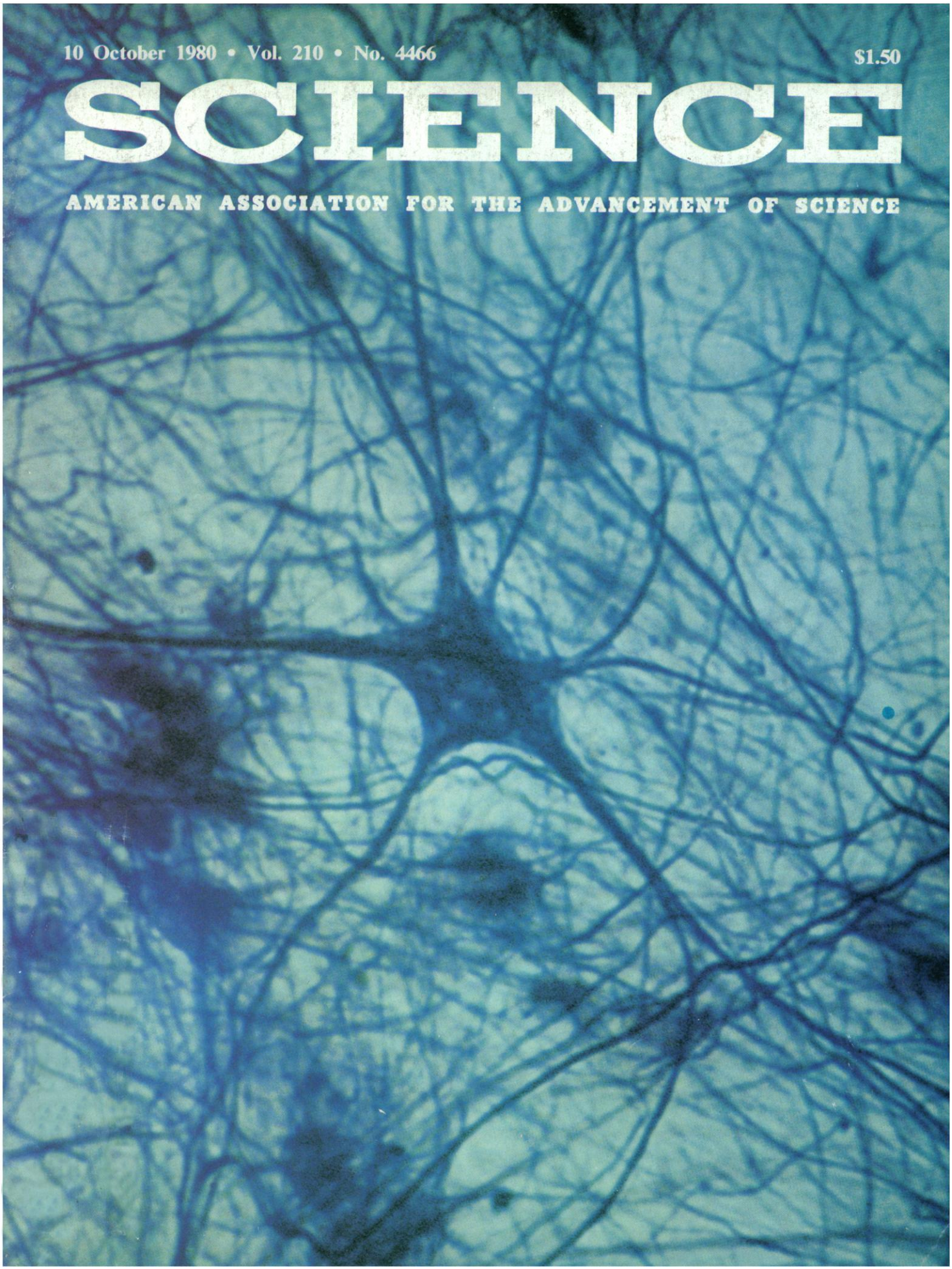
10 October 1980 • Vol. 210 • No. 4466

$1.50

SCIENCE

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



Four years ago, we introduced the first quiet large-volume refrigerated centrifuge — the J-6. Today, no centrifuge matches the degree of reliability established by the J-6 and the current model J-6B. No other centrifuge of its type is UL listed. And no other is so appreciated for its quiet operation and its many features.

The J-6B is built for constant use. Its powerful DC motor gets rotors to speed fast, and its efficient braking cuts run times. The sturdy, proven rotors spin up to 6 liters or 6 blood bags. Color-coded Multi-Disc™ adapters hold large numbers of different sized tubes. The unique JR-3.2 rack rotor holds fully loaded gamma counter racks; a new Elutriator rotor provides a gentle means of separating cells. There's even a special model — the J-6B/P centrifuge — for blood component processing; it has automatic reset timer, optical calibration port, two-step braking, and end-of-run indicators.

And, should you ever require service, it's only a phone call away because there are over 400 Beckman Service Representatives in the U.S. and Canada alone.

For full information, write Spinco Division, Beckman Instruments, Inc., 1117 California Ave., Palo Alto, CA 94304.

BECKMAN

Circle No. 126 on Readers' Service Card

What to look for in a lab balance.

QUALITY you can feel whenever you operate a switch, slide a poise.

PRECISION you can see every time you make a weight determination.

CONVENIENCE you'll appreciate in time savings, ease of use, simplicity of operation.

JOB SUITABILITY — you can choose from a wide selection of over 60 models — without compromise.

RELIABILITY you can depend on, day after day, even under severe conditions.

VALUE — you know it when you see it. That elusive combination of all of these benefits — at a price you can afford. There's one sure way to get it all.

ASK FOR OHAUS.

OHAUS®
Ohaus Scale Corporation
29 Hanover Road, Florham Park, N.J. 07932
(201) 377-9000

44-100

☐ Please send me the complete Ohaus catalog of over 60 different models of balances for the laboratory.

☐ Please have a representative arrange a no-obligation demonstration. I'm particularly interested in _____ My phone number: ( ) _____

Name _____ Title _____

Organization _____

Address _____

City _____ State _____ Zip _____

My application is _____

A. Ohaus Dial-O-Gram® Model 1650 balance — 2610 g x 0.1 g B. Ohaus Dial-O-Gram® Model 310 balance — 310 g x 0.01 g
C. Ohaus Model 300 electronic balance — 300 g x 0.01 g D. Ohaus Harvard Trip Model 1550 SD balance — 2000 g x 0.1 g

Circle No. 101 on Readers' Service Card

ISSN 0036-8075

10 October 1980

Volume 210, No. 4466

SCIENCE

SCIENCE is published weekly on Friday, except the last week in December, by the American Association for the Advancement of Science, 1515 Massachusetts Avenue, NW, Washington, D.C. 20005. Second-class postage (publication No. 484460) paid at Washington, D.C., and at an additional entry. Now combined with **The Scientific Monthly®**. Domestic individual membership and subscription (51 issues): $38. Domestic institutional subscription (51 issues): $76. Foreign postage extra: Canada $14, other (surface mail) $17, air-surface via Amsterdam $45. First class, airmail, school-year, and student rates on request. Single copies $1.50 ($2 by mail); back issues $2.50 ($3 by mail); classroom rates on request. **Change of address:** allow 6 weeks, giving old and new addresses and seven-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* and in several specialized indexes.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

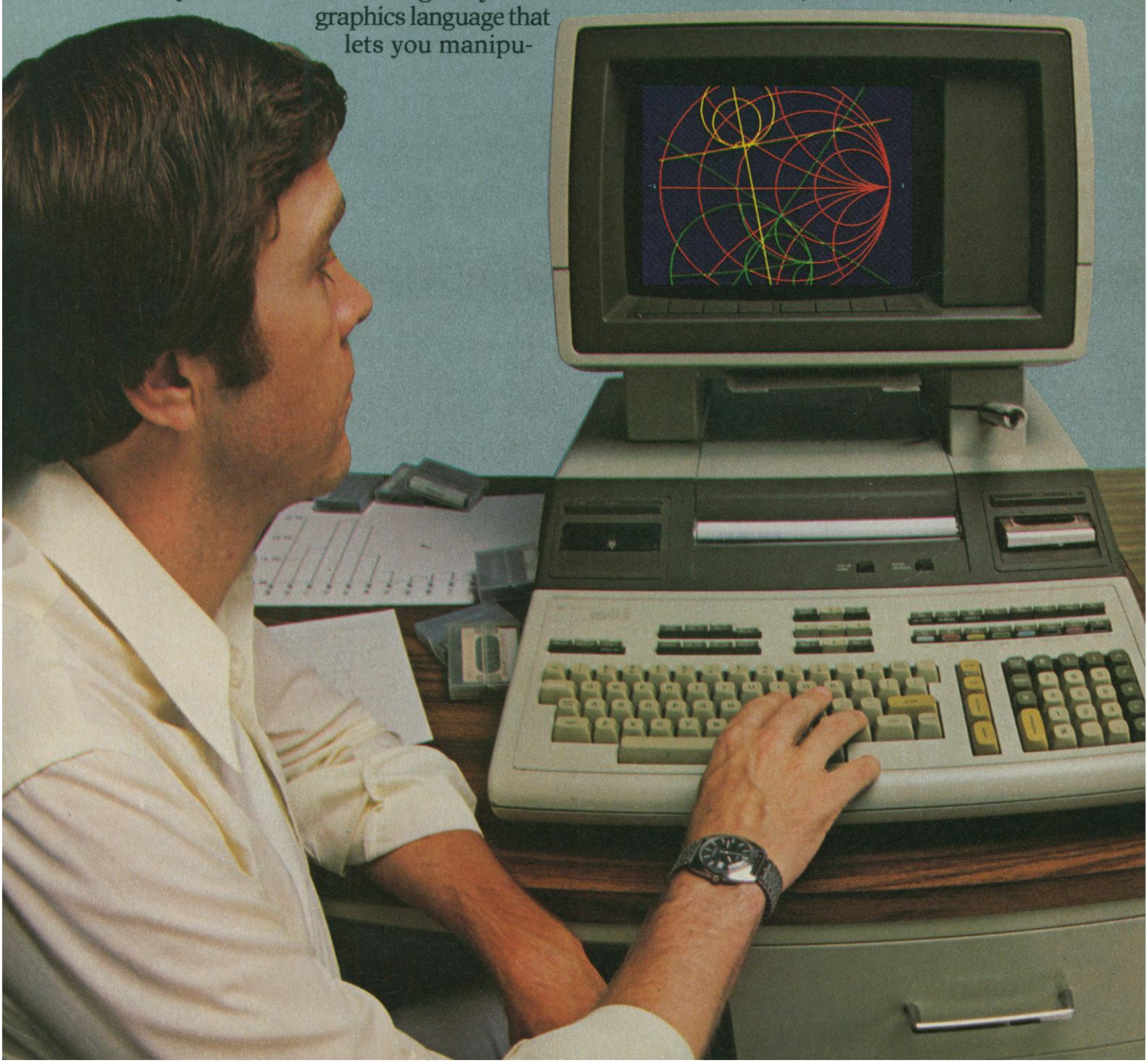
Photomicrograph of a mature multipolar neuron surrounded by axonal and dendritic processes of additional neurons in a 22-day-old explant culture of mouse cephalic tissue taken at 11 days' gestation (stained by silver-impregnation method of Bodian, about × 750). See page 190. [J. Sotelo *et al.*, National Institutes of Health, Bethesda, Maryland]

Graphics on the powerful computers: a fast way

Today's complex computation and design tasks call for some very sophisticated graphics tools to help you peer into the heart of a problem. At HP, we build most of these capabilities right into our Series 9800 desktop units.

For example, our top-of-the-line Series 9800 System 45C includes a greatly enriched graphics language that lets you manipulate 4,913 shades of color with remarkable ease. A light pen and high-performance digitizer give you flexible options for entering data. And 3-D rotations allow you to view objects on the CRT from any desired angle.

For monochromatic applications, the Systems 45B and 35, as well as our new, low-cost



HP Series 9800 desktop to focus on the facts.

HP 85, also provide advanced graphics software. And when you add an input peripheral and our four-color plotter, you've got a full-function graphics workstation—a completely integrated computing system that operates under your own personal control.

Power you can get your hands on.

To compliment this graphics capability, a powerful data base management package on the disc-based System 45 models lets you store, retrieve, sort, modify and analyze large amounts of technical data—quickly and efficiently. User-addressable memories to 449K bytes give you plenty of room for complex manipulations. And hooking up to measuring instruments is a simple matter of choosing from among four protocols available: HP-IB, Bit-Parallel, BCD or RS-232-C.

As friendly as ever.

Even with major increases in power and graphics capabilities, HP desktop computers retain the easy-to-use features that have always been their hallmark. These include simplified programming in our HP Enhanced BASIC language (or optional assembly language on some models); built-in operating systems that let you start solving problems as soon as you turn the computer on; and reliable, low-maintenance operation.

Plenty of room for growth.

If your applications require a larger data base, you can link your desktop computer to our powerful HP 1000 or HP 3000 minicomputer systems (and to non-HP computers as well). Communication is easily managed—both async and bisync protocols are available—and, by combining the relative strengths of desktops and minis, you get a remarkable degree of flexibility for processing scientific, engineering, and managerial information.

If you'd like to find out more about how HP Series 9800 desktop computers can help improve your engineering productivity, just contact your local HP sales office listed in the White Pages. Or write for more information to Hewlett-Packard, Attn: Pete Hamilton, Dept.3585,3404 East Harmony Road, Fort Collins, CO 80525.

HEWLETT PACKARD

Circle No. 173 on Readers' Service Card

37004 HPDC9

MINC lets you spend less time gathering data and more time using it.

Set up a MINC computer in your lab. Connect your instruments. Run your experiments. Suddenly, you'll notice you've got extra time. Time you never had before.

Time to manage. Time to interpret. Time to conceptualize, theorize, extrapolate. Time to make good use of all that data you once spent so much time collecting.

That's the value of MINC: the Digital family of convenient, inexpensive laboratory computer systems.

MINC is designed specifically for scientific use. It interfaces easily with lab equipment. It has the versatility to perform a wide variety of research tasks. And it comes with graphics display, plug-in input/output modules, and easy-to-use, ready-to-run software routines. So even if you've never used a computer before, you can have MINC fully integrated into your lab with a minimum of training and start-up time.

Of course, with MINC, you get a lot more than just time. You get the service, resources, and reputation of Digital, the undisputed leader in laboratory computers. Now MINC is available with the powerful Digital PDP-11/23 microcomputer. Which means it's more than just reliable. It's compatible with most other Digital computers. As your lab grows, this extensive compatibility assures you that your investment in Digital equipment is always protected.

There are now three MINC computer systems to choose from, priced from $9,900 to $30,900.* A Digital Laboratory Data Products representative can tell you all about them. You'll see just how easy it is to bring a MINC into your lab. And just how valuable a tool it can be.

MINC. For the work it does. And for the time it spares you.

TO: Digital Equipment Corporation
Laboratory Data Products Group MR 2-4/M 16
One Iron Way, Marlboro, Mass. 01752
(617) 467-5869

European headquarters: 12 av. des Morgines, 1213 Petit-Lancy/Geneva.
In Canada: Digital Equipment of Canada, Ltd.

Yes, maybe we can be using our time more effectively. Tell me more about MINC.

Name_____

Title_____

Organization_____

Address_____

City_____

State_____ Zip_____ Phone_____

Sci 10/10/80 D-X397

*Prices apply in U.S.A. only. MINC (Modular INstrument Computer) is a trademark of Digital Equipment Corporation.

digital

Lanier introduces the No Problem™ typewriter for your technical typing.

Want to get your typing back faster than ever before? **NO PROBLEM**

Want to type Greek and math symbols right on the screen? **NO PROBLEM**

Want to type and edit multi-level equations with typewriter simplicity? **NO PROBLEM**

Want to add line drawings and charts to the page? **NO PROBLEM**

Most typewriters—even many of the latest electronic models—are limited to basic typing.

But the Lanier No Problem Electronic Typewriter is multi-use, with extraordinary powers for technical and scientific typing.

No Problem typing—a better way to type.

The No Problem concept

To begin with, the No Problem typewriter speeds up the typing of your proposals, manuals, and reports like no ordinary typewriter can.

It eliminates typing rough drafts on paper. Pages are prepared on a TV-like screen instead.

Changes and corrections are made right on the screen. So no whiteouts. No retyping. No false starts. Whole paragraphs can be moved with the touch of a few keys.

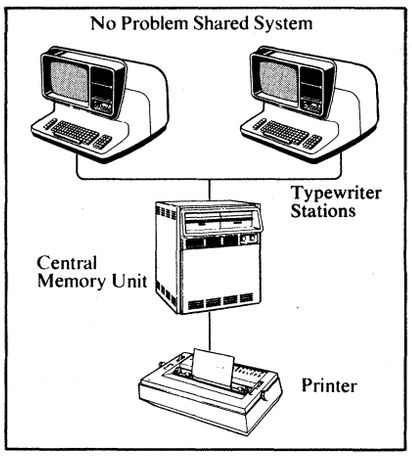
Letter quality printing is done at up to 540 words per minute.

With the No Problem typewriter, one typist can now do work as fast as 3 or 4 people using ordinary electric typewriters.

Plus, the basic intelligence for the No Problem typewriter is contained on No Problem Smart Discs.™ So future functions and improvements can be added with new Smart Discs as they are developed.

One typewriter or a shared system

The No Problem Shared System™ offers you even greater typing capabilities.



The No Problem Shared System™ adds new capabilities to the already versatile No Problem concept.

The heart of the system is the Central Memory Unit. It can store up to 30,000 pages, giving you lower storage costs per page, and eliminating the need for typists to handle numerous discs.

You can start with one or two typewriter stations connected to the Central Memory Unit, and add typewriter stations or printers as your needs increase.

There is also an attractive economic factor in sharing printers and other equipment.

Advanced features

Consider the old method of incorporating complex mathematical equations into your copy: leave the space blank, then hand letter them in after the page was typed. Or, you could run to the photocopier, then "cut and paste."

With the No Problem Shared System, you can incorporate *and edit* virtually any equation you may encounter—*right on the screen.* It will display *256 different characters,* including Greek and math symbols.

Line drawings can be constructed on the No Problem screen, too.

The No Problem Shared System automatically selects left, right or center page position for numbers, and chapter names on even and odd pages. Repagination automatically updates section numbers to accommodate your additions and deletions.

Advanced editing automatically positions footnotes on the proper page.

And the printing of the No Problem Shared System approaches typeset quality and flexibility. Proportional and bold printing, to fit any format or width, is easily done. Even in two typestyles and two colors on the same page at the same time.

Most of all, the No Problem Shared System can improve your cost/performance ratio dramatically with its increased workpower.

Modular design protects your investment

You can add Shared System typewriter stations, standalone No Problem typewriters, printers and Smart Discs to your office at will.

So your investment will *continue* to be a money-making problem solver as long as you own the equipment.

The No Problem demonstration

Your Lanier representative won't waste your time with a memorized sales pitch.

We would rather show you how No Problem typing can solve *your* problems.

Send us this coupon and we'll call immediately to set up an appointment. Or call toll free **(800) 241-1706.**

Except in Alaska or Hawaii. In Georgia, call collect (404) 321-1244.

The No Problem Electronic Typewriter from LANIER®

LANIER BUSINESS PRODUCTS, INC.

It does more than just type.

Want to see Lanier No Problem typing in action? NO PROBLEM.

Send us the information below and a Lanier representative will call for an appointment.

Name_____ Title_____

Phone_____

Best Time To Call_____

Firm Name_____

Address_____ County_____

City_____ State_____ Zip_____

What kind of typing or word processing system are you using now?_____

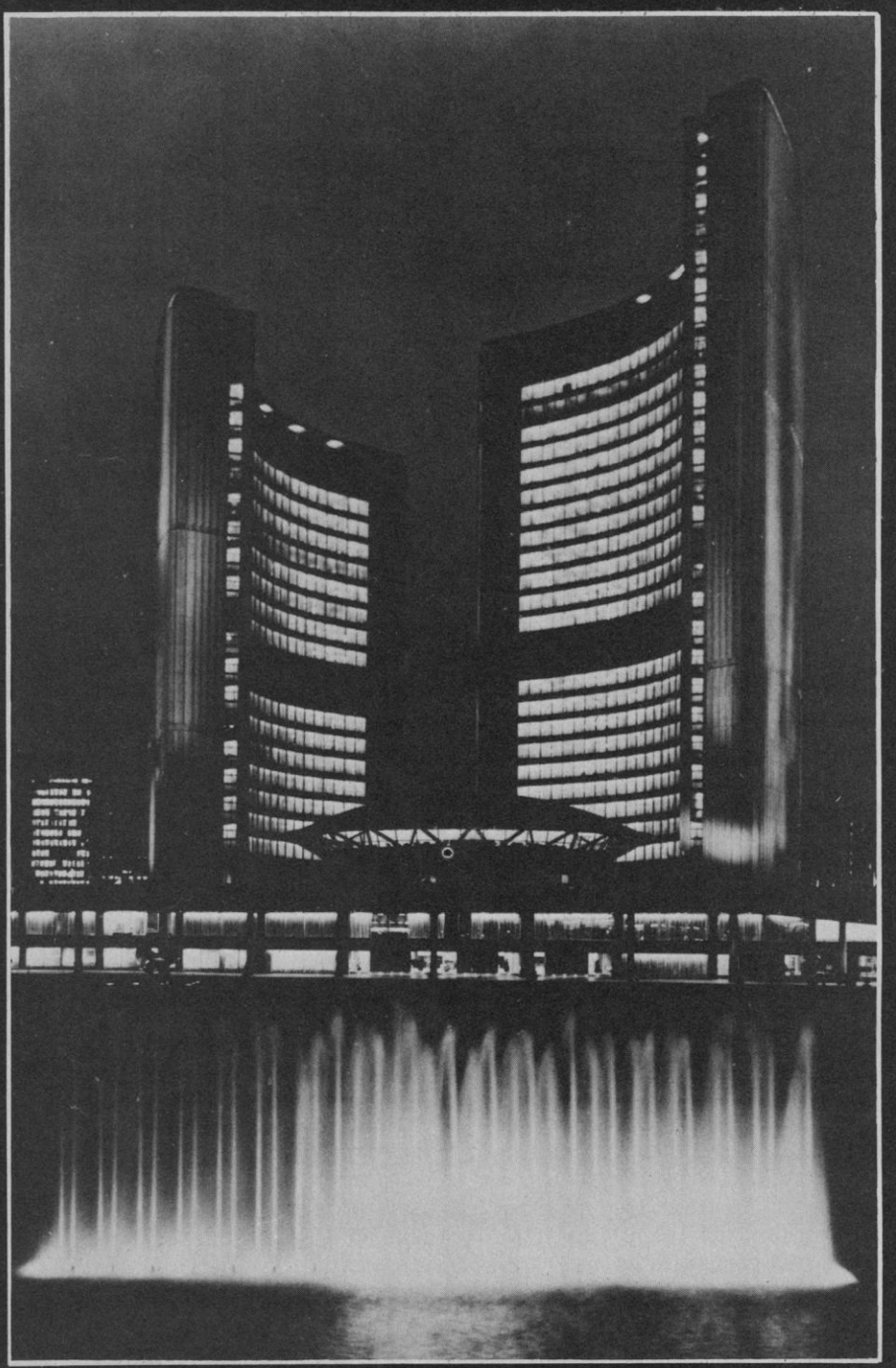
Lanier Business Products, Inc.
1700 Chantilly Dr. NE, Atlanta, GA 30324

Circle No. 168 on Readers' Service Card

Science and Technology: Bridging the Frontiers

toronto

Symposia
Exhibits
Science Film Festival
Poster Sessions
Tours
Youth Activities



For details about the Meeting program, as well as housing and registration forms, see the Preliminary Program issue of Science 12 September 1980

or write

AAAS Meetings Office
1776 Massachusetts Avenue, N.W.
Washington, D.C. 20036

aaas

AAAS Annual Meeting and Exhibit
Toronto, Ontario, Canada
3-8 January 1981

FOR TODAY'S FACULTY AND COLLEGE STAFF MEMBERS* FROM 18 TO 80.

Whether you're thinking retirement or not, review the plan that provides for cash withdrawal (without surrender charge) and/or a lifetime income.

TIAA-CREF Supplemental Retirement Annuities (SRAs) offer you substantial flexibility including cash withdrawal and/or lifetime retirement income. You can even reduce your income taxes now!

You can begin contributions to an SRA at any age and begin benefits at any age up to age 71 unless you are still employed (then you can delay beginning benefits until age 80). For example, you could start contributions at age 25, and choose to begin benefits or withdraw cash at age 34, 40 or 50, regardless of your employment status.

Get your money at any time.

You can receive benefits as a lifetime income or over a fixed period of from 2 to 10 years. What's more, if you need it (even while employed by your current employer), you can withdraw all the money you have accumulated by surrendering your contracts. Or, you can withdraw $1,000 or more every six months. There is never a cash surrender charge.

Contributions are tax-deferred, so you pay less income taxes now.

The federal income tax on your contributions is deferred until they are paid to you as benefits. So, you pay less tax now.

Changing employers? Take SRAs with you.

Since you own your Supplemental Retirement Annuities, you take them with you if you leave your current employer. You can make contributions through any institution that makes Supplemental Retirement Annuities available to staff members. Contributions can be as little as $25 a month.

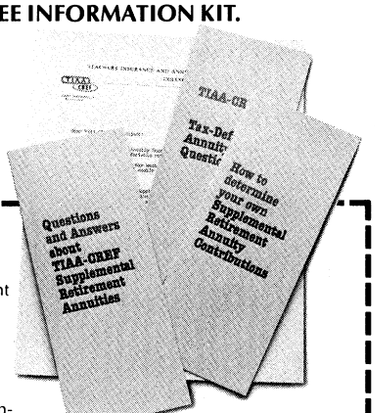
Full information.

Complete and mail the coupon for an SRA Information Kit today. You'll get full details about all the advantages SRAs have to offer, why this plan suits so many financial situations and age groups and how much you may contribute to the plan.

*TIAA-CREF provides annuities and other services for employees of colleges, universities, private schools and certain other nonprofit tax-exempt educational and research institutions.

HELP YOURSELF TO A BRIGHTER FINANCIAL FUTURE ...SEND FOR A FREE INFORMATION KIT.

TIAA CREF



Teachers Insurance and Annuity Association of America—College Retirement Equities Fund
730 Third Avenue
New York, N.Y. 10017

Please send me full details about TIAA-CREF Supplemental Retirement Annuities, the flexible tax-deferred annuity plan that offers the opportunity to accumulate funds for additional retirement income and the option for cash withdrawal.

Name_____

Address_____

City_____

State_____ Zip_____ Date of Birth_____

Name of Institution_____

Please let us know if you are participating in a TIAA-CREF retirement plan at your institution. ☐ YES ☐ NO

S-1010-80

The First Truly Automated HPLC System

BY LABORATORY DATA CONTROL

LDC combines the proven reliability and versatility of the Gradient Analyst™ liquid chromatograph with the microprocessor power of the CCM™ Chromatograph Control Module to produce a fully automated HPLC System.

By use of the alphanumeric keyboard and easy-to-read 9" CRT screen the user can enter and store up to 110 LC parameter files for unattended methods development. The CRT allows file setup with prompting and use of the ROM resident BASIC even during chromatography. Pumping conditions, detector wavelength and attenuation, and autoinjector control are entered using plain English commands. What's more, the CCM can simultaneously integrate and plot 2 channels of data on its 2 pen printer/plotter. And, the magnetic tape memory can save anything (or everything) for later recall and use.

Ask now for detailed specifications to automate your HPLC laboratory with the LDC Analyst-CCM System - today's truly complete microprocessor based liquid chromatograph.

LDC LIQUID CHROMATOGRAPHS

LABORATORY DATA CONTROL, DIV. OF MILTON ROY CO.
P.O. Box 10235, Riviera Beach, Florida 33404
Tel: (305) 844-5241 Telex: 513479

Circle No. 3 on Readers' Service Card

LETTERS

Cryptography Research Funding

I believe it is necessary to correct some misconceptions about the acts of the National Security Agency (NSA) as described in the article "Cryptography: A new clash between academic freedom and national security" (News and Comment, 29 Aug., p. 995).

NSA, as the primary user of cryptography and research in cryptography in the government, is increasingly interested in investing in primary research in cryptography as well as related fields, such as mathematics. Up to now this effort has been by means of entering into contracts with companies and institutions, although we are hoping to expand our efforts to include grants for significant primary research. This effort is meant in no way to supersede or freeze out any other funding mechanisms for research in cryptography.

In particular, although NSA has provided assistance to the National Science Foundation (NSF) for the last few years in evaluating research proposals in cryptographic areas, NSA does not now have and does not intend to seek the authority to prohibit NSF funding in this area. We do hope, however, that NSA will become an increasingly important sponsor of research in this area in addition to other sources of financing currently available.

I anticipate that the results of most of the research funded by NSA will raise no direct questions of national security and could be published and otherwise publicly released. On occasion, because of the nature of cryptographic materials and of the work done by NSA, it may be necessary to classify resulting publications because of their impact on the national security. We are currently working out the procedures for such classification, which I hope would permit sufficient channels of review and appeal to assure the researchers working with NSA that the agency is not acting arbitrarily with regard to classification. Such mechanisms for review and classification are commonplace to anyone who has worked under contracts or grants for the Department of Defense. I have asked Leonard Adleman and Ronald Rivest for their views on how such mechanisms should work, and I would hope that satisfactory procedures can be developed.

B. R. INMAN

National Security Agency, Fort George G. Meade, Maryland 20755

Recent articles in *Science* about the potentially chilling effect of prior restraint on cryptographic and related research fields suggest impacts that could extend far beyond the comparatively narrow concerns of security, federal research funding, and academic tenure. One commentator is quoted (29 Aug., p. 995) as having said he believes a leading NSA figure in the dispute really does not "understand how the university and academic community works." There now may be sufficient cause to wonder if some NSA members understand how security works.

For the sake of argument one could well imagine that another nation's security service would be most pleased to champion the cause of prior restraint on cryptographic research in the United States on the grounds that it would

1) Hamper our scientists' capacity and willingness to undertake some aspects of basic research in such vital areas as mathematics, information science, and artificial intelligence.

2) Decrease the probability that U.S. scientists would appreciate the potential cryptographic significance of scientific work in other countries.

3) Diminish the incentive for research in the private sector by discouraging U.S. computer and communications manufacturers from developing cryptographic hardware and software to meet the growing private demand. This in turn would seriously compromise their ability to compete in international and domestic markets with foreign manufacturers who would be unrestricted by NSA policy. Conceivably, NSA might soon have to purchase its own cryptographic hardware from, say, Japanese manufacturers.

4) Perpetuate an anachronism of the 19th-century diplomacy of sealed royal letter boxes whose keys are worn around the necks of foreign ministers. Restricting cryptographic traffic and methodology to a security elite serves only to narrow sharply the focus of would-be interceptors and decipherers.

It is unfortunate that, in the extensive literature on cryptography, security, privacy, and related matters, surprisingly little appreciation is shown for the potentially positive applications of these functions. Only recently, through advances in electronic computation and communication, has it been feasible to explore the rewarding applications of truly anonymous information-gathering: protecting the rights of experimental subjects; facilitating anonymous peer review; enhancing scientific communication; and pre-

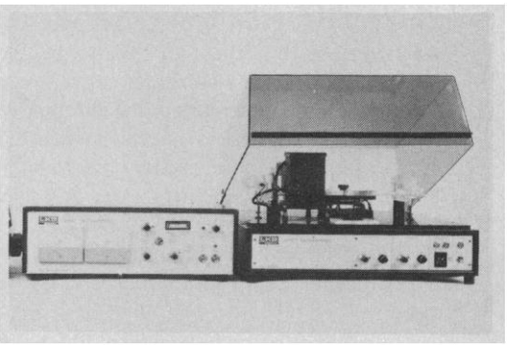
Isotachophoresis - forget the theory and look at the results

The LKB Tachophor

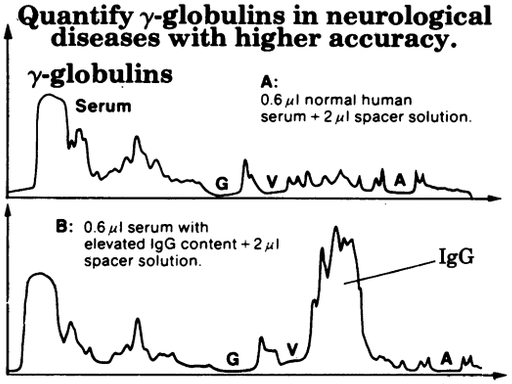
This instrument has turned a complicated technique into simple practice. Yet in spite of its simplicity of operation, it offers you greater possibilities for experimenting with your samples than many other separation systems. As you can see, the results are excellent.

Some of these results can only be achieved by using this technique.

If you are interested in practical results, send for our Tachophor brochure. If you are still interested in the theory, we can supply a very instructive booklet, free of charge.



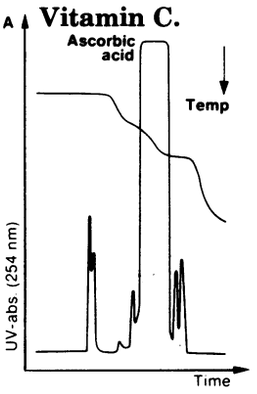
Quantify γ-globulins in neurological diseases with higher accuracy.



Analysis of γ-globulins related to neurological disease as in e.g. Multiple Sclerosis. The speed of assay and provision of quantitative information makes isotachophoresis superior.

Reference
Delmotte, P., Science Tools 24 (1977) 33–41.

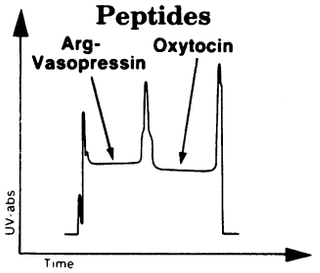
Analyze the sample without pretreatment.



Analysis of vitamin C in 1.6 μl of a commercially-available orange juice; the juice was analysed directly from the container, *without any pretreatment*. Analysis time: 12 minutes! Other acids of interest in the juice can be analysed simultaneously.

Reference
Baldesten, A., Hjalmarsson, S-G and Neumann, G., Fres. Z. Anal. Chem. 290 (1978) 148–149.

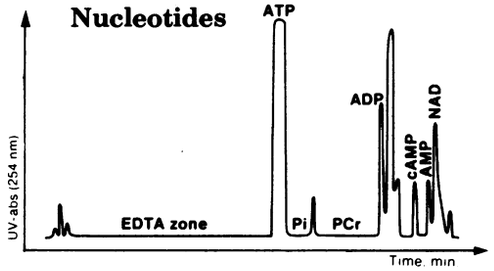
The only simple way of purification of peptides. 10 minutes instead of days.



These two peptides (7 nmoles each) are completely separated in 15 minutes. Several small, naturally-occurring physiologically-active peptides are now prepared for use in medicinal preparations. With isotachophoresis you have a very rapid method for determining the purity of such peptides.

Reference
LKB Isotachophoresis News IN 2 (1977)

Get all nucleotides and other important compounds in one single run.



10 μl methanol extract of frog sartorius muscle. All the nucleotides are analysed and estimated in *one single run*. Analysis time: 20 minutes.

Reference
Gower, D.C. and Woledge, R.C., Science Tools 24 (1977) 17–21.

LKB

LKB-Produkter AB
Box 305, S-161 26 Bromma, Sweden

LKB Instruments Inc.
12221 Parklawn Drive, Rockville, Maryland 20852
Tel: (301) 881-2510

Circle No. 61 on Readers' Service Card

Calibration couldn't be easier...

The new LKB MicroPerpex Pump offers:

- wide range of exactly calibrated flow rates with one simple step
- constant, low pulsation flow
- continuous display
- choice of 1 or 2 pump heads
- microprocessor precision
- easy to mount tubing
- compact design

For the complete range of column chromatography products

LKB

LKB Instruments Inc.
12221 Parklawn Drive, Rockville,
Maryland 20852 Tel: (301) 881-2510

Circle No. 181 on Readers' Service Card

With Mettler there's no wait for accurate weight.

You can get immediate delivery on the best balance value from any of the leading laboratory dealers. Mettler's worldwide distribution system works well. We keep the supply lines moving so that you don't have to wait.

And there's no wait for results in the lab either—because no balance can be operated faster than a Mettler. A single control bar does everything.

Mettler makes a balance for every situation. You can weigh a microgram with 0.1 μg readability or 30,000 grams with 0.1 g readability. DeltaRange®, available in selected Mettler balances, gives you a movable fine range to work with that's 10 times more accurate than the coarse range of the balance. It's a valuable aid when weighing in ingredients of a formula, or when you need to precisely weigh small amounts in large containers.

One of the many nice things about buying a Mettler balance is that the quality isn't only in the balance. It's also in the service that's available quickly from trained Mettler technicians throughout the U.S. That's what makes Mettler a unique value in balances.

Write for our catalog. Mettler Instrument Corporation, Box 71, Hightstown, NJ 08520. Phone: (609) 448-3000

Mettler

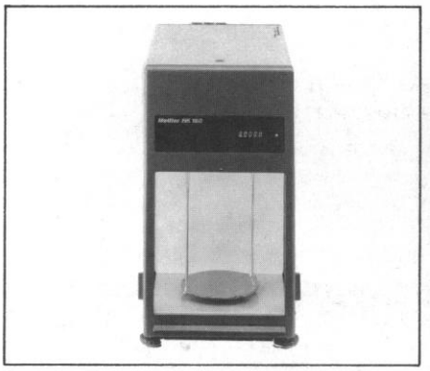
Your work is worth it.

Mettler delivers.
Speed, accuracy and repeatability for all your laboratory needs.

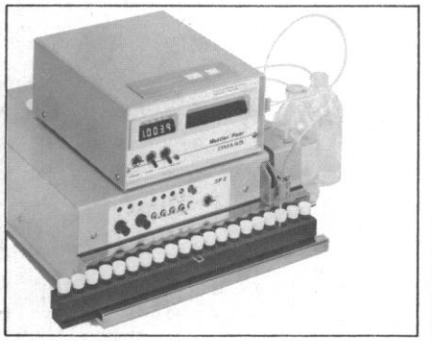
Bench balances. Popular PC Series electronic bench balances include models with capacities from 180 g to 16,000 g. Fine-range precision (DeltaRange®) is available on most models. All operate with a single control bar. They are versatile balances that do a variety of weighing jobs in the lab.

Weighing systems. The ultimate in application versatility, PK Series balances can be connected to peripheral instruments to simplify and speed tasks such as counting, statistical quality control, animal weighing and moisture determination. PK36 and PK4800 balances are equipped with DeltaRange for fine-range resolution.

MemoTitrator. The DL40 MemoTitrator is an automatic titrator that uses advanced microprocessor technology to speed all laboratory titration analyses. It stores up to 10 different reagents, and as many as 19 different assay methods, which can be recalled by keying in the number of the method desired. Does incremental, end point absolute, end point relative and equilibrium titrations. It is also a Karl Fischer titrator, a dispenser, a pH meter, and much more. Most important, it can "learn" methods for you and will suggest the best possible one to use on your new sample.



New HK160 analytical balance. The HK160 incorporates the latest microprocessor technology to help you achieve weight determinations with 0.1 mg resolution. Features a high-speed readout, a built-in automatic calibration device and a three-position integration selector switch. Mettler 03 Data Output is also standard.



Density meters. Unique use of electromagnetic excitation of the sample tube makes every Mettler/Paar Digital Density Meter a breeze to use. Accuracy is unaffected by viscosity or volatility or surface tension of the specimen. Digital results in seconds for density, specific gravity or concentration. Anyone can use it whether skilled or unskilled.

Mail to: Mettler Instrument Corporation, Box 71, Hightstown, NJ 08520

Please send me information on the following products:

☐ Bench balances ☐ Weighing systems ☐ MemoTitrator

☐ HK160 analytical balance ☐ Density meters

Name_____

Company_____

Address_____

City_____ State_____ Zip_____

Phone_____

Mettler

Your work is worth it.

S

INSTRUMENTS OF SUCCESS

Like any scientific instrument, the CA SELECTS® series of current-awareness publications is designed to make you a better scientist.

Choose your topic from more than 100 now available, and CA SELECTS will bring you informative abstracts from the world's scientific literature relevant to your interest.

CA SELECTS Covers More Than Just the Best Journals

CA SELECTS publications are derived from the comprehensive CHEMICAL ABSTRACTS information base, the world's most complete source of abstracts and bibliographic references for chemistry-related journal articles, patents, dissertations, reviews, books, conference proceedings, and other published research.

Receive CA SELECTS every two weeks and you can stop worrying about what you've missed. We monitor more than 14,000 scientific journals to produce this outstanding series: not only the "cream of the crop," but all significant chemistry-related publications.

CA SELECTS Is For Chemists, Physicists, Biologists And Many Others

If your field bears any relation to chemistry, chances are there's a CA SELECTS topic for you.

Ask for your free CA SELECTS catalog today. Then join the thousands of scientific professionals who find timely, convenient current-awareness in their own CA SELECTS subscriptions.

Chemical Abstracts Service
A Division of the American Chemical Society

Circle No. 45 on Readers' Service Card

Mail This Form for Your FREE CA SELECTS Catalog

CA SELECTS

Please send me my free catalog of CA SELECTS topics. I understand there is no obligation to order a subscription.

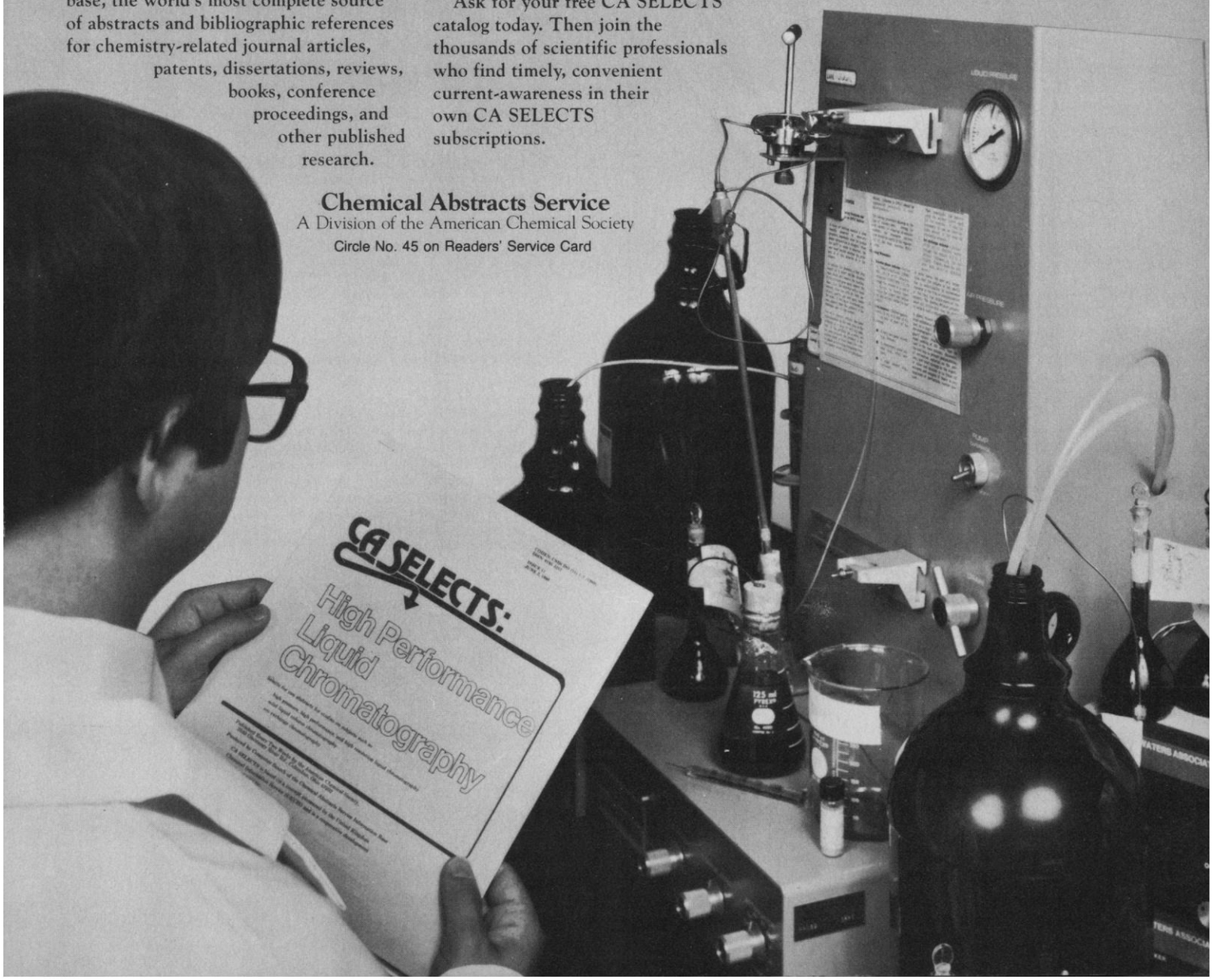
Name

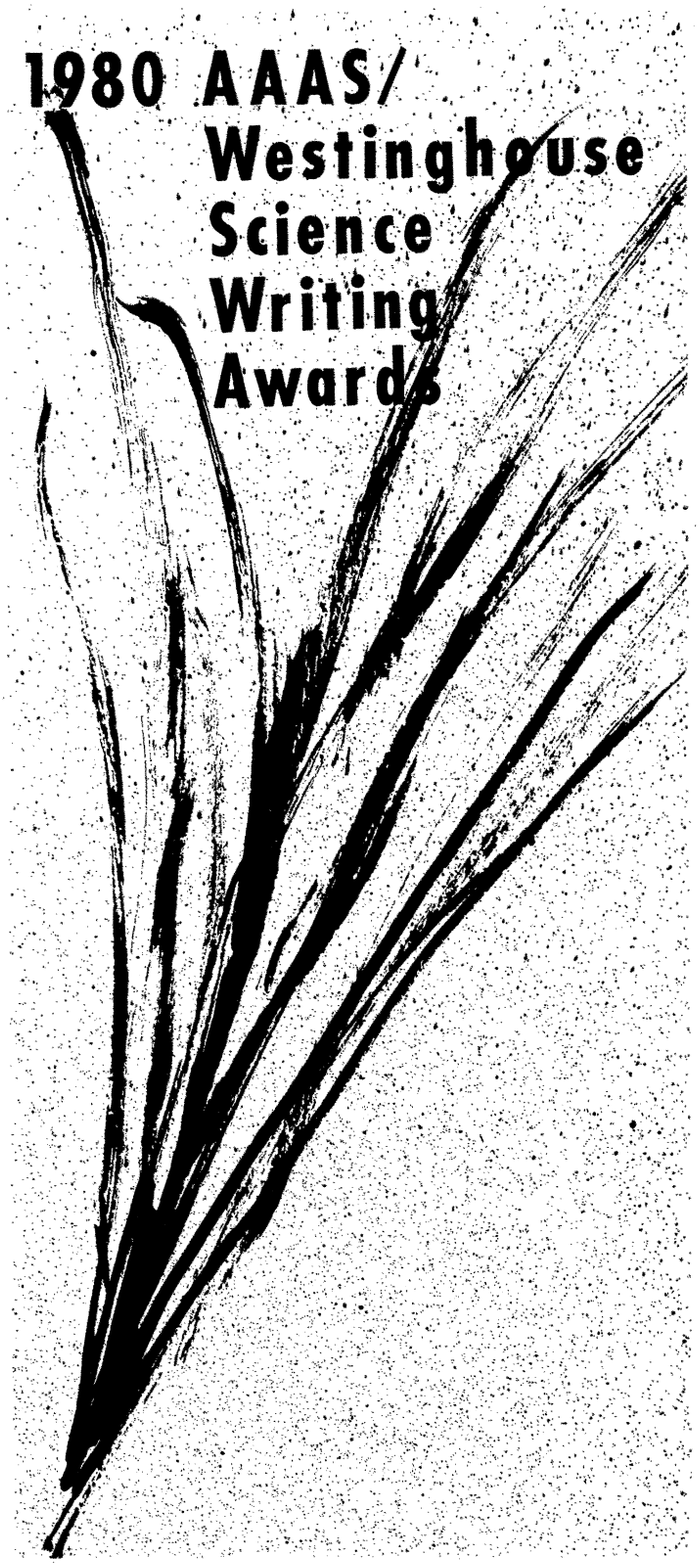
Title

Organization

Address

Mail to:
Chemical Abstracts Service
Marketing Dept. SMA
P.O. Box 3012
Columbus, Ohio 43210





RULES

1) The aim of this competition is to encourage and recognize outstanding writing on the sciences and their engineering and technological application in newspapers and general circulation magazines. The following categories are not eligible: articles on the field of medicine, articles published originally in AAAS publications, articles by employees of the AAAS or Westinghouse Electric Corporation.

2) Each entrant in a newspaper award competition and each entrant in the magazine award competition may submit three entries.

3) An entry for a newspaper competition may be any of the following: a single story; a series of articles; or a group of three unrelated stories, articles, editorials, or columns published during the contest year. A magazine entry may be a single story or series published during the contest year.

4) A completed entry blank must be submitted together with six copies of each entry in the form of tear sheets, clippings, reprints, or syndicate copy (not over 8½" x 11"), showing name and date of the publication. ENTRIES MUST NOT BE ELABORATE.

5) Each entry must have been published in a newspaper or general circulation magazine within the United States during the contest year — 1 October 1979 through 30 September 1980. (In the case of a series, more than half of the articles comprising it must have been published during the contest year.) Date on the issue in which an article appeared will be considered as the date of publication. All entries must be postmarked on or before midnight, 15 October 1980.

6) Persons other than the author may submit entries in accordance with these rules. Entries will not be returned.

7) Winners of the 1979 awards are not eligible for the 1980 awards. Persons winning three times are no longer eligible.

8) The Judging Committee, whose decisions are final, will choose the winners. There are three awards of $1000: for the winning entry in the over-100,000 daily circulation newspapers competition, for the winning entry in the under 100,000 circulation newspapers competition; and for the winning entry in the general circulation magazine competition. For award purposes, newspaper circulation will be sworn ABC daily circulation as of 30 September 1980. The Judging Committee may cite other entries for honorable mention.

9) The awards will be presented at the dinner meeting of the National Association of Science Writers, during the 1980 meeting of the American Association for the Advancement of Science in January 1981. Travel and hotel expenses of the award winners will be paid. Entrants agree that, if they win, they will be present to receive their awards, unless prevented by circumstances beyond their control.

Grayce A. Finger

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

1515 Massachusetts Avenue, N.W. Washington, D.C. 20005

Give it 60 seconds and almost anything that's dry.

The Brinkmann Centrifugal Grinding Mill is designed to quickly break down to a uniform, specific particle-size range most dry materials up to 6.0 Mohs in hardness.

In just 60 seconds, the Mill will reduce 50 g plastic sheet to 100 μm, 50 g corn to 50 μm, or 120 g limestone to 20 μm particles. By selecting the appropriate combination of stainless steel rotor and screen (6-tooth, 12-tooth and 24-tooth rotors, also 24-tooth tungsten carbide rotor; screens with mesh sizes from 0.08 to 6 mm), a desired particle size range down to 40 microns or smaller can be achieved with a wide variety of substances, including minerals, foods, plant fibers, animal tissue, pharmaceuticals and synthetic materials.

The Grinding Mill is equipped with a powerful dual-speed motor (20,000/10,000 rpm), a 60 min. timer, and is easy to empty and clean. It will pulverize volumes from 3 to 500 cc, even volumes as large as 5 liters using the accessory collection chamber. To facilitate rapid introduction of large amounts of sample, a vibrating feeder is available.

For literature, write: Brinkmann Instruments, Inc., Subsidiary of Sybron Corporation, Cantiague Road, Westbury, N.Y. 11590, or call 516/334-7500. In Canada: Brinkmann Instruments (Canada), Ltd.

Brinkmann Centrifugal Grinding Mill

SYBRON | Brinkmann

THE PULVERIZER.

Circle No. 106 on Readers' Service Card

WORKING SMARTER VS. WORKING HARDER.

Japan's productivity keeps improving.

Germany's too.

"So America's going to have to work harder," people say.

But that's not enough anymore.

We also have to work *smarter.*

America's productivity problem isn't caused by lazy workers. It's partly caused by lazy factories, lazy tools, and lazy methods which dilute the efforts of hard-working people.

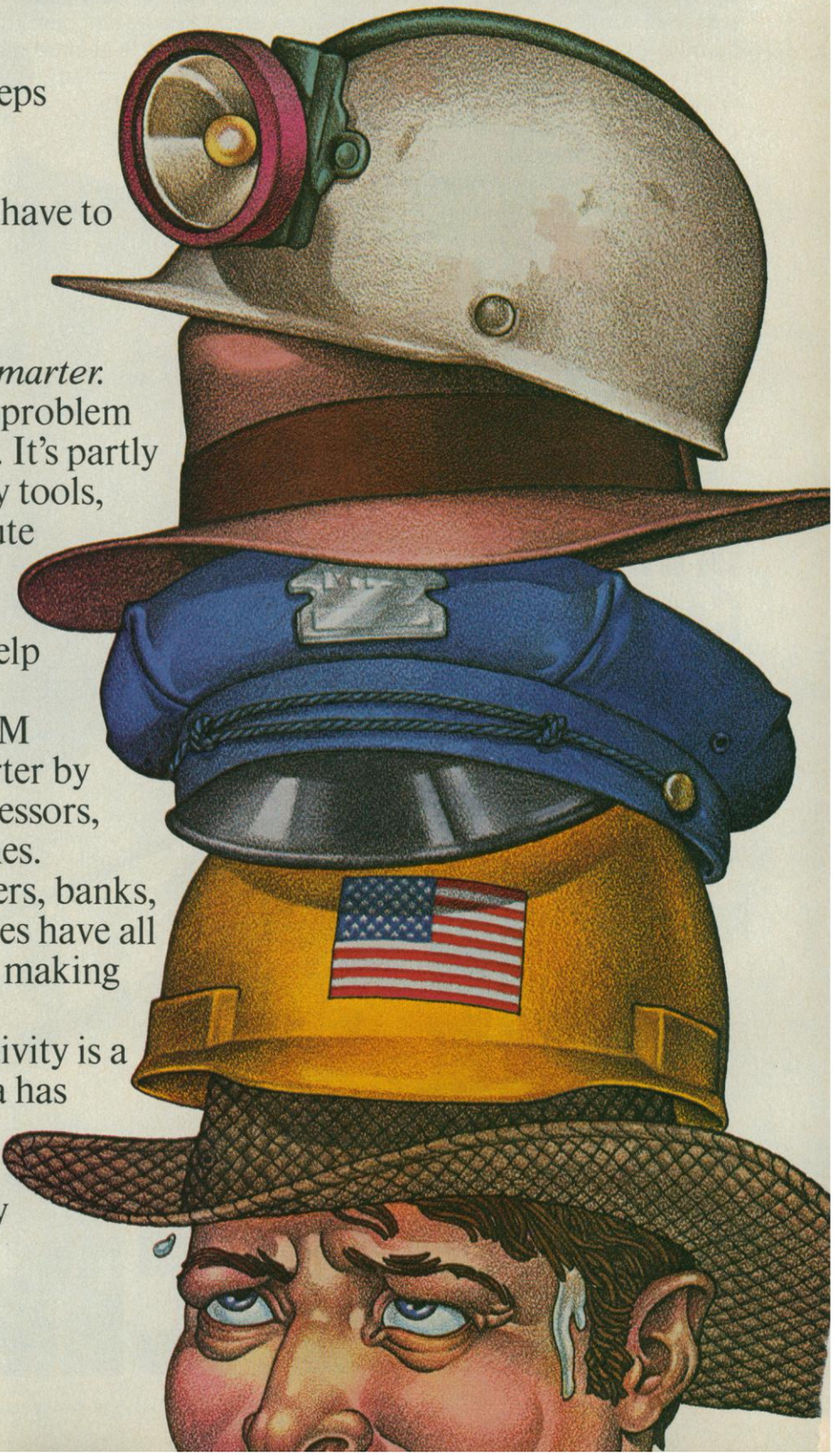
Working smarter can help change that.

Today, thousands of IBM customers are working smarter by using computers, word processors, and electronic office machines. Insurance companies, retailers, banks, farmers, aerospace companies have all become more productive by making *information* work harder.

In world trade, productivity is a key to success. And America has long been the most productive country on earth.

We can stay that way by working smarter.

IBM®



10 October 1980, Volume 210, Number 4466 **SCIENCE**

PSAC: Reestablish It Now

The President's Science Advisory Committee (PSAC) was organized to ensure competent, independent, and responsible scientific and technical awareness at the presidential level of policy-making. It was approved by President Truman in 1951 after the outbreak of the Korean war, reinforced by President Eisenhower in 1957 after Sputnik, and liquidated by President Nixon. The PSAC served an essential function and should promptly be reestablished to supplement the role of the science adviser. The dilution of our post–World War II military, political, economic, and cultural primacy increases the need for such action; rising international tensions, growing domestic problems, and the approaching election make it timely. This is the message conveyed by seven science advisers (DuBridge, Rabi, Killian, Wiesner, Hornig, David, and Stever) and some 15 other scientists, engineers, and administrators who have served under all Presidents since Truman.*

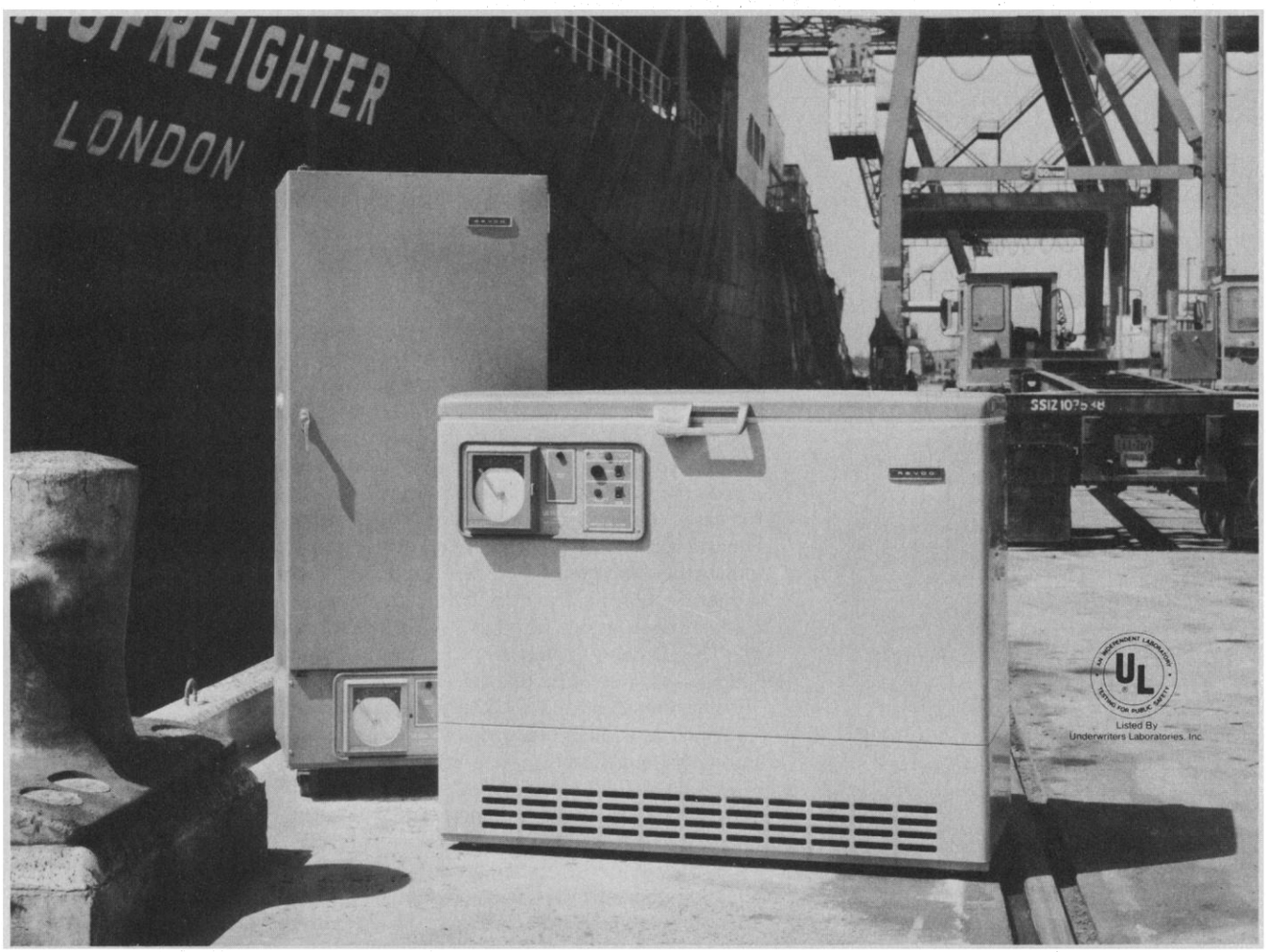
The Truman-Eisenhower apparatus comprised a science adviser to the President, with staff, and the PSAC, which was appointed by and reported to the President and worked with but was independent of the adviser. In 1976, legislation encouraged by President Ford restored the office of science adviser (and gave Congress access to him) but did not recreate the PSAC. Resourceful enlistment of ad hoc panels by Frank Press, the present adviser, has palliated but cannot cure the statutory deficiency.

Science and technology ingredients are essential to policy-making on domestic and foreign issues involved in improving our living standards, promoting domestic tranquility, defending our borders, and seeking arms limitation agreements. Such issues, as Comptroller General Elmer B. Staats pointed out, transcend individual federal agencies and programs and require "improved measures and criteria to support federal decision-making." The President should not rely for guidance solely on his science adviser, who is limited by statute in staff and scope, and cannot rely unquestioningly on his cabinet members or the National Science Foundation director, who must advocate the special and sometimes competing interests of their departments. Nor should high-level scientific expertise be expected to flourish in the White House staff, the National Security Council, or the Office of Management and Budget, where this year's hostages, next year's budget, and the approaching elections constitute long-term issues.

The PSAC, well chosen and actively used, would meet the need. To ensure the requisite stature and visibility, the members of PSAC must be presidential appointees. They should be generalists characterized by prominence, wisdom, courage, discretion, independence, and patriotic dedication; experienced in government; and sensitive to the practicalities of politics. The physical, biological, medical, and social sciences should be broadly represented. There is no room for narrow specialists, however distinguished. Not every member should be a practicing scientist. The PSAC must have the judgment and loyalty to gain the confidence of its President. But this does not mean subservience. Expression of divergent views within the group should be encouraged, but the remedy for irreconcilable differences should be resignation, restoring freedom for public expression. The committee should be small; 9 to 12 members would permit diversity, focus responsibility, and encourage collegiality. The Federal Advisory Committee Act of 1972 and the Freedom of Information Act present serious but not insurmountable impediments. Should a crisis arise or the climate change, Congress may modify them, under the provision of Public Law 94-282 for "periodic revision and adaptation."

Reestablishment of the PSAC would benefit the nation, strengthen the presidency, gratify Congress, and encourage the scientific and technological communities.—WILLIAM T. GOLDEN

**Science Advice to the President*, William T. Golden, Ed., Pergamon, Elmsford, N.Y., 1980. ix + 256 pp. Cloth, $50; paper, $9.95.



WE GET AROUND.

Revco® has made quite a name for itself in a lot of foreign languages.

In fact, you'll find our products in some of the most remote corners of the earth. (At last count people were relying on Revco in 143 countries.) All because of our very sophisticated sales and service network.

Naturally any product demands routine service. We just want to make sure that when your Revco freezer needs servicing, it gets it from somebody who routinely services Revco products.

This is why the same Revco product performance developed in the United States works equally as well in Spain, Japan or South America.

So if you're in the market for a product and service that's good enough to travel abroad, imagine how good Revco products and services are right here at home.

WHY WE'RE NUMBER ONE.

You'll be surprised to learn that our product line is our only product line. It's not a side line. And it's the only product of its kind listed by Underwriters Laboratories, Inc.

Next, take where we build our products. Every space-saving Revco product is made in one of the world's few plants designed exclusively for the manufacture of ULTra-Low® temperature equipment.

Take the way we build the Revco line. Each product is engineered for maximum efficiency and lower operating costs.

Take all this into consideration and we're sure you'll insist on Revco.

REVCO® The world's leader in ULTra-Low® temperature equipment.

Refrigeration Products Division/Rheem Manufacturing Company
1100 Memorial Drive, West Columbia, S.C. 29169 Telephone (803) 796-1700 TWX: 810-666-2103 Cable: Revco

Circle No. 152 on Readers' Service Card