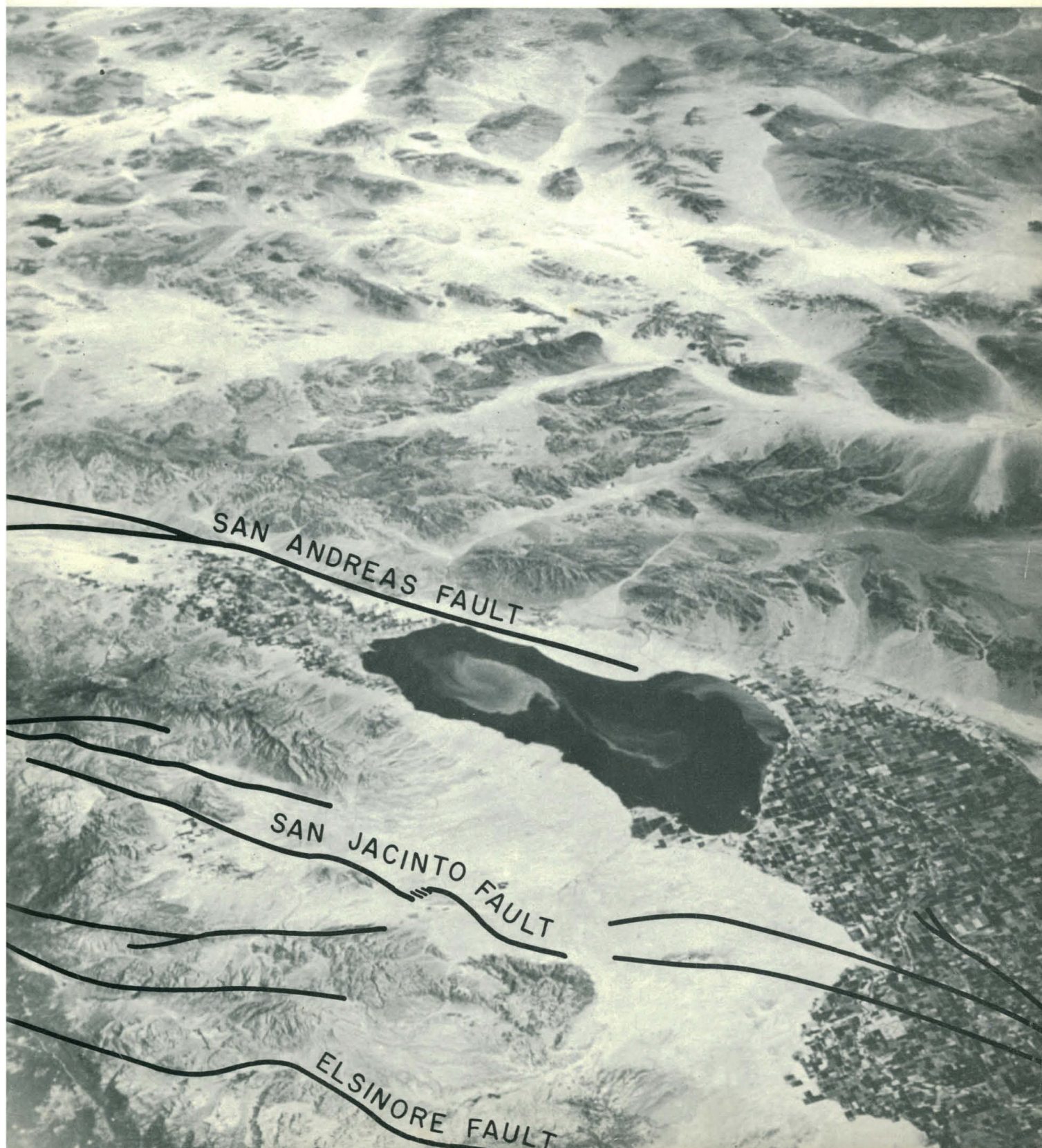


SCIENCE

6 October 1972

Vol. 178, No. 4056

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



Beckman introduces the automatic half of your peptide synthesis team.



The Model 990 Solid Phase Peptide Synthesizer follows your exact instructions—and is quick about it (a coupling every 4 hours is possible, depending on what you're synthesizing). It guards your sample at all times, shows you precisely where you are in the synthesis program, and accepts changes in strategy with consummate ease.

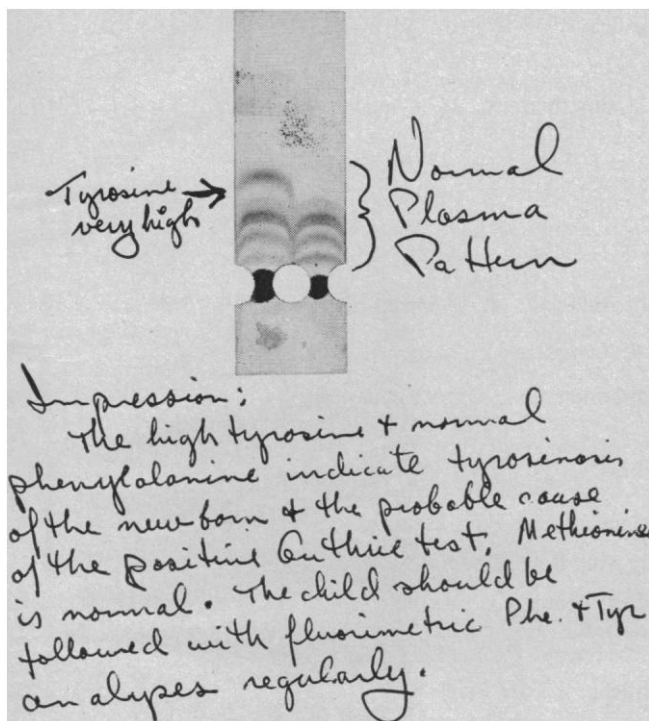
Moreover, we provide a training course in Palo Alto, service no matter where you are, and the finest t-Boc amino acids you can buy.

The new Beckman Synthesizer is described in Brochure SB-387; write for your copy to Spinco Division, Beckman Instruments, Inc., 1117 California Ave., Palo Alto, Ca. 94304.

Beckman® INSTRUMENTS, INC.

INTERNATIONAL SUBSIDIARIES: AMSTERDAM; CAPE TOWN; GENEVA; GLENROTHES, SCOTLAND; LONDON; MEXICO CITY; MUNICH; PARIS; STOCKHOLM; TOKYO; VIENNA. Helping science and industry improve the quality of life.

We want to be useful ...and even interesting



Learning how to screen for odd metabolites

Paul Tocci, Ph.D., of Miami, Fla. is an assistant professor of pediatrics and director of a biochemical genetics laboratory. He offers these observations concerning the above thin-layer chromatogram of a plasma sample from a 14-day-old female infant.

Tocci has had more experience in this matter than most prospective users of KODAK CHROMAT/O/SCREEN Analysis

Kits, having contributed heavily to their availability for the rapid, low-cost screening of patients for abnormalities that involve amino acids, sugars, or catecholamines.

If this particular approach is to fulfill its promise in public health, thin-layer chromatography will need to become widely familiar in the hospital laboratory.

We remember how in the early years of the century x-ray was a gimmick and radiology was yet to be conceived as a medical discipline. There is, of course, a difference between diagnosis and screening; thus we doubt that the TLC pattern will ever compare with the radiograph in its demands on the interpreter's experienced judgment, but it does not quite yield its message after a few minutes' study of the directions in the box.

To the many who have acquired Chromat/O/Screen kits and feel the need for further consultation on troublesome questions, Kodak offers this "hot line" phone number for collect calls: **716-325-6595**.

Furthermore, we are launching a massive educational program in many cities through "wet" workshops. To signify interest in attending, or merely to receive the newest revisions of the instruction booklets incorporating the rapidly developing body of experience with TLC in screening either for metabolic disorders or for drug-abuse detection, please communicate with Kodak, Dept. 909, Rochester, N.Y. 14650.

Call for collaborators

If the above invitation creates the impression that Kodak is deadly serious about dedicating corporate resources to improving the delivery of preventive medical care to the public through low-cost clinical chemistry, that is our intention.

Already an employer of 65 persons holding the degree Doctor of Medicine, we expect during the coming year to add further strength to our biomedical resources by enlisting the interest of biochemists at the postdoctoral level.

But it is not fellowships we are offering here. It is *employment* for scientists who can see the possibility of significant contributions to society and science through the facilities and skills of a highly successful, long-established business corporation whose present Chief Executive Officer joined the organization in the role of chemist, as did his predecessor in that office. To thrive best in the Kodak environment, a scientist needs aside from creative research initiative a desire to demonstrate leadership ability for both basic and applied research.

We see specific openings as follows:

- An immunologist capable of fundamental studies and exploration leading to analytical and clinical applications.

- An enzymologist to discover, purify, and utilize new enzymes. Familiarity with the methods of purifying and characterizing proteins is, of course, essential. Experience in kinetics would be desirable.
- A biochemist with a background for fruitful study of why metabolic pathways in microorganisms run the way they do.
- A microbiologist with the outlook of a chemical engineer, to bring fermentations to the pilot-plant level.

An indication of interest should be addressed to Dr. D. B. Glass, Eastman Kodak Company, Rochester, N.Y. 14650.



Also involved in photography

An equal-opportunity employer m/f

6 October 1972

Vol. 178, No. 4056

SCIENCE

LETTERS	Acupuncture: <i>A. Taub</i> ; Brazil: <i>H. Grobman</i> ; Marine Discoveries: <i>G. Lill</i> ; "Women's Lib": <i>R. G. Lynch</i> ; Bureaucracy: <i>M. Chessin</i> ; Courtesy: <i>L. G. Silversmith</i>	9
EDITORIAL	Latin American Aspirations	13
ARTICLES	Crustal Spreading in Southern California: <i>W. A. Elders et al.</i>	15
	Carrier-Mediated Ion Transport: <i>P. Luger</i>	24
	Fermat's Mathematics: Proofs and Conjectures: <i>M. S. Mahoney</i>	30
NEWS AND COMMENT	Medicine at Michigan State (II): The Architecture of Accountability	36
	Earthquake Research: A Consequence of the Pluralistic System	39
	OTA Moves Ahead, Science Policy Act Bogs Down	41
	Chinese Doctors to Visit the United States	42
RESEARCH NEWS	Gasification: A Rediscovered Source of Clean Fuel	44
	Phthalic Acid Esters: Biological Impact Uncertain	46
BOOK REVIEWS	The Evolution of Primate Behavior, reviewed by <i>J. H. Crook</i> ; Populations in a Seasonal Environment, <i>E. R. Pianka</i> ; Mechanisms Regulating the Discharge of Motoneurons, <i>M. Kuno</i> ; The Cells and Tissues of the Immune System, <i>B. F. Argryis</i> ; Pulmonary Reactions to Coal Dust, <i>S. Rae</i> ; Sulfur Research Trends, <i>F. Ramirez</i> ; Inorganic Chemistry of Vitamin B ₁₂ , <i>G. N. Schrauzer</i>	48
REPORTS	Magnetic Dynamo in the Moon: A Comparison with the Earth: <i>E. H. Levy</i>	52
	Phosphorescence of Adsorbed Ionic Organic Molecules at Room Temperature: <i>E. M. Schulman</i> and <i>C. Walling</i>	53

BOARD OF DIRECTORS	MINA REES Retiring President, Chairman	GLENN T. SEABORG President	LEONARD M. RIESER President-Elect	DAVID BLACKWELL RICHARD H. BOLT	LEWIS M. BRANSCOM BARRY COMMONER
VICE PRESIDENTS AND SECTION SECRETARIES	MATHEMATICS (A) John W. Tukey F. A. Ficken	PHYSICS (B) Herbert Friedman Rolf M. Sinclair	CHEMISTRY (C) Martin Paul Leo Schubert	ASTRONOMY (D) George B. Field Arlo U. Landolt	HISTORY AND PHILOSOPHY OF SCIENCE (E) Everett Mendelsohn Raymond J. Seeger
	PSYCHOLOGY (I) Dale B. Harris William D. Garvey	SOCIAL AND ECONOMIC SCIENCES (K) James S. Coleman Harvey Sapolsky	AGRICULTURE (O) Roy L. Lovvorn Michael A. Farrell	INDUSTRIAL SCIENCE (P) Jacob E. Goldman Jordan D. Lewis	EDUCATION (Q) Lloyd K. Johnson Phillip R. Fordyce
	PHARMACEUTICAL SCIENCES (Np) Linwood F. Tice John Autian				
DIVISIONS	ALASKA DIVISION Gordon Harrison President Irma Duncan Executive Secretary	PACIFIC DIVISION Roy A. Young President Robert C. Miller Secretary	SOUTHWESTERN AND ROCKY MOUNTAIN DIVISION J. Linton Gardner President Marlowe G. Anderson Executive Secretary		

SCIENCE is published weekly, except the last week in December, but with an extra issue on the third Tuesday in November, 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. Copyright © 1972 the American Association for the Advancement of Science. Annual subscription \$20; foreign postage: Americas \$3; overseas \$5; air freight to Europe, North Africa, Near East \$1 single copies \$1 (back issues, \$2) except *Guide to Scientific Instruments* which is \$4. School year subscription: 9 months, \$15; 10 months, \$16.75. Provide 4 weeks notice of change of address, giving new and old address and zip codes. Send a recent address label. SCIENCE is indexed in the *Reader's Guide to Periodical Literature*.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

Carbon: A Suggested New Hexagonal Crystal Form: <i>A. G. Whittaker</i> and <i>G. M. Wolten</i>	54
Evidence for the Neutral Hypothesis of Protein Polymorphism: <i>T. Yamazaki</i> and <i>T. Maruyama</i>	56
Human-Mouse Cell Hybrids: A Suggestion of Structural Mutation for Dipeptidase-2 Deficiency in Mouse Cells: <i>T. B. Shows, J. May, L. Haley</i>	58
Virions from Progressive Multifocal Leukoencephalopathy: Rapid Serological Identification by Electron Microscopy: <i>J. B. Penney, Jr., et al.</i>	60
Chromatid Breakage: Differential Effect of Inhibitors of DNA Synthesis during G ₂ Phase: <i>M. Karon and W. F. Benedict</i>	62
Membrane Permeability: Cation Selectivity Reversibly Altered by Salicylate: <i>H. Levitan and J. L. Barker</i>	63
Cell Culture on Artificial Capillaries: An Approach to Tissue Growth in vitro: <i>R. A. Knazek et al.</i>	65
Chemical Trail-Following by Flying Insects: A Mechanism for Orientation to a Distant Odor Source: <i>S. R. Farkas and H. H. Shorey</i>	67
Lead Content of Human Hair (1871-1971): <i>D. Weiss, B. Whitten, D. Leddy</i>	69
Expression of Lactate and Malate Dehydrogenases in Tumors Induced by SV40 and 7,12-Dimethylbenz(a)anthracene: <i>R. Prasad, N. Prasad, S. S. Tevethia</i>	70
Self-Stimulation in the Ventromedial Hypothalamus: <i>G. G. Ball</i>	72
Taste Stimuli: Time Course of Peripheral Nerve Response and Theoretical Models: <i>J. R. Faull and B. P. Halpern</i>	73
6-Hydroxydopa Depletion of Brain Norepinephrine and the Facilitation of Aggressive Behavior: <i>N. B. Thoa et al.</i>	75
Technical Comments: Uranium in Runoff: <i>R. D. Munson; R. F. Spalding and</i> <i>W. M. Sackett; Cometary Hydrogen and Hydroxyl Comas: M. K. Wallis;</i> <i>A. H. Delsemme</i>	77
AAAS ANNUAL MEETING Health and Biology	79

WARD H. GOODENOUGH
CARYL P. HASKINS

DANIEL P. MOYNIHAN
PHYLLIS V. PARKINS

WILLIAM T. GOLDEN
Treasurer

WILLIAM BEVAN
Executive Officer

GEOLOGY AND GEOGRAPHY (E)

Frank C. Whitmore
William E. Benson

ENGINEERING (M)

Newman A. Hall
Raynor L. Duncombe

INFORMATION AND COMMUNICATION (T)

Andrew A. Aines
Scott Adams

BIOLOGICAL SCIENCES (FG)

Ian Sussex
Richard J. Goss

MEDICAL SCIENCES (N)

Robert W. Berliner
F. Douglas Lawrason

STATISTICS (U)

W. Duane Evans
Ezra Glaser

ANTHROPOLOGY (H)

Richard N. Adams
Anthony Leeds

DENTISTRY (Nd)

Joseph L. Henry
Sholom Pearlman

ATMOSPHERIC AND HYDROSPHERIC SCIENCES (W)

John A. Knauss
Louis J. Battan

COVER

Salton Sea and Imperial Valley of California looking toward Arizona. The valley is lengthening at up to 5 centimeters per year by crustal spreading motions on the San Andreas, San Jacinto, and Elsinore fault systems. See page 15. [Gemini V photo, courtesy of NASA and Department of Geography, University of California, Riverside]

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.

Some things are changing for the better.

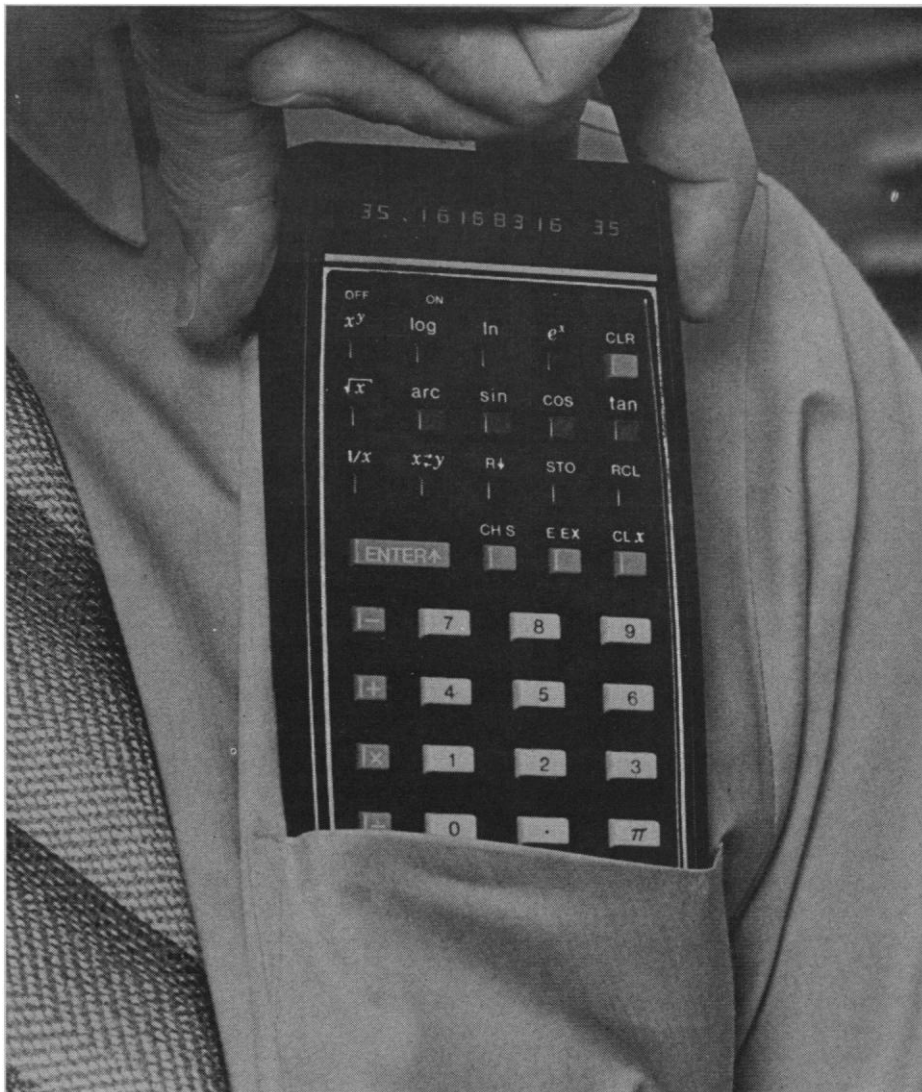
Many people know us as an instrument manufacturer: we make more than 2,000 products for measurement, test and analysis. Others know us as a computer company: more than 10,000 own our programmable calculators and computers. We prefer to think that our business is to serve measurement, analysis and computation needs . . . in science, industry, medicine and education. That is the rationale behind every new instrument, computer or system that we tell you about in these ads. This month:

The HP-35 Shirt Pocket Calculator lets you make complex calculations like this one approximately five times faster than with your slide rule . . . with 10 place accuracy . . . and without a single scratch note!

$$\alpha_H = 1 + [3 \times 10^{-2}](10^{7.21}) + [8.7 \times 10^{-3}](10^{2.16})$$

$$pH = -\log \sqrt{\frac{1}{\alpha_H} \left(\frac{3 \times 10^{-2}}{10^{11.7}} + \frac{8.7 \times 10^{-3}}{10^{7.21}} \right)}$$

*Chemists will recognize this as a calculation of the pH of a buffer solution for the mixture of Na_2HPO_4 @0.03 M/l. and NaH_2PO_4 @ 8.7×10^{-3} M/l.



The new HP-35 Pocket Computer: a boon for scientists, engineers, or almost anyone.

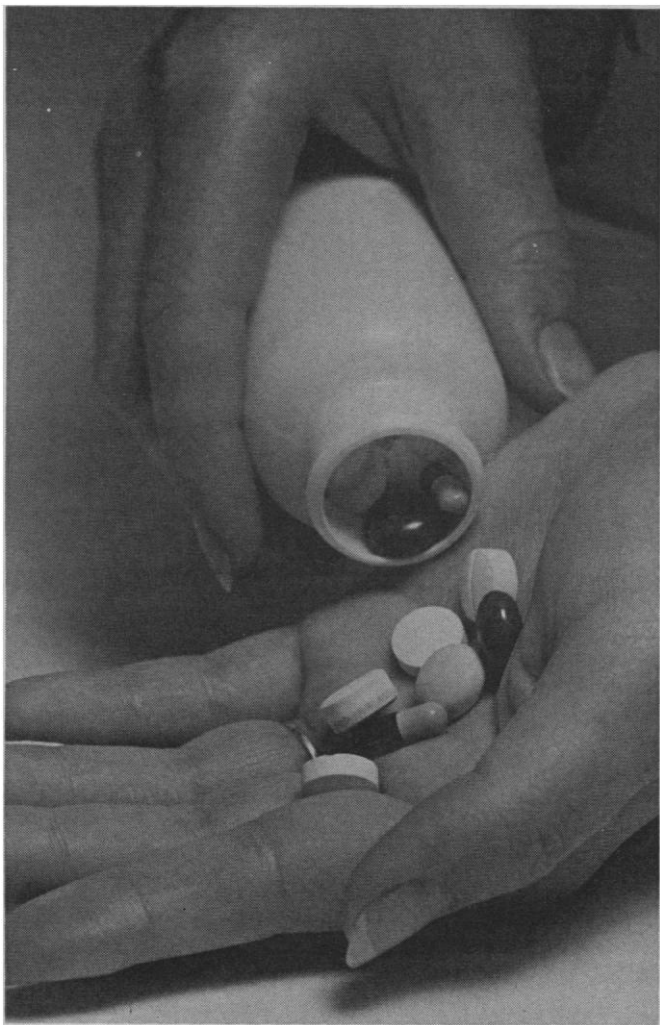
When you first hear about it, it sounds like an electronic slide rule, the kind that's been available only in science fiction. Although it's only 3 by 6 inches and weighs 9 ounces, with rechargeable battery, it computes transcendental functions with a single keystroke, in less than a second. It calculates positive and negative numbers in floating point or scientific notation, automatically keeps track of the decimal throughout its 200-decade range, and displays answers that are accurate to the 10th significant digit.

And when you use it, you soon realize that it is more like a computer than a super slide rule. The secret is its 4-register operational stack. Solidly based on computer theory, it holds intermediate answers in a higher register

and automatically brings them back when they are required for further calculations. The calculator also has a fifth register that lets you store any number and recall it to the working register at the touch of a key.

The power of our little wonder is illustrated in the calculation shown above. The HP-35 solves this problem in about 60 seconds and displays the answer to 10 significant digits, without a single scratch note.

The new HP-35 Pocket Calculator contains the equivalent of 30,000 transistors in specially designed MOS/LSI circuits. Yet it costs just \$395 (domestic US price only). You may have to wait a while because demand has been so great. But if your people need this kind of computation power, it's worth the wait. Just use the coupon and we'll send full information to you.

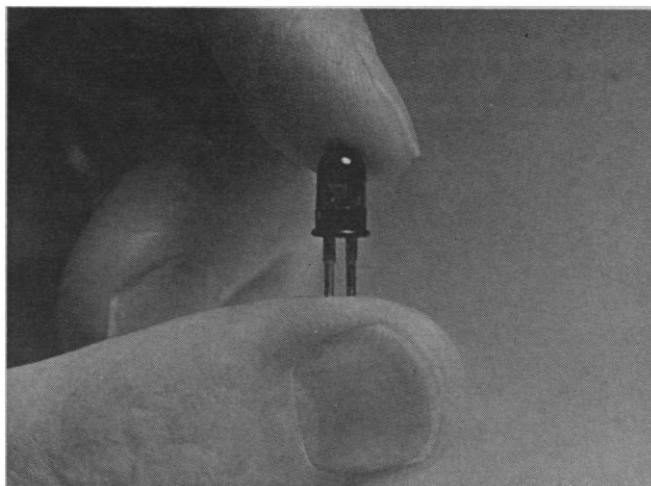


A faster, more efficient way to analyze drugs.

Not much can happen — neither emergency treatment for a drug overdose victim, nor prosecution of the pusher — until the drug has been positively identified. In large cities, where drug emergencies often reach into the hundreds daily, the chemist faces an enormously difficult problem, especially with traditional methods of chemical analysis. But there is a better way.

A laboratory in Charlotte (N.C.) recently sent us some powder from a confiscated pill for analysis on the new HP Gas Chromatograph/Mass Spectrometer/Computer System. Twenty minutes later, the analysis was complete: the pill contained heroin, morphine, and barbituric acid.

Fast, complete and positive, the analysis satisfied all medical and legal requirements. The HP system also takes a load off the lab's scientific staff because it can be successfully operated by technicians who have no special knowledge of mass spectroscopy or computers. The computer itself controls the operation of the spectrometer and records the mass spectrum while it makes all the necessary calculations, automatically. It can also compare the results of the analysis against a taped library of suspected components (in this case, a library of the mass spectra of 100 dangerous drugs) and automatically identify each of the sample constituents by name, positively. Where drugs are involved, that's an essential requirement. Just check the coupon for full information.



Try our solid-state lamp, free.

When Thomas Edison invented it, the incandescent lamp was one of the brightest ideas ever. It still is, if your object is illumination. But for display or indication, the new solid-state lamps (LED's) win hands down: they last at least 10 years and use only a few milliamps of current.

Because we are convinced that hands-on experience with an LED surpasses any description, we'd like to send you one of our 5082-4400 Series free. Use it even once, and we'll wager you'll never use any other kind of display lamp again.

Our LED is a gallium arsenide phosphide diode that's hard to ignore. You can see its red glow several yards away at any angle to 180°. It lights up when you connect a mere 1.6 volts to its rugged leads, draws only 2 to 10 milliamps, and includes a clip for easy panel-mounting.

Use the coupon to send for your free LED. If it turns you on, we're ready to ship quantity orders immediately.

For more information on the calculator, our systems or a free LED fill out the coupon and send to: Hewlett-Packard, 1510 Page Mill Road, Palo Alto, California 94304; Europe: P.O. Box 85, CH-1217 Meyrin 2, Geneva, Switzerland; Japan: YHP, 1-59-1, Yoyogi, Shibuya-Ku, Tokyo, 151.

00219

Please send:

☐ HP-35 Calculator information.

☐ HP Gas Chromatograph/Mass Spectrometer/Computer System data.

☐ A free LED.

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

HEWLETT  PACKARD

Ultra Pure High Specific Activity

^{32}P NUCLEOTIDES

*The compounds marked with
an asterisk are available at

20-100Ci/mmole

on a scheduled basis.

Call or write for details.

***Adenosine 5'-triphosphate, tetra
(triethylammonium) salt [α - ^{32}P] NEG-003**
1-10Ci/mmole \$100/100 μCi \$190/500 μCi
\$250/1mCi

**Adenosine 5'-triphosphate, tetra
(triethylammonium) salt [γ - ^{32}P] NEG-002**
2-10Ci/mmole \$75/100 μCi \$100/500 μCi
\$150/1mCi

**Adenosine 5'-triphosphate, tetra
(triethylammonium) salt [γ - ^{32}P] NEG-002X**
>10Ci/mmole \$75/100 μCi \$100/500 μCi
\$150/1mCi

**Adenosine 3', 5'-cyclic phosphate,
triethylammonium salt [^{32}P] NEG-011**
1-10Ci/mmole \$225/500 μCi \$400/1mCi

***Cytidine 5'-triphosphate, tetra (triethylammonium)
salt [α - ^{32}P] NEG-008**
1-10Ci/mmole \$105/100 μCi \$200/500 μCi
\$350/1mCi

***Guanosine 5'-triphosphate, tetra
(triethylammonium) salt [α - ^{32}P] NEG-006**
1-10Ci/mmole \$105/100 μCi \$200/500 μCi
\$350/1mCi

**Guanosine 5'-triphosphate, tetra
(triethylammonium) salt [γ - ^{32}P] NEG-004**
2-10Ci/mmole \$85/100 μCi \$150/500 μCi
\$225/1mCi

**Thymidine 5'-triphosphate, tetra
(triethylammonium) salt [α - ^{32}P] NEG-005**
1-10Ci/mmole \$85/100 μCi \$185/500 μCi
\$325/1mCi

***Uridine 5'-triphosphate, tetra (triethylammonium)
salt [α - ^{32}P] NEG-007**
1-10Ci/mmole \$105/100 μCi \$200/500 μCi
\$350/1mCi

All compounds in aqueous solution,
shipped in dry ice.



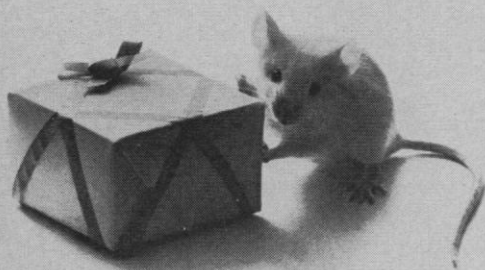
New England Nuclear

575 Albany Street, Boston, Mass. 02118
Customer Service 617-482-9595

Canada: NEN Canada Ltd., Dorval, Quebec. Tel: (514) 636-4971

Europe: NEN Chemicals GmbH, D6072 Dreieichenhain, Siemenstrasse 1, Germany. Tel: Langen (06103) 8353

here's
something
very mice
for you



It's our new catalog for small laboratory animal care equipment. In it are products which have been thoroughly

reviewed, and tested to meet exacting research and breeding requirements.

Many items are brand-new.

It comprises one of the most complete lines of cages, bedding and accessories for small lab animals we know of.

And it's yours for the asking.

It's from Lab Products, Inc., the company that is experienced in small animal care equipment. For your copy, just write or call Lab Products, Inc., 635 Midland Avenue, Garfield, N. J. 07026, Phone (201) 478-2535.

**lab products
inc** a **Medi** company

Paulo was recently halted when it was recognized that the large concentrations of students in a dormitory are not politically expedient. The buildings reportedly will be converted into classrooms and offices.

HULDA GROBMAN

Department of Education, Brooklyn College, City University of New York, Brooklyn 11210

Marine Discoveries

In his report of 23 June (News and Comment, p. 1312), Wade attributes the discovery of the Hudson River's submarine canyon and the discovery of the Gulf of Mexico offshore submarine salt domes to W. Maurice Ewing, who has recently announced his intention to retire as director of the Lamont-Doherty Geological Observatory. Ewing is one of the most prodigious workers in marine geophysics, submarine geology, and oceanography that the world has ever seen. Unfortunately, he did not arrive early enough on the scene to have discovered the submarine Hudson Canyon, and many workers have contributed to the discovery of submarine salt domes in the Gulf of Mexico.

During the years 1842-44, the U.S. Coast and Geodetic Survey (USC&GS) was surveying the approaches to New York (1). The results of the survey were reported by Pourtales and commented on by Lindenkohl. Both of these gentlemen were employed by the USC&GS. Lindenkohl said:

The sea bottom off the entrance to New York lower bay is characterized by features peculiar to that region. These include:

1. A well defined submarine valley.
2. An area of clay bottom extending about 100 miles seaward.
3. A deep ravine at the edge of the continental slope.

J. W. Spencer, in 1905 (2), credits J. D. Dana with being the first to recognize the submerged channel as that of the Hudson River,

formed when the continent stood at a greater altitude above the sea than it does now. . . . But the discovery of the canyon was first announced by Prof. A. Lindenkohl in 1885. . . .

The earliest reference I could find to submarine salt domes in the Gulf of Mexico is the work of Francis P. Shepard (3), published in 1937. He had been working just prior to that on board the USC&GS *Hydrographer*,

which was under the command of Captain F. S. Borden. Shepard stated that, "Altogether at least 26 submarine domes have been recognized." Shepard goes on to say in his summary:

All lie either near the outside of the continental shelf or on the upper portion of the continental slope. . . . The salt domes are not only related to the outer portion of the Mississippi submarine trough, but they are found also all along the outer edge of the continental shelf for at least 180 miles west of the Mississippi passes. . . .

In 1947, the U.S. Geological Survey, with the sponsorship of the Office of Naval Research, under the direction of Henry Joesting, conducted a gravity survey in the Gulf of Mexico, during which several salt domes were discovered. The resulting gravity map was placed on open file by the Geological Survey in late 1947 or early 1948.

In 1957, Lankford and Curray (4) speculated that Stetson Bank in the Gulf of Mexico was a surface expression of the salt dome. Ewing began to report on his salt dome discoveries in 1962 (5). He and others on board the *Vema* discovered Sigsbee Knolls during *Vema* cruise 3 in 1954. During *Vema* cruise 17, in January 1961, they studied 20 structures by seismic reflection, profiling those which were judged by them to be piercement salt domes. Also, in 1962, Ewing (6) and others reported that

Salt domes existed in a narrow zone approximately midway between the scarps (Sigsbee Scarp-Campeche Shelf Scarp). Twenty-one structures . . . strongly resembling and identified as piercement salt domes were discovered.

In 1968, the *Glomar Challenger* drilled into some of the domes of Sigsbee Knolls, of which there are more than 150 known. Ewing participated in this work (7). At hole No. 2, he and others reported the following results:

Below 136 meters of Pleistocene and Pliocene pelagic sediments, a typical cap rock with gypsum, sulfur, limestone, oil, gas and traces of anhydrite was found. The presence of deep salt beds, probably Jurassic in age, is strongly suggested. This hole was abandoned and plugged, since there were rigid instructions to avoid any possibility of an uncontrolled flow of oil.

There are many other references to these salt domes in the Gulf of Mexico. These will suffice to show that many participated in their discovery.

GORDON L.H.I.

National Ocean Survey, National Oceanic and Atmospheric Administration, Rockville, Maryland

References

1. L. F. Pourtales, *Coast Survey Report* (U.S. Coast and Geodetic Survey, Washington, D.C., 1869), appendix XI; A. Lindenkohl, *Amer. J. Sci.* **29**, 475 (1885).
2. J. W. Spencer, *Amer. J. Sci.* **19**, 1 (1905).
3. F. P. Shepard, *Bull. Geol. Soc. Amer.* **48**, 1354 (1937).
4. R. R. Lankford and J. R. Curran, *Bull. Amer. Ass. Petrol. Geol.* **41**, 2114 (1957).
5. M. Ewing and J. Ewing, *ibid.* **46**, 708 (1962).
6. J. I. Ewing, J. L. Worzel, M. Ewing, *J. Geophys. Res.* **67**, 2509 (1962).
7. M. Ewing, J. L. Worzel, C. A. Burk, *Initial Reports of the Deep Sea Drilling Projects* (Government Printing Office, Washington, D.C., 1969), vol. 1, pp. 3-9.

"Women's Lib"

Arguments for "women's lib" appear in many publications. I can accept the shallow, subjective stuff in other periodicals, but certainly *Science* should publish arguments other than those for equal pay and maternity leave.

How about extended leave to provide offspring with the love, discipline, and care that young mammals need? Surely biologists can describe the needs of mammalian offspring generally, and the needs of man's offspring specifically.

Are certain women (a minority, I am sure) trying to repeal another of nature's laws? Haven't we bought ourselves enough problems by trying to diverge in various directions from the highways nature intended?

Women certainly deserve fair and enlightened treatment; but what should it be? What can it be—without bringing up more children who will become problems for all of us to contend with?

R. G. LYNCH

8121 Stickney Avenue,
Wauwatosa, Wisconsin 53213

Bureaucracy

The publication "Interim Description and guidelines for proposal preparation," sent to me by the National Science Foundation in reply to a letter of inquiry concerning grants under the RANN (Research Applied to National Needs) program, must represent a new high in the bureaucratization of science funding.

Even after an initial letter of inquiry, with a general description of the contemplated research, it is still necessary to submit a preliminary proposal. This preliminary proposal itself imposes formidable requirements, including an

abstract, narrative (containing a "discussion of the implications of the proposed research for national needs or societal problems"), research plan, management plan (including "a schedule indicating major accomplishment milestones foreseen in achieving the research objective"), related programs and activities of the organization, related programs in other organizations, dissemination of research results ("It is particularly important to identify the potential beneficiaries or users of the anticipated research results and to plan for effective information transfer to them..."), as well as the usual vitae and bibliographies, current support, applications to other federal agencies, and budget. However, this preliminary proposal is still to be treated only as a basis for discussion regarding the development of a formal proposal if "review indicates that the project would be a strong competitor for support by the RANN program."

Aside from the demands on the researcher's time imposed by this excessively cumbersome procedure, are not national needs likely to change considerably before the research gets done? An accelerated, rather than prolonged, application period would seem to be a more logical way to get at urgent societal problems.

MEYER CHESSIN

Department of Botany,
University of Montana,
Missoula 59801

Courtesy

All those except hermits are probably aware of the current crises in job openings and funding. May I call attention to a concomitant, perhaps resultant, crisis in courtesy—courtesy among educational institutions.

Many colleges respond to job inquiry letters with Silence. If this is not an extreme in rudeness and discourtesy, it is certainly at least a failure to empathize with the job-seeking individuals in a poor job market.

Some may suggest an economic justification for this silence, but when \$6 for postcards plus a little time for printing a form letter saying "No, thank you" could relieve some of the anxieties of 100 applicants, the economic argument seems difficult to accept.

L. G. SILVERSMITH

22 Harding Terrace,
Morristown, New Jersey 07960

NEW BOOKS FROM VAN NOSTRAND REINHOLD

BIMOLECULAR LIPID MEMBRANES

By Mahendra K. Jain. Presents the conceptual framework for bimolecular membrane phenomena, emphasizing functions associated with biomembranes. Discusses membrane properties in terms of known laws of physics and chemistry. Describes simple properties of lipid bilayer membranes and progresses to more complex electrical, active and transport phenomena. 480 pp., illus., 6 x 9, \$22.50

THE ENCYCLOPEDIA OF GEOCHEMISTRY AND ENVIRONMENTAL SCIENCES

Edited by Rhodes W. Fairbridge. 20,000 alphabetically arranged articles written by distinguished specialists from widely diverse areas of physical science. Brings rapid, accurate answers to your questions concerning our planet's chemistry and compositional evolution. 1344 pp., 542 illus., 7 x 10, \$49.50

PRINCIPLES AND TECHNIQUES IN PLANT VIROLOGY

Edited by C. I. Kado & H. O. Agrawal. From methods and concepts of inoculation and transmission of virus, this book proceeds into biological behavior of the viruses, bringing you techniques for isolating, purifying and characterizing them. 688 pp., illus., 6 x 9, \$29.50

BIOPHYSICS AND PHYSIOLOGY OF EXCITABLE MEMBRANES

Edited by William J. Adelman, Jr. Various approaches to studying membranes of the nervous system. Includes voltage clamp techniques; modeling concepts as they apply to any field of science; analytic approaches used in X-ray crystallographic analysis of lipid films; and computer reconstruction of membrane currents and nerve impulse. 528 pp., 190 illus., 6 x 9, \$24.50

—FREE 10-DAY EXAMINATION—

Van Nostrand Reinhold Co.
300 Pike Street, Cincinnati, Ohio 45202

Please send me a copy of the book(s) I have checked below for a 10-day free examination. At the end of this time I will remit for the book(s) I keep plus a few cents for delivery costs, or return the book(s) and pay nothing.

☐ Jain, BIMOLECULAR LIPID MEMBRANES (F4086-0006) \$22.50

☐ Fairbridge, THE ENCYCLOPEDIA OF GEOCHEMISTRY AND ENVIRONMENTAL SCIENCES (F5642-9984) \$49.50

☐ Kado & Agrawal, PRINCIPLES AND TECHNIQUES IN PLANT VIROLOGY (F4207-0002) \$29.50

☐ Adelman, BIOPHYSICS AND PHYSIOLOGY OF EXCITABLE MEMBRANES (F0264-0000) \$24.50

Name _____

Address _____

City _____

State _____ Zip _____

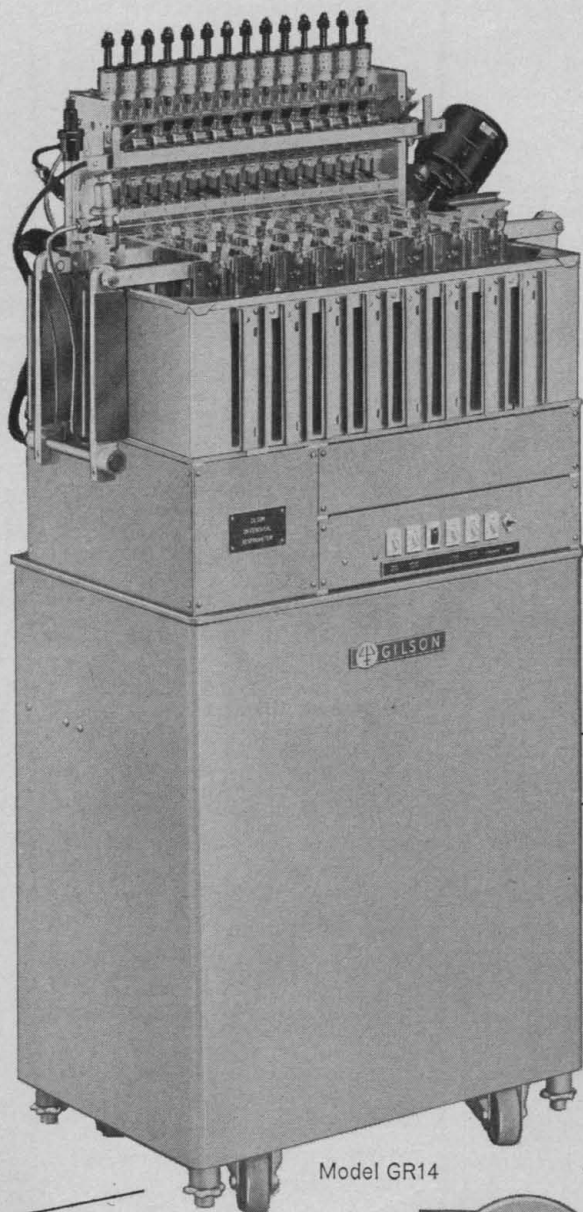
SAVE! Enclose payment with order and publisher pays shipping and handling. Same return-refund guarantee. Add local sales tax where applicable.

Prices subject to change. S-1072

DON'T CALIBRATE!

rotate

and complete
an experiment
in the time
it formerly took
to set up



Model GR14



**VOLUME-COMPENSATED
DIFFERENTIAL
RESPIROMETER**

with
DIGITAL READOUT
in
NUMBERS of MICROLITERS

A calibrated micrometer returns the manometer fluid to its balanced position by movement of a piston in the enclosed volume. This obviates the need for calibration of glassware and simplifies calculations.

EXPERIMENTS under AIR:

Standard models connect the active flasks and one reference flask to stationary volumeters by means of capillary Tygon®* tubing. (Not applicable for use with gases which pass through Tygon.)

**EXPERIMENTS under
100% Oxygen, Hydrogen, CO₂, etc.**

All glass differential manometers with a reference flask for each active flask to eliminate gas penetration. Fewer stations per unit.

WRITE FOR MAIL!

GILSON MEDICAL ELECTRONICS
Middleton, Wisconsin 53562
or telephone: 608/836/1551

*Tygon is the registered trademark
of the U.S. Stoneware Company

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

1972

ALFRED BROWN	FRANK PRESS
JAMES F. CROW	FRANK W. PUTNAM
THOMAS KUHN	WALTER O. ROBERTS
ELLIOTT W. MONTROLL	

1973

H. S. GUTOWSKY	GARDNER LINDZEY
ARTHUR D. HASLER	RAYMOND H. THOMPSON
RUDOLF KOMPFFNER	EDWARD O. WILSON
DANIEL E. KOSHLAND, JR.	

Editorial Staff

Editor

PHILIP H. ABELSON

Publisher

WILLIAM BEVAN

Business Manager

HANS NUSSBAUM

Managing Editor: ROBERT V. ORMES

Assistant Editors: ELLEN E. MURPHY, JOHN E. RINGLE

Assistant to the Editor: NANCY TEIMOURIAN

News and Comment: JOHN WALSH, DEBORAH SHAPLEY, ROBERT GILLETTE, NICHOLAS WADE, CONSTANCE HOLDEN, BARBARA J. CULLITON, SCHERRAINE MACK

Research News: ALLEN L. HAMMOND, WILLIAM D. METZ, THOMAS H. MAUGH II, JEAN L. MARK

Book Reviews: SYLVIA EBERHART, KATHERINE LIVINGSTON, KATHRYN MOUTON

Cover Editor: GRAYCE FINGER

Editorial Assistants: MARGARET ALLEN, ISABELLA BOULDIN, BLAIR BURNS, ELEANORE BUTZ, ANNETTE DIAMANTE, MARY DORFMAN, JUDITH GIVELBER, CORRINE HARRIS, OLIVER HEATWOLE, CHRISTINE KARLIK, MARSHALL KATHAN, MARGARET LLOYD, DANIEL RABOVSKY, JEAN ROCKWOOD, PATRICIA ROWE, LEAH RYAN, JOHN SCHAUER, LOIS SCHMITT, YA LI SWIGART, ALICE THEILE

Guide to Scientific Instruments: RICHARD SOMMER

Membership Recruitment: LEONARD WRAY; Subscriptions: BETTE SEEMUND; Addressing: THOMAS BAZAN

Advertising Staff

Director

EARL J. SCHERAGO

Production Manager

PATTY WELLS

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: John P. Cahill, Room 2107, 919 N. Michigan Ave. (312-DE-7-4973); BEVERLY HILLS, CALIF. 90211: Winn Nance, 111 N. La Cienega Blvd. (213-657-2772)

EDITORIAL CORRESPONDENCE: 1515 Massachusetts Ave., NW, Washington, D.C. 20005. Phones: (Area code 202) Central Office: 467-4350; Book Reviews: 467-4367; Business Office: 467-4411; Circulation: 467-4417; Guide to Scientific Instruments: 467-4480; News and Comment: 467-4430; Reprints and Permissions: 467-4483; Research News: 467-4321; Reviewing: 467-4440. Cable: Advancesci, Washington. Copies of "Instructions for Contributors" can be obtained from the editorial office. See also page xv, *Science*, 29 September 1972. ADVERTISING CORRESPONDENCE: Room 1740, 11 W. 42 St., New York, N.Y. 10036. Phone: 212-PE-6-1858.

Latin American Aspirations

The great disparities among standards of living in the world during the 1950's and 1960's touched the consciences of many people, and foreign aid programs, such as that of the United States, were politically feasible. The passage of time has eroded popular support and, correspondingly, the national commitment has diminished. The reality of widespread poverty remains. If the poorer countries are to develop, they must do so largely by their own efforts. The example of Japan, with its very limited resources, makes it clear that effective use of science and technology is crucial to, and can facilitate, development.

This example has not been lost on leaders of Latin America. For example, the presidents of the American republics, at a meeting held in Punta del Este in April 1967, sounded the hopeful note that "Latin America will share in the benefits of current scientific and technological progress so as to reduce the widening gap between it and the highly industrialized nations in the areas of production techniques and of living conditions."

In May 1972, another meeting sponsored by the Organization of American States was held, this time in Brasilia. This was a Conference on the Application of Science and Technology to Latin American Development (CACTAL). A report on the conference* provides a comprehensive outline of the many legitimate aspirations of our southern neighbors.

"... scientific and technological policies must be geared to the permanent objectives of economic growth, social justice and enhancement of culture."

"The objectives . . . should include narrowing the technological gap, eliminating technological dependence on the developed countries and advancing toward the creation of indigenous technologies."

"Scientific and technological development . . . should give preferential attention to the needs of both rural and urban marginal sectors and to the development of the most dynamic sectors of the economy that make intensive use of advanced technologies."

This is only a small sample of their aspirations. A reality is that in Latin America there are a total of only 50,000 scientists and engineers (a few percent of the number in the United States). Moreover, scientists are not effectively employed in industry. If the Latin American countries are to make substantial progress toward the fulfillment of their aspirations, they must succeed in bringing to bear on the task much larger intellectual and other resources than have heretofore been employed.

One method is to utilize outside resources: for example, the transfer of technology through foreign investment. The CACTAL report seems to restrict that avenue, for it recommends restrictions on the operations of foreign firms that those firms would be reluctant to accept.

The Latin American countries might try to utilize some of the bounteous resources of scientists and engineers in developed countries. This would require an unprecedented degree of cooperation on the part of the Latin Americans and a willingness to provide conditions that would permit effective tackling of problems. On their part, scientists and engineers are by inclination problem-solvers, and many of them would be greatly attracted by new challenges. At the June 1973 AAAS-CONACYT meeting in Mexico City, many matters vital to Latin America will be discussed—among them, technology transfer. The occasion might well serve as a crossroads where problems and problem-solvers get together.—PHILIP H. ABELSON

* Specialized Conference on the Application of Science and Technology to Latin American Development, *Final Report* (General Secretariat, Organization of American States, Washington, D.C., 1972).

That's all there is to it, so send your entry today! It will be judged by an impartial panel, and the awards will be made March 1, 1973. Be sure to name your Baker distributor salesman . . . he can be a winner, too.

I find the actual lot analysis on the 'Baker Analyzed'® Reagent label important in my critical work because . . . _____

[illegible]

My distributor salesman is _____

Name	College
------	---------

Address _____

City _____ State _____ Zip _____

Contest void where prohibited by law and limited to residents of the United States. All entries become the exclusive property of J. T. Baker Chemical Co.

