's in the streets of Chicago.

For the first time, the human voice, business data and even video signals are being carried by light-waves traveling over hair-thin glass fibers. Instead of electric current traveling over copper wire.

But without that little link you see on the opposite page, lightwave communications for such a wide range of services might still be an experiment in a lab. And without Western Electric technology, the link might still be a design on a blueprint.

The link is an outgrowth of an idea from the people at Bell Labs. While they were putting the major components of the lightwave system together, they had to find a way to splice the glass fibers and get the light across the splice.

A Simple Idea

The idea they came up with was deceptively simple. A coupling device made up of tiny grooved chips, smaller than the tip of your finger, that would guide the ends of the hair-thin fibers and butt them up

in perfect alignment.

There was only one hitch. Making one chip was easy. But there was no machinery that could mass produce all the identical chips that would be needed for a lightwave system like the one in Chicago.

Making Ideas Reality

That's where Western Electric comes in. Turning ideas into technological innovations is nothing new at Western Electric.

Over the years, Western Electric has piled up an impressive list of innovations that have become manufacturing standards.

It was the first company in the world to manufacture the transistor.

It was the first to put the laser to work as a useful production tool.

And it is the company that went beyond conventional machining techniques to make the chips for Chicago's lightwave system.

Each chip is pure silicon crystal. Its internal structure (a criss-cross arrangement of intersecting planes) provides a built-in blueprint for regularly spaced grooves. And because the crystal's diagonal planes etch faster than its per-

pendicular planes, uniform grooves can be chemically cut into the chip.

By combining the science of chemistry and the art of lithography, Western Electric's Engineering Research Center developed a way to etch 12 ultra-precise, perfectly shaped, identical V-grooves on each chip. With each groove no wider than a hair and separated only by a hair's breadth from its neighbors.

And, more importantly, they were able to reproduce these chips so that each one was a perfect double of the other.

Teamwork is the Key

The telecommunications revolution beginning in Chicago is another good example of how Western Electric and Bell Labs help put new technology into practical use for the Bell telephone companies, quickly and economically.

Their close relationship is an important reason why your telephone system is the most efficient and reliable communications system in the world. And it's a basic reason why innovations in technology are a common occurrence in the Bell System.



Western Electric

7 October 1977

Volume 198, No. 4312

SCIENCE

LETTERS	NBS: Problems and Needs: <i>F. K. Willenbrock</i> and <i>R. M. Davis</i> ; <i>M. N. Alexander</i> ; Computer Encryption: Key Size: <i>M. E. Hellman</i>	8
EDITORIAL	The Leadership of the Geological Survey	11
ARTICLES	Suid Evolution and Correlation of African Hominid Localities: <i>T. D. White</i> and <i>J. M. Harris</i>	13
	Raymond Lindeman and the Trophic-Dynamic Concept in Ecology: <i>R. E. Cook</i> . . .	22
	Impact of Federal Regulations at a University: <i>D. C. Priestersbach</i> and <i>W. J. Farrell</i>	27
NEWS AND COMMENT	Carl Rogers: Giving People Permission to Be Themselves	31
	The Empathic Computer	32
	Robert Thorne: Controversial Nominee for Energy R & D Job.	34
	Issue of Technology Transfer Is Snag for 1979 U.N. Meeting.	35
RESEARCH NEWS	The Zeeman Effect: A Unique Approach to Atomic Absorption	39
	Amaranth: A Comeback for the Food of the Aztecs?	40
	Bacterial Genetics: Action at a Distance on DNA.	41
AAAS NEWS	Nairobi Conferees Identify Desertification Indicators; 1978 AAAS Annual Meeting, 12-17 February, Washington, D.C.; AAAS Travelers; Women in Scientific Research Topic of AAAS Conference; \$185,000 in Grants for Project on Handicapped; Affiliate News; Marine Science Session Highlights Annual Interciencia Meeting	43

BOARD OF DIRECTORS

WILLIAM D. MC ELROY
Retiring President, Chairman

EMILIO Q. DADDARIO
President

EDWARD E. DAVID, JR.
President-Elect

MARTIN B. CUMMINGS
RUTH M. DAVIS

RENÉE C. FOX
BERNARD GIFFORD

CHAIRMAN AND SECRETARIES OF AAAS SECTIONS

MATHEMATICS (A)
Dorothy M. Stone
Truman A. Botts

PHYSICS (B)
Norman Ramsey
Rolf M. Sinclair

CHEMISTRY (C)
Norman Hackerman
Leo Schubert

ASTRONOMY (D)
Beverly T. Lynds
Arlow U. Landolt

PSYCHOLOGY (J)
Donald B. Lindsley
Edwin P. Hollander

SOCIAL AND ECONOMIC SCIENCES (K)
Matilda W. Riley
Daniel Rich

HISTORY AND PHILOSOPHY OF SCIENCE (L)
Ernan McMullin
George Basalla

ENGINEERING (M)
Ernst Weber
Paul H. Robbins

EDUCATION (Q)
Herbert A. Smith
James T. Robinson

DENTISTRY (R)
Harold M. Fullmer
Sholom Pearlman

PHARMACEUTICAL SCIENCES (S)
Stuart Eriksen
Raymond Jang

INFORMATION, COMPUTING, AND COMMUNICATION (T)
Lawrence P. Heilprin
Joseph Becker

DIVISIONS

ALASKA DIVISION

David M. Hickok
President

Keith B. Mather
Executive Secretary

PACIFIC DIVISION

Mildred Mathias
President

Alan E. Leviton
Secretary-Treasurer

SOUTHWESTERN AND ROCKY MOUNTAIN DIVISION

Erik K. Bonde
President

Max P. Dunford
Executive Officer

SCIENCE is published weekly, except the last week in December, but with an extra issue on the third Tuesday in September, by the American Association for the Advancement of Science, 1515 Massachusetts Ave., NW, Washington, D.C. 20005. Now combined with *The Scientific Monthly*. Second-class postage paid at Washington, D.C., and additional entry. Copyright © 1977 by the American Association for the Advancement of Science. Member rates on request. Annual subscriptions \$60; foreign postage: Canada \$10; other surface \$13; air-surface via Amsterdam \$30. Single copies \$2 (back issues \$3) except *Guide to Scientific Instruments* \$6. School year subscriptions: 9 months \$45; 10 months \$50. Provide 6 weeks' notice for change of address, giving new and old addresses and postal codes. Send a recent address label, including your 7-digit account number. Postmaster: Send Form 3579 to *Science*, 1515 Massachusetts Avenue, NW, Washington, D.C. 20005. *Science* is indexed in the *Reader's Guide to Periodical Literature*.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

BOOK REVIEWS	Anthropology and History in Yucatán, reviewed by <i>G. H. Gossen</i> ; Cell Wall Biochemistry Related to Specificity in Host-Plant Pathogen Interactions, <i>N. T. Keen</i> ; The Ecology of the Seas, <i>P. A. Larkin</i> ; Slow Virus Infections of the Central Nervous System, <i>W. J. Hadlow</i> ; Books Received	45
REPORTS	Two-Billion-Year Granulites in the Late Precambrian Metamorphic Basement Along the Southern Peruvian Coast: <i>B. Dalmayrac, J. R. Lancelot, A. Leyreloup</i>	49
	Cancer Mortality in U.S. Counties with Petroleum Industries: <i>W. J. Blot et al.</i>	51
	Bifunctional Intercalators: Relationship of Antitumor Activity of Diacridines to the Cell Membrane: <i>R. M. Fico, T. K. Chen, E. S. Canellakis</i>	53
	Synchronized Ultradian Cortisol Rhythms in Monkeys: Persistence During Corticotropin Infusion: <i>J. W. Holaday, H. M. Martinez, B. H. Natelson</i>	56
	Alpha Blocking: Absence in Visuobehavioral Deprivation: <i>J. D. Glass</i>	58
	Mental Set Alters Visibility of Moving Targets: <i>R. Sekuler and K. Ball</i>	60
	Striatal Efferent Fibers Play a Role in Maintaining Rotational Behavior in the Rat: <i>J. F. Marshall and U. Ungerstedt</i>	62
	Clockwise Growth of Neurites from Retinal Explants: <i>A. M. Heacock and B. W. Agranoff</i>	64
	Behavioral History as a Determinant of the Effects of <i>d</i> -Amphetamine on Punished Behavior: <i>J. E. Barrett</i>	67
	Neuronal Circadian Rhythm: Phase Shifting by a Protein Synthesis Inhibitor: <i>J. W. Jacklet</i>	69
	Selective Destruction of Neurons by a Transmitter Agonist: <i>R. M. Herndon and J. T. Coyle</i>	71
	Cortical Mechanisms That Augment or Reduce Evoked Potentials in Cats: <i>J. H. Lukas and J. Siegel</i>	73
	Imitation of Facial and Manual Gestures by Human Neonates: <i>A. N. Meltzoff and M. K. Moore</i>	75
	Transplantable Pancreatic Carcinoma of the Rat: <i>J. K. Reddy and M. S. Rao</i>	78
	<i>Technical Comments</i> : Hypertension and Nature of Stress: <i>M. Peters; R. Friedman and J. Iwai</i>	80

MIKE MC CORMACK FREDERICK MOSTELLER	CHAUNCEY STARR CHEN NING YANG	WILLIAM T. GOLDEN Treasurer	WILLIAM D. CAREY Executive Officer
GEOLOGY AND GEOGRAPHY (E) Howard R. Gould Ramon E. Bisque	BIOLOGICAL SCIENCES (G) Mary E. Clark Jane C. Kaltenbach	ANTHROPOLOGY (H) Raymond H. Thompson Philleo Nash	
MEDICAL SCIENCES (N) Robert W. Berliner Richard J. Johns	AGRICULTURE (O) John P. Mahlstede J. Lawrence Apple	INDUSTRIAL SCIENCE (P) Joseph H. Engel Robert L. Stern	
STATISTICS (U) John W. Pratt Ezra Glaser	ATMOSPHERIC AND HYDROSPHERIC SCIENCES (W) Robert G. Fleagle Stanley A. Changnon, Jr.	GENERAL (X) Mary Louise Robbins Joseph F. Coates	

The American Association for the Advancement of Science was founded in 1848 and incorporated in 1874. Its objects are to further the work of scientists, to facilitate cooperation among them, to improve the effectiveness of science in the promotion of human welfare, and to increase public understanding and appreciation of the importance and promise of the methods of science in human progress.

COVER

Individual cortisol patterns of eight chronically maintained adult rhesus monkeys; the fast-frequency ultradian rhythm is obvious to the eye. When time-series analysis was applied to these fluctuations, they were found to be synchronized among monkeys, to have a predominant periodicity of 85 to 90 minutes, and to be relatively independent of ACTH concentrations. See page 56. [Benjamin Natelson and Division of Medical Audio Visual Services, Walter Reed Army Institute of Research, Washington, D.C.].

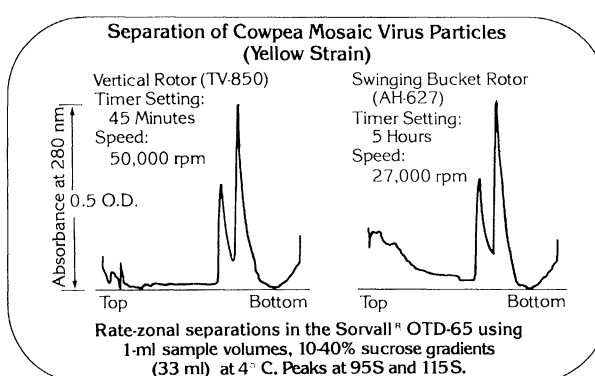
Density gradient spin times can Sorvall® OTD ultracentrifuges



High resolution and time savings result when the combined advantages of a Sorvall® OTD ultracentrifuge and a Sorvall® vertical rotor are used for density gradient separations.

These patented rotors* hold the tube in a fixed vertical position while tube contents are reoriented 90°. The sedimentation path length is thus reduced from the length to the width of the tube, resulting in shorter spin times. Three vertical rotors are available to suit a wide range of capacity requirements.

Typical results are shown in the rate zonal separation of cowpea mosaic virus particles using 1 ml samples. Use of a Sorvall® 8-place vertical rotor instead of a 6-place swinging bucket rotor of comparable tube volume reduced spin time more than 80% while maintaining resolution. These rotors are equally suitable for isopycnic density gradient separations.



Sorvall® OTD ultracentrifuges incorporate a unique low-friction oil turbine drive capable of providing soft starting and stopping, and smooth acceleration and deceleration. The Sorvall® Automatic Rate Controller and Reograd mode of deceleration take full advantage of this capability to avoid stirback and mixing of the gradient between 0 and 1,000 rpm.

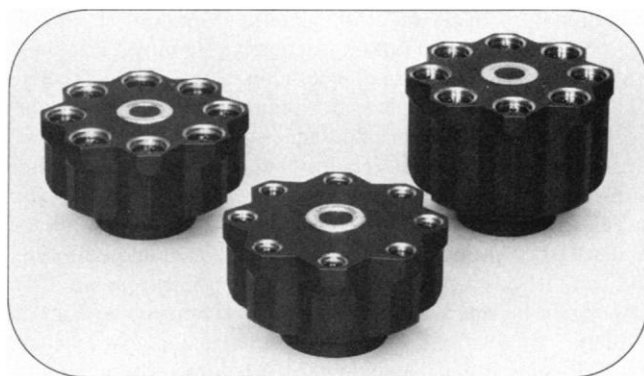
be reduced more than 80% by with new vertical rotors.



The oil turbine drive also eliminates the maintenance and replacement of gears, belts and brushes. The many other features of OTD centrifuges include trouble-free self-contained cooling system; precise, wide-range temperature control; and automatic and manual vacuum pumping system.

For full information on Sorvall® OTD ultracentrifuges and vertical rotors, write to DuPont Instruments, Biomedical Division, Room 36005, Wilmington, DE 19898.

*U.S. Patent 3,998,383



With Sorvall® Centrifuges the spin times are changing.

DuPont Instruments



IMPORTANT DETAILS ARE YOURS



This stereo microscope was designed to serve college needs in viewing biological specimens, insects, ores, minerals and crystals, and the industrial market for scanning industrial parts and electronic components.

Many find it to be a great value in family hobbies such as stamp and coin collecting, identification of antique silver marks, jewelry manufacturing, gem and rock polishing, watch repairing and horticulture.

62090-002

62090-002 STEREO MICROSCOPE, 15X AND 45X

Features sharp definition, wide field image, long working distance 79 to 129 mm and magnification of 15X and 45X.

Equipped with 15X coated, paired, widefield eyepieces; eyepiece tubes adjustable for interpupillary distance; and revolving nosepiece with paired 1X and 3X coated, achromatic objectives. Roomy stage, 220 X 155 mm, contains reversible black and white contrast plate, 94 mm diameter. In fitted styrene shipping case.

\$271.00 each, delivered

Yes, I'd like to order a CENCO Stereo Microscope at \$271.00. My check or company purchase order is attached.

Central Scientific Company, Inc.
Attn: Dept. 99 SCI
2600 So. Kostner Ave.
Chicago, ILL. 60623

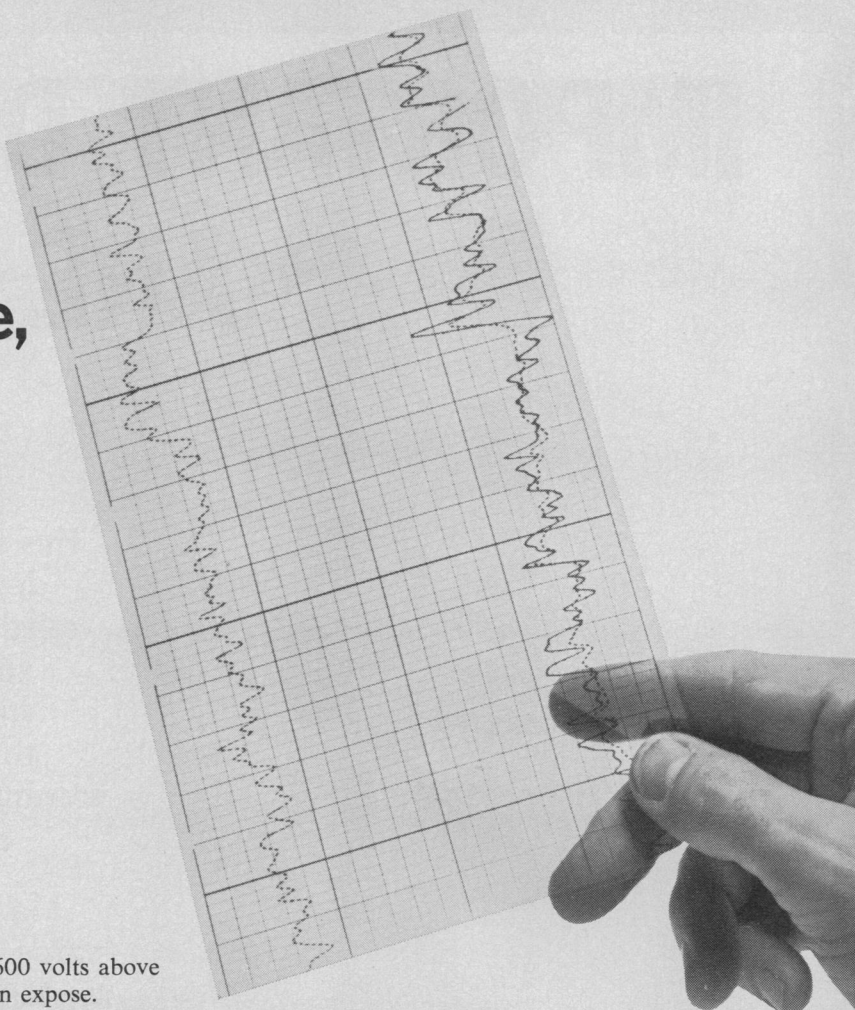
Name _____

Address _____

City _____

State _____ Zip _____

Handle this new film in the light. To add more image, make it light-sensitive again with a corona discharge.



Just put the upper photoconductive surface 600 volts above the internal transparent conductive layer, then expose.

Develop in a second or two by a dip through any of at least three makes of commercial electrographic liquid developers that carry positive-charging toner particles. Negative toners can also be used.

Blow dry and heat the image by hot air or otherwise to fuse the carbon toner particles in place. They'll stay put for a long, long time.

Don't worry about keeping it cool before use or in later storage. It probably will never run out of date. (But don't leave it lying in the sun just before charging and exposing.)

For tone rendition instead of just line reproduction, apply the right kind of electrical bias during development. Tune reproduction characteristics to your needs by varying the relationship between charging voltage and bias.

You didn't know that xerography can reproduce tones without screening? Now you know.

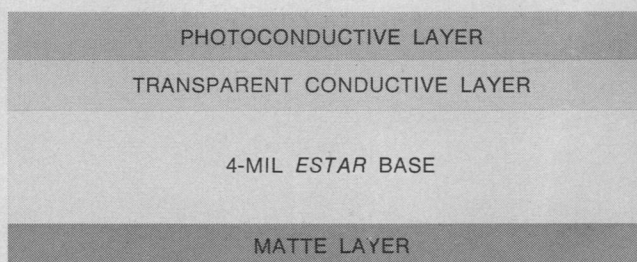
The limits of resolution depend mostly on the nature of the developer-toner particles. We've seen well over 300 line pairs/mm.

The quite transparent active layer is organic instead of inorganic as in hitherto most familiar xerography. (Nothing to do with gardening or chickens.)

Spectral sensitivity of the immediately available product matches the output of the P-47 phosphor in CRTs. No known impediments to sensitize anywhere else in the visible spectrum, as needed.

Speed currently comparable to that of silver-based non-camera films. Reasonable to expect higher speeds before long. This is a whole new ball game, being played by people who have learned a thing or two over the decades about clean, uniform coating of light-sensing layers on a massive scale.

Priced about the same as conventional silver halide film.



The metal spools on which we provide the film are in electrical contact with the transparent conductive layer. The equipment you will design and manufacture to use this film may have a trickier way to control the electrical state of this layer.

Who?

You, of course. The purpose of this ad is to make you take the first step toward involving your organization in an exploration of this technique. That first step consists of getting in touch with Joe Piconski at 716-724-4582. Let him know your outfit wants to explore the possibilities. Mailing address: Graphics Markets Division, Kodak, Rochester, N.Y. 14650.



AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

Science serves its readers as a forum for the presentation and discussion of important issues related to the advancement of science, including the presentation of minority or conflicting points of view, rather than by publishing only material on which a consensus has been reached. Accordingly, all articles published in *Science*—including editorials, news and comment, and book reviews—are signed and reflect the individual views of the authors and not official points of view adopted by the AAAS or the institutions with which the authors are affiliated.

Editorial Board

1977: WARD GOODENOUGH, CLIFFORD GROBSTEIN, H. S. GUTOWSKY, N. BRUCE HANNAY, DONALD KENNEDY, NEAL E. MILLER, RAYMOND H. THOMPSON
1978: RICHARD E. BALZHISER, JAMES F. CROW, HANS LANDSBERG, EDWARD NEY, FRANK W. PUTNAM, MAXINE SINGER, PAUL E. WAGGONER, F. KARL WILLENBROCK

Publisher

WILLIAM D. CAREY

Editor

PHILIP H. ABELSON

Editorial Staff

<i>Managing Editor</i> ROBERT V. ORMES	<i>Business Manager</i> HANS NUSSBAUM
<i>Assistant Managing Editor</i> JOHN E. RINGLE	<i>Production Editor</i> ELLEN E. MURPHY

News and Comment: BARBARA J. CULLITON, *Editor*; LUTHER J. CARTER, CONSTANCE HOLDEN, DEBORAH SHAPLEY, R. JEFFREY SMITH, NICHOLAS WADE, JOHN WALSH, *Editorial Assistant*, SCHERRAINE MACK

Research News: ALLEN L. HAMMOND, *Editor*; RICHARD A. KERR, GINA BARI KOLATA, JEAN L. MARX, THOMAS H. MAUGH II, WILLIAM D. METZ, ARTHUR L. ROBINSON, *Editorial Assistant*, FANNIE GROOM

Associate Editors: ELEANORE BUTZ, MARY DORFMAN, SYLVIA EBERHART, JUDITH GOTTLIEB

Assistant Editors: CAITILIN GORDON, RUTH KULSTAD, LOIS SCHMITT

Book Reviews: KATHERINE LIVINGSTON, *Editor*; LINDA HEISERMAN, JANET KEGG

Letters: CHRISTINE KARLIK

Copy Editors: ISABELLA BOULDIN, OLIVER HEATWOLE

Production: NANCY HARTNAGEL, JOHN BAKER; YA LI SWIGART, ELEANOR WARNER; JEAN ROCKWOOD, LEAH RYAN, SHARON RYAN

Covers, Reprints, and Permissions: GRAYCE FINGER, *Editor*; CORRINE HARRIS, MARGARET LLOYD

Guide to Scientific Instruments: RICHARD SOMMER

Assistant to the Editors: RICHARD SEMIKLOSE

Membership Recruitment: GWENDOLYN HUDDLE

Member and Subscription Records: ANN RAGLAND
EDITORIAL CORRESPONDENCE: 1515 Massachusetts Ave., NW, Washington, D.C. 20005. Area code 202. General Editorial Office, 467-4350; Book Reviews, 467-4367; Guide to Scientific Instruments, 467-4480; News and Comment, 467-4430; Reprints and Permissions, 467-4483; Research News, 467-4321; Cable: Advancesci, Washington. For "Instructions for Contributors," write the editorial office or see page xi, *Science*, 26 March 1976.

BUSINESS CORRESPONDENCE: Area Code 202. Business Office, 467-4411; Circulation, 467-4417.

Advertising Representatives

Director: EARL J. SCHERAGO

Production Manager: MARGARET STERLING

Advertising Sales Manager: RICHARD L. CHARLES

Sales: NEW YORK, N.Y. 10036: Herbert L. Burklund, 11 W. 42 St. (212-PE-6-1858); SCOTCH PLAINS, N.J. 07076: C. Richard Callis, 12 Unami Lane (201-889-4873); CHICAGO, ILL. 60611: Jack Ryan, Room 2107, 919 N. Michigan Ave. (312-DE-7-4973); BEVERLY HILLS, CALIF. 90211: Winn Nance, 111 N. La Cienega Blvd. (213-657-2772); DORSET, VT. 05251: Fred W. Dieffenbach, Kent Hill Rd. (802-867-5581)

ADVERTISING CORRESPONDENCE: Room 1740, 11 W. 42 St., New York, N.Y. 10036. Phone: 212-PE-6-1858.

The Leadership of the Geological Survey

In its actions with respect to science, technology, and medicine, the Carter Administration has compiled a mixed record. During the transition period last December, actions of some of the Carter transition team were amateurish. At that time, a number of leading scientists received telephone calls asking them to identify possible advisers about science-related positions in the government. Some of the callers obviously knew little about the scientific community. When one of the team was told to consider the name of Jerome Wiesner, the caller asked "How do you spell it and where is he at?"

Within days of the Inauguration in January, there were peremptory firings of heads of agencies before replacements were in sight. In the filling of vacancies, the physical sciences did not fare very well. For example, Robert White, an excellent scientist and administrator of the National Oceanic and Atmospheric Administration, who resigned of his own volition, has been replaced by a lawyer. The post of director of the National Bureau of Standards, long vacant, has still not been filled.

Lately, the performance of the Administration has improved markedly and excellent appointments have been announced. However, the recent dismissal of Vincent McKelvey, director of the U.S. Geological Survey, was disquieting for it seemed a step toward politicizing the Geological Survey.

During nearly 100 years the Survey has maintained a tradition of excellence recognized throughout the world. It is one of the few federal agencies whose activities represent an investment for the future. Throughout its history, the Survey has been directed by distinguished geologists. In turn, the heads of the operating divisions have been scientists broadly recognized for their competence. The Survey has been a research organization. It has been customary for professional staff to engage in fieldwork at some time during the year. Survey geologists have endured hardships in the process of studying the rocks on virtually every square mile of this country as well as on much of the rest of the earth. They have a degree of contact with the world outside Washington that is unusual in a federal agency.

A report on the Geological Survey prepared for Senator Jackson by Allen F. Agnew has provided a historical background and listed some of many major programs and goals.* In the report Dr. McKelvey summarized what he considered to be the mission of his organization. "The Survey's principal mission is to provide the knowledge about the earth that can serve as a basis for the identification and evaluation of resource and land use alternatives and for policy- and decision-making on the part of the Administration, the Congress, and the general public. Although the Survey's principal mission is to develop basic information on the earth and its resources, its responsibilities for the classification of Federal lands and the supervision of lease development are no less important. Essential in these missions is to insure that the nation's public resources are identified, conserved, and developed wisely, that the public receives its fair share value of leased resources, and that mineral exploration and production do minimum damage to other resource or environmental values. The Survey uses its scientific and technical resources to help achieve these objectives."

The Geological Survey has traditions of rigor and excellence and an uncommon respect for facts and truth. The nation would lose a great institution if an inappropriate choice of the new director were made. A committee of the National Academy of Sciences has nominated a panel of first-class scientists who are qualified to serve. If the name of one of these is submitted to the Senate, damage will be limited. Joan Davenport, Assistant Secretary for Energy and Minerals at the Department of the Interior has stated that a distinguished scientist will be chosen. Her commitment to foster this action is reassuring.—PHILIP H. ABELSON

*A. F. Agnew, *The U.S. Geological Survey* (Committee Print, Senate Committee on Interior and Insular Affairs, 94th Congress, 1st Session, December 1975).



The Computer for the Professional

Whether you are a manager, scientist, educator, lawyer, accountant or medical professional, the System 8813 will make you more productive in your profession. It can keep track of your receivables, project future sales, evaluate investment opportunities, or collect data in the laboratory.

Use the System 8813 to develop reports, analyze and store lists and schedules, or to teach others about computers. It is easily used by novices and experts alike.

Reliable hardware and sophisticated software make this system a useful tool. Several software packages are included with the machine: an advanced disk operating system supporting a powerful BASIC language interpreter, easy to use text editor, assembler and other system utilities. Prices for complete systems start at \$3250.

See it at your local computer store or contact us at 460 Ward Dr., Santa Barbara, CA 93111, (805) 967-0468.

**PolyMorphic
Systems**

(Continued from page 44)

ciety's annual forum, "Research for Survival," held in Toronto in May. Founded in 1970, SCITEC seeks to foster interdisciplinary communication among Canadian scientists and to bring science and technology to bear on problems of development, public policy, and public understanding. Members include individuals as well as more than 60 professional societies and an active contingent in both houses of Parliament.

CONICIT (Costa Rican National Council of Scientific and Technological Research) also was admitted to the IA as an affiliated organization during the IA annual meeting.

The two organizations were formally accepted into the federation at the inaugural of the 4-day symposium on marine sciences, one of an ongoing series sponsored by the IA. The July symposium, which was cosponsored by IA and CONICIT, brought together 60 to 70 scientists from a dozen countries in the Americas, as well as representatives from Japan. Arranged by Manuel Murillo, vice president of the University of Costa Rica, and Roger Revelle of the University of California at San Diego, the conference addressed such topics as aquaculture; ecology and environmental protection; education; training and technology transfer in marine sciences; and cooperative research in the marine field. The program included some two dozen presentations during regular panels and a similar number of contributed papers. The entire proceedings will be published and some of the papers will appear in *Interciencia*, the Interciencia Association's trilingual journal.

In the past, the IA has sponsored symposia in cooperation with AAAS, the Brazilian Society for the Progress of Science, and the Venezuelan Association for the Advancement of Science. Its symposium program, along with publication of the journal *Interciencia*, constitutes a primary activity of the Association, which was founded in 1974 by AAAS and representatives of scientific societies of other American nations. In addition to Canada and Costa Rica, countries represented in the federation include Argentina, Brazil, Colombia, Mexico, the United States, and Venezuela. President of IA is Oscar Sala of the Brazilian Society; vice president is Leonard M. Rieser of AAAS; and secretary-treasurer is Salvatore Pluchino of the Venezuelan Association. Editor of the journal *Interciencia* is Marcel Roche of Venezuela.

7 OCTOBER 1977



The Sinclair Cambridge Programmable goes way beyond just helping you with calculations — it actually Does Them For YOU! Whether your work or personal business involves Finance, Science, Statistics, Engineering, Electronics, Mechanics, Dynamics, or Advanced Math, this incredible machine will save you hours upon hours of work with its simple, flexible, thru-the-keyboard program entry and operation. It also features conditional and unconditional branch instructions (go to and go if negative).

PLUS, there is a Special Stop Facility, allowing you to STEP through the program, checking that it has been entered correctly. In the event of an

Programmable History...

Sinclair Pioneers a 36-STEP, Fully Programmable Computer For An Astonishing \$29.95!

error, the "Learn Key" lets you correct single steps without destroying any of the remainder of the program.

They provide a comprehensive, unconditional 1-Year Guarantee with each unit. Incl. 9V. Batt.

Use The Vast 294-Program Library To Tailor The Machine TO YOUR OWN SPECIALTY; Unlike more expensive "specialist" calculators, the Sinclair Cambridge Programmable can be programmed to handle calculations concerned with ANY specialty, just like a full-size computer! You can devise your own programs or use the Sinclair Library which includes 77 General/Finance/Statistics programs, 93 Mathematics programs, 77 Physics/Engineering programs and 47 Electronics programs.

Using these standard programs the machine solves problems from quadratic equations (where the program gives real and imaginary roots) to twin-T filter design, and from linear regression to bond yields. To realize the full power of this computer the Program Library is a must, however the basic unit comes complete with 12 sample programs and full instructions for easily entering your own programs, even if you are new to the concept of programmability in a calculator.

Don't Forget That It Is A Standard Calculator As Well . . . Plus A Full Scientific Computer with 8-digit floating point notation, 3-function memory, algebraic logic, brackets, etc. Sinclair, a longtime world leader in micro-electronics, pioneered the truly pocketable pocket calculator a few years ago and recently introduced the world's First Pocket T.V.

The **Starshine Group**, Dept. S-147, 1114 State Street, Suite 233, Santa Barbara, CA 93101

FOR INSTANT SERVICE, CALL TOLL-FREE: 1-800-528-6060 Ext. 1037. Anz. Res. Call Collect 602-955-9710.

Or Send Coupon:

Please promptly send me _____ Sinclair Cambridge Programmable(s) @ \$29.95 (plus \$3 postage & insurance); ea. I have the option of returning it within 1 week of receipt for an immediate refund.

- ☐ Also include _____ AC line adapter(s) @ \$4.95 ea.
☐ Also include _____ 294-Program Library Set(s) @ \$10 per complete set.
☐ Check or M.O. Enclosed (Calif. Res. Add 6% Sales Tax)
☐ Charge the Credit Card Checked Below:
☐ American Express ☐ BankAmericard
☐ MasterCard ☐ CarteBlanche
☐ Diner's Club

Credit Card # _____

MasterCharge Bank # _____

Exp. Date _____

Name _____

Address _____

City/State/Zip _____

Signature _____

CLEARANCE

AAAS is having a sale. All of our 1969-1975 annual meeting audiotapes must be sold.

With prices slashed at least 1/3 off, you can buy several audiotapes for either personal or classroom use. Annual meeting tapes are recorded in sessions: some tape titles have only one session; others might have two or more sessions. Our sale prices are \$12 a session for cassette recordings or \$6 a session for open reel tapes.

Only a limited number of tapes are available in the following subjects:

BIOLOGICAL SCIENCES CHEMISTRY ENGINEERING
 EARTH SCIENCES INFORMATION AND COMMUNICATION
 MATHEMATICS AND LOGIC MEDICAL SCIENCES
 PHYSICAL SCIENCES PSYCHOLOGY ANTHROPOLOGY
 ECOLOGY ECONOMICS SOCIOLOGY EDUCATION

We don't have enough space to list all 149 titles, but you can find the information in the 1976 AAAS audiotapes brochure. If you don't have a brochure, write to AAAS Audiotape Program, 1515 Massachusetts Avenue, N.W., Washington, D.C. 20005.