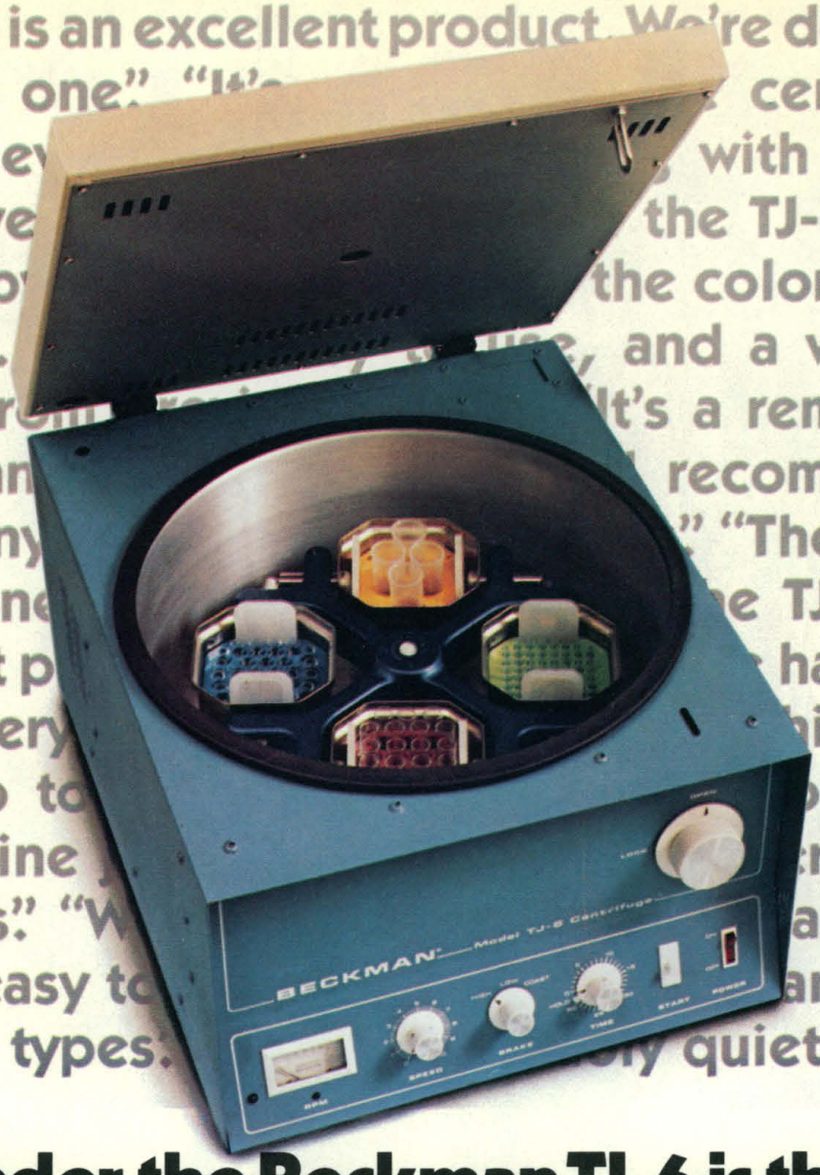
9 November 1979 • Vol. 206 • No. 4419

$1.50

SCIENCE

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

"The TJ-6 is an excellent product. We're delighted we have one." "It's ... centrifuge. Nothing ev... with it." "You folks have ... the TJ-6. We're very happ... the colorful tube adapters. ..., and a welcome change fr... It's a remarkably quiet-runn... recommend a TJ-6 to any..." "The lift-out bowl alone... TJ-6 is an excellent p... have one." "It's a very... ing ever seems to to... lks have done a fine ... ry happy with ours." "W... adapters. They're easy to... ange from previous types... quiet-running



No Wonder the Beckman TJ-6 is the Most Popular Centrifuge Ever Introduced!

You hear the same enthusiastic comments, whether it's the refrigerated or non-refrigerated version. People love to own it, and love to run it.

Users appreciate how quiet it is. They like the removable bowl that makes cleaning a snap. They like the colorful adapters which bring a new practicality and ease of handling to table-top centrifuges.

Owners are delighted with the TJ-6's excellent reliability. And if there is a problem, they know there are hundreds of Beckman service representatives nationwide—at least one in every major city in the U.S. and Canada.

Send for Brochure SB-490 for a full description of this superior table-top centrifuge. Write to:

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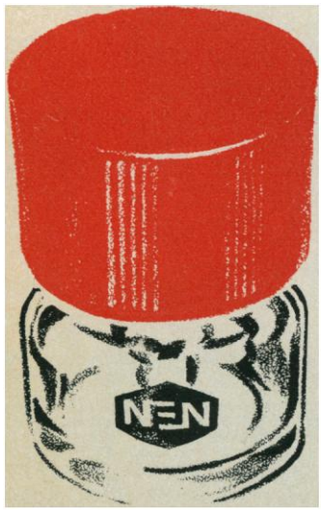
74 Research Assistants for

Receptor Site Studies



α-Adrenergic
Clonidine hydrochloride, [4-^{3}H]-
Desmethylimipramine hydrochloride, [2,4,6,8-^{3}H]-
Dihydro-α-ergocryptine, 9,10-[9,10-^{3}H(N)]-
WB-4101 (2,6-Dimethoxyphenoxyethyl) aminomethyl-1, 4-benzodioxane, 2-[*phenoxy*-3-^{3}H(N)]-
Epinephrine, *levo*-[*methyl*-^{3}H]-
Norepinephrine, *levo*-[7,8-^{3}H(N)]-

β-Adrenergic
Carazolol, DL-[3,6-^{3}H(N)]-
Dihydroalprenolol hydrochloride, *levo*-[*propyl*-2,3-^{3}H]-
Epinephrine, *levo*-[*N-methyl*-^{3}H]-
Hydroxybenzylisoproterenol, *p*-[7-^{3}H]-
Iodohydroxybenzylpindolol, [^{125}I]-
Isoproterenol, DL-[7-^{3}H(N)]-
Norepinephrine, *levo*-[7,8-^{3}H(N)]-
Propranolol, L-[4-^{3}H]-

Aspartate
Aspartic acid, D-[2,3-^{3}H]-
Aspartic acid, L-[2,3-^{3}H]-
Methyl-D-aspartic acid, *N*-[*methyl*-^{3}H]-

Benzodiazepine
Diazepam, [*methyl*-^{3}H]-
Flunitrazepam, [*methyl*-^{3}H]-

Cholinergic
Muscarinic
Acetylcholine chloride, [*N-methyl*-^{3}H]-
Choline chloride, [*methyl*-^{3}H]-
Pilocarpine, [^{3}H(G)]-
Quinuclidinyl benzilate, DL-[*benzilic*-4,4′-^{3}H(N)]-
Scopolamine methyl chloride, [*N-methyl*-^{3}H]-

Nicotinic
Acetylcholine chloride, [*N-methyl*-^{3}H]-
α-Bungarotoxin, [^{125}I]-
Choline chloride, [*methyl*-^{3}H]-
Tubocurarine chloride, *dextro*-[13′-^{3}H(N)]-

Dopaminergic
ADTN Amino-6,7-dihydroxy-1,2,3,4-tetrahydronaphthalene, 2-[5,8-^{3}H]-
Amphetamine sulfate, D-[^{3}H(G)]-
Apomorphine, [8,9-^{3}H]-
Chlorpromazine, [^{3}H]-
Dihydroxyphenylethylamine, 3,4-[*ethyl*-1-^{3}H(N)]- or [*ethyl*-2-^{3}H(N)]-
Haloperidol, [^{3}H(G)]-
Propylnorapomorphine, *N*-[*propyl*-^{3}H(N)]-
Spiroperidol, [1-*phenyl*-4-^{3}H]-

GABA
Alanine, β-[3-^{3}H(N)]-
Aminobutyric acid, γ-[2,3-^{3}H(N)]-
Dihydropicrotoxinin, α-[8,10-^{3}H]-
Isoguvacine hydrochloride, [^{3}H]-
Muscimol, [*methylene*-^{3}H(N)]- or [4-^{3}H]-
Nipecotic acid, [*ring*-^{3}H]-

Glutamate
Glutamic acid, L-[3,4-^{3}H]-

Glycine
Glycine, [2-^{3}H]-

Histamine
H_1
Histamine, [^{3}H(G)]-
Pyrilamine, [*pyridinyl*-5-^{3}H]- (Mepyramine)

H_2
Histamine, [^{3}H(G)]-

Opiate
Dihydromorphine, [7,8-^{3}H(N)]-
Enkephalin (5-L-leucine), [*tyrosyl*-3,5-^{3}H(N)]-
Enkephalin (5-L-methionine), [*tyrosyl*-3,5-^{3}H(N)]-
Enkephalinamide (2-D-alanine-5-L-methionine), [*tyrosyl-ring*-2,6-^{3}H]-
Ethylketocyclazocine, [9-^{3}H]-
Morphine, [6-^{3}H(N)]-

Serotonin
Hydroxytryptamine binoxalate, 5-[1,2-^{3}H(N)]-
Hydroxytryptamine creatinine sulfate, 5-[1,2-^{3}H(N)]-

Steroid
Androgen
Dihydrotestosterone, [1,2,4,5,6,7,16,17-^{3}H(N)]-
Methyltrienolone, [17α-*methyl*-^{3}H]- (R1881)*
Testosterone, [1,2,6,7,16,17-^{3}H(N)]-

Estrogen
Estradiol, [2,4,6,7,16,17-^{3}H(N)]-
Iodo-3, 17β-estradiol, 16α-[^{125}I]-
Moxestrol, [11β-*methoxy*-^{3}H]- (R2858)*

Glucocorticoid
Dexamethasone, [6,7-^{3}H(N)]-
Prednisolone, [6,7-^{3}H(N)]-
Triamcinolone acetonide, [6,7-^{3}H(N)]-

Mineralocorticoid
Aldosterone, D-[1,2,6,7-^{3}H(N)]-

Progesterone
Dihydroprogesterone, [1,2-^{3}H(N)]-
Nor-17α-ethynyltestosterone, 19-[6,7-^{3}H(N)]-
Progesterone, [1,2,6,7-^{3}H(N)]-
Promegestone, [17α-*methyl*-^{3}H]- (R5020)*

*Manufactured by NEN under licensed agreement of ROUSSEL-UCLAF.

Miscellaneous
Dihydroxyvitamin D_3, 1α, 25-[26,27-^{3}H]-
Hydroxyvitamin D_3, 25-[26,27-^{3}H]-
Imipramine hydrochloride, [2,4,6,8-^{3}H]-
Melanocyte stimulating hormone inhibiting factor, [*proline*-2,3,4,5-^{3}H]- (MIF)
Phencyclidine, [*piperidyl*-3,4-^{3}H(N)]-
Reserpine, [*benzoyl*-^{3}H(G)]-

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SCIENCE

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COVER

Reconstruction of the largest species in the fossil family Plotopteridae, shown to scale with the outline of the largest living penguin. These giant seabirds inhabited the North Pacific about 30 million years ago. They were flightless and had paddle-like wings similar to penguins, but belong to the unrelated order Pelecaniformes. See page 688. [B. Dalzell, Rockville, Maryland]

Laboratory animal bedding: is it an uncontrolled variable that can jeopardize your work?

As research becomes more sophisticated, and the analytical systems that track it get more sensitive, one begins to focus on those elements previously viewed as having little real significance. Be it the air our animals breathe, or the noise that disturbs them, or the photoperiod . . . we *now* know that these environmental factors can indeed be consequential. But how about animal bedding? Consider, for example, this authoritative comment:

"To ensure that [bedding does not] serve as a means of introducing diseases, parasites, potential disease vectors (such as insects), or chemical contaminants into animal colonies, breeders and users of laboratory animals should exercise caution in the purchase, transportation, and the handling of these products."

"Guide for the Care and Use of Laboratory Animals." ILAR (NIH, DHEW Pub. no. 78-23).

Accordingly, if you're involved in the kind of work that can be jeopardized by a bedding of uncertain genealogy, we invite you to familiarize yourself with two quality laboratory animal beddings. To begin with, here is a revealing assay of our Ab-Sorb-Dri™ and our Pine-Dri™ beddings.

	Ab-Sorb-Dri™ (Hardwood)	Pine-Dri™ (Pine)
Microbiological Tests		
Standard plate count	180	0
(Comment: *significantly* lower than other beddings tested.)		
Coliform		
Presumptive	neg.	neg.
Confirmed	neg.	neg.
Pseudomonads	neg.	neg.
Yeasts & molds	0	0
Irritant Properties		
24 hr intact skin	0.0	0.0
abraded skin	0.0	0.0
72 hr intact skin	0.0	0.0
abraded skin	0.0	0.0
Conclusion:	non-primary irritant	non-primary irritant
Pesticide Residues		
Chlorinated hydrocarbons		
BHC	<0.01	<0.01
Lindane	<0.01	<0.01
Iteptachlor	<0.01	<0.01
Aldrin	<0.01	<0.01
Heptachlor Epoxide	<0.01	<0.01
DDE	<0.01	<0.01
Dieldrin	<0.01	<0.01
Endrin	<0.01	<0.01
DDD	<0.01	<0.01
DDT	<0.01	<0.01
Organophosphates		
Diazinon	<0.01	<0.01
Methyl Parathion	<0.01	<0.01
Malathion	<0.01	<0.01
Ethyl Parathion	<0.01	<0.01
Ethion	<0.01	<0.01
Polychlorinated Biphenyls (PCB)	0.03	0.02
Detergent Residues	0.0	0.0
Heavy Metals	<10.0 PPM	<10.0 PPM

So if a consistent, "defined" bedding sounds like worthwhile insurance, let us tell you more.

For more information

To learn more about Ab-Sorb-Dri and Pine-Dri and the name of your local distributor, drop us a line. Lab Products, Inc., 365 W. Passaic St., Rochelle Park, N.J. 07662 (or phone: 201/843-4600).

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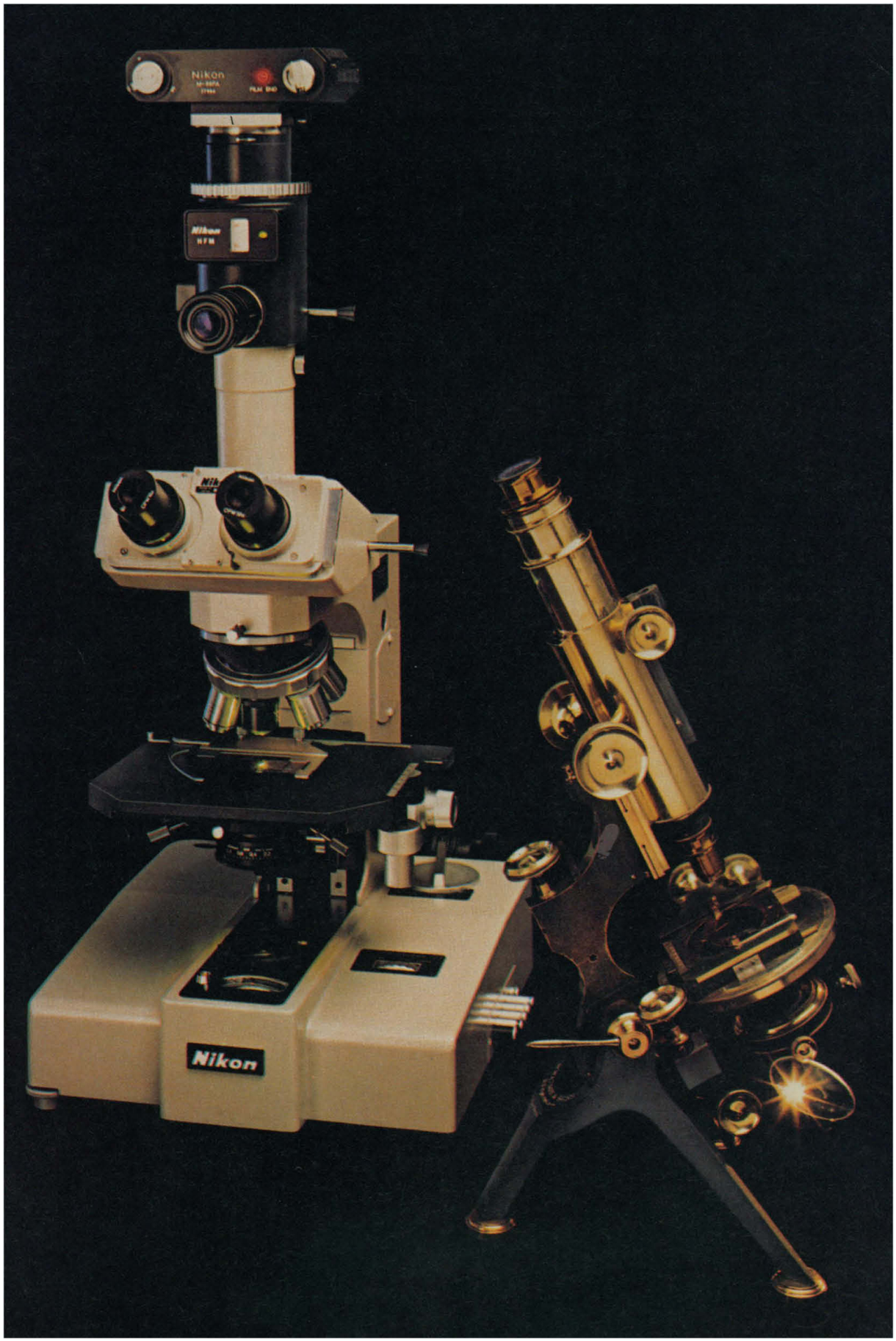
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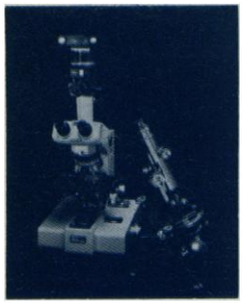

From the beginnings of biomedical research, instruments have played an important role in the drama of discovery. Crude though they were, early microscopes served to extend the vision of the determined researchers who, in turn, extended our understanding of life itself.

Today, researchers are still characterized by the rare insight and unusual skill of their predecessors. But their vision of the microscopic world is considerably sharper; thanks in part to Nikon's tireless dedication to the creation of superior optics.

Now, with a single stunning innovation, Nikon has produced an unprecedented advance in microscope technology. Called CF optics, it's a development so revolutionary that it represents far more than a refinement. It stands as nothing less than an entirely new standard of light microscope performance. A standard against which all others will be measured.

To achieve this dramatic breakthrough, Nikon engineers combined a new, extra-low dispersion glass with an ingenious concept in optical design to virtually eliminate chromatic aberration. The Nikon CF system delivers unparalleled resolution, color fidelity, flatness of field and image brightness. In fact, CF optics bring to Nikon resolving power closely approaching theoretical limits.

Biomedical research is a matter of life itself. It demands Nikon. The difference between seeing and not seeing. Knowing and not knowing.

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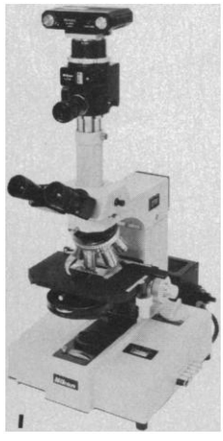
II **OPTIPHOT RESEARCH MICROSCOPE WITH HFM** — Versatile, rugged microscope features CF optics for superb field flatness, contrast and resolution. Shown here with trinocular bodytube and the advanced, computer controlled HFM camera system for consistently correct exposures — automatically.

III **SMZ-10 ZOOM STEREO MICROSCOPE** — High-resolution zoom stereo microscope with the ability to photograph actual stereo pairs by the simple touch of a lever. Features a continuous zoom over a wide magnification range without the need to change focus or working distance.

IV **LABOPHOT LABORATORY MICROSCOPE** — Developed with special attention to the sturdiness and simplicity of operation required in laboratory and clinical work. Employs CF optics for unsurpassed optical performance. The microscope accepts the full line of Nikon accessories, including photomicrography.

V **FLUOPHOT RESEARCH FLUORESCENCE MICROSCOPE** — Provides transmitted-light or reflected-light fluorescence with convenient one-step selector knob. Built-in turret with four reflected-light fluorescence excitation modes. Brighter-than-ever images with 200-watt DC mercury illumination and high-transmission trinocular head.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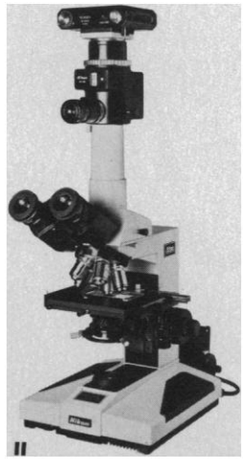
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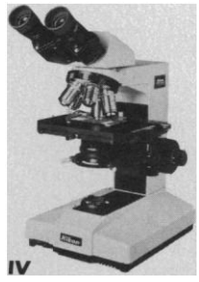
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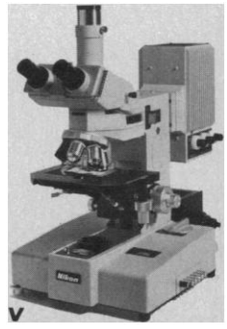
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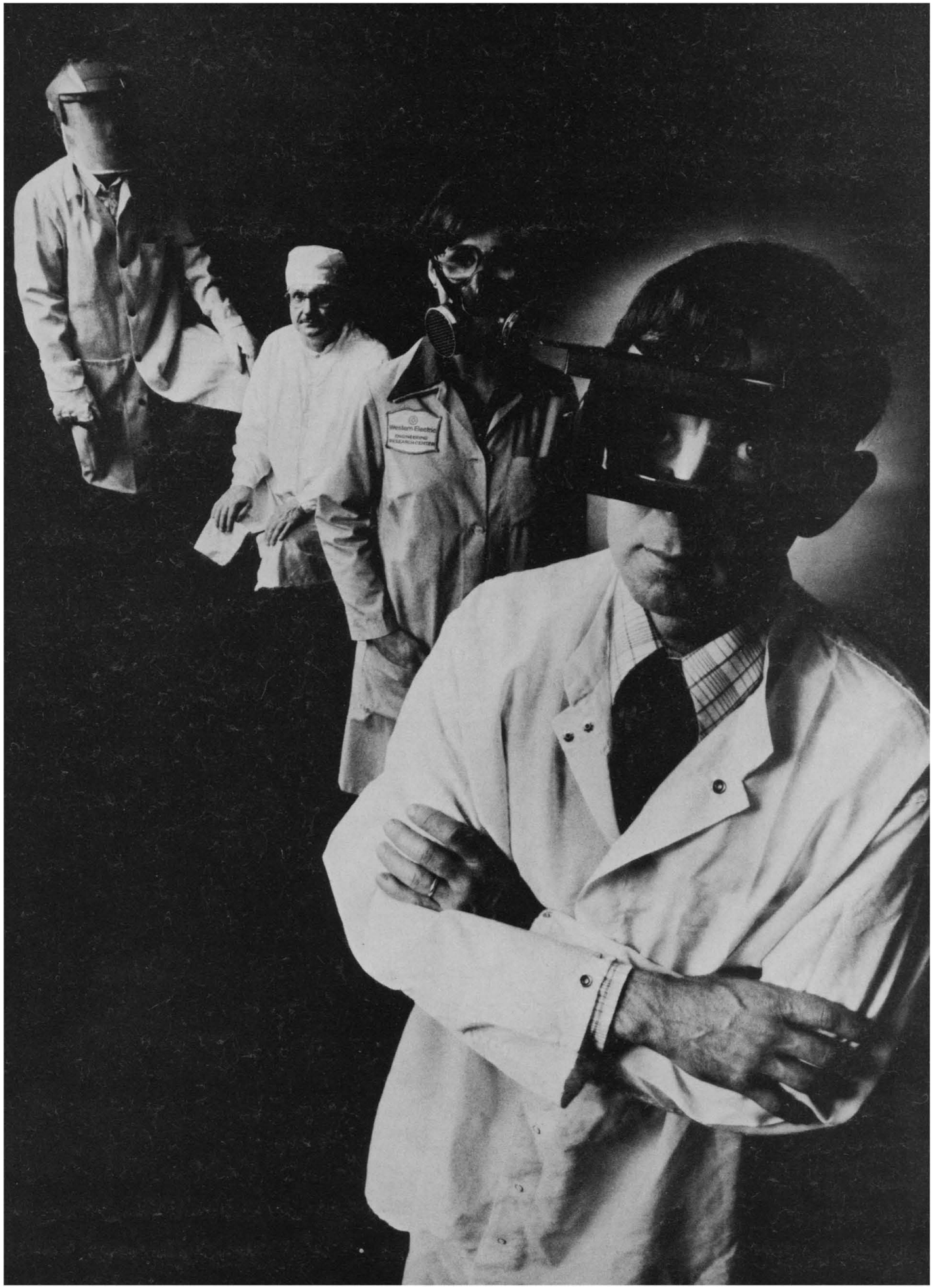
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We pay these scientists to make our production lines obsolete.

As soon as there's a better way to do something, the old way becomes obsolete.

And these scientists do nothing *but* design new and better ways for Western Electric to manufacture products for the Bell System. In the last two years, they and their colleagues at Western Electric's Engineering Research Center have helped cut costs by over $156 million.

They are a vital part of Western Electric's commitment to helping the Bell System keep the cost of communications service down, while keeping the quality up.

The Factory's Laboratory

The people at our Engineering Research Center work full time on manufacturing research. Over 50% of them are PhD's.

At home in the factory as well as the lab, they turn theoretical experiments into real savings. For example, while exploring ways to improve production of telephone circuit boards, they invented a totally new material with which to make the boards and a whole new way to mass-produce them.

Another breakthrough is already saving more than $2 million a year. It's a new soldering technique that makes 20,000 connections in less than 60 seconds.

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These are just a few examples of what the Engineering Research Center does throughout *all* of Western Electric's manufacturing operations — developing new ideas in technology to improve telephone products and produce them at lower cost.

Anticipating the Future

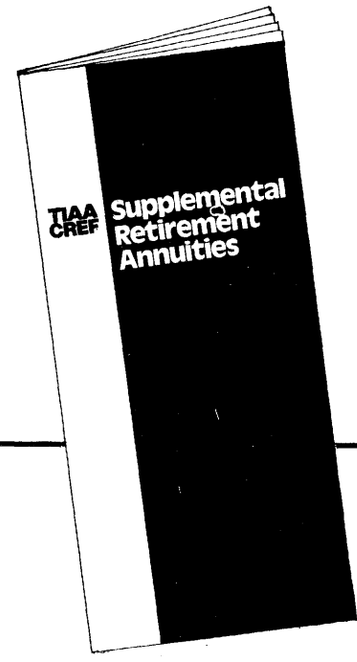
Much of the work of the Engineering Research Center is designed to keep Western Electric ahead of technology, by anticipating what new processes will be needed for tomorrow's products.

It's a total and ongoing commitment. A commitment to provide you with the highest quality telephone service at the lowest possible cost.

Keeping your communications system the best in the world.

Western Electric

TIAA-CREF Supplemental Retirement Annuities



for tax-deferred annuity programs

Supplemental Retirement Annuities (SRA's) are new forms of TIAA and CREF contracts designed expressly for use by persons who want to set aside tax-deferred retirement funds over and above amounts being accumulated under their institution's basic retirement plan. They are available for employees of colleges, universities, private schools and certain other nonprofit educational organizations with tax-deferred annuity (salary-or-annuity option) programs. Through a properly drawn agreement with their institution, staff members may divert part of their compensation before taxes to the purchase of these new contracts.

And SRA's are cashable at any time. This means that if the money accumulated by salary reduction is needed before retirement, the SRA contracts can be surrendered for their cash value. Benefits, whether payable in cash or as income, are taxable as ordinary income when received.

For more information and answers to questions send for your copy of the booklet on Supplemental Retirement Annuities.

Send me a booklet describing
TIAA-CREF Supplemental Retirement Annuities.

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It is more capable, with its microcomputer, than any other spectrophotometer.

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It is easier to use, with its simple keyboard language and easy interchange of accessory systems.

It is more precise, more reliable, more convenient, more advanced and more everything than any other UV-Vis spectrophotometer.

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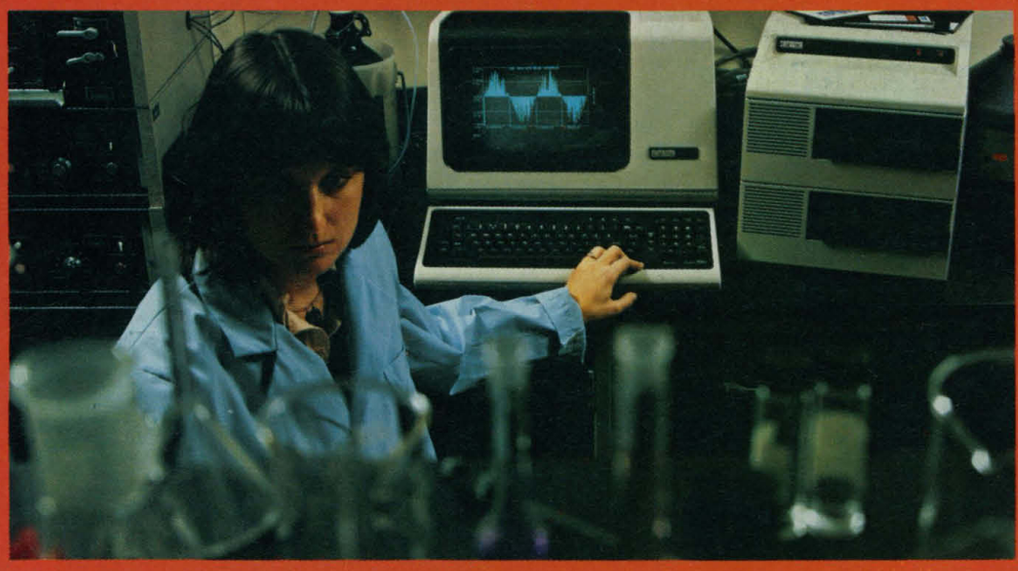

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Easy-to-use features:
- Proven PDP-11 microcomputer
- Ready-to-run BASIC software
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NEW

MINC, the lab system that wheels from job to job—$12,900.*
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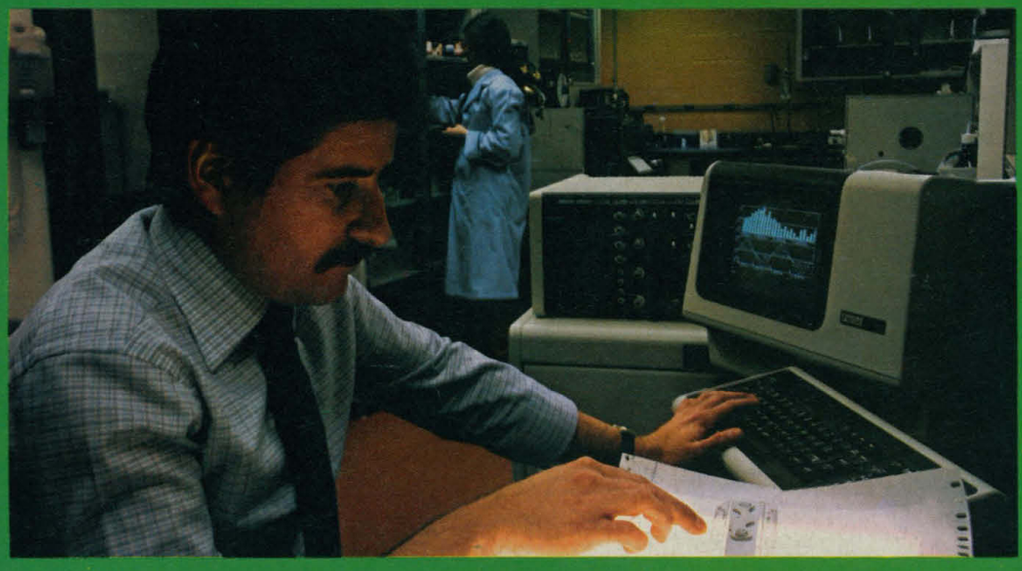

DECLAB-11/MNC, the mass storage FORTRAN system—$21,000.*
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- Powerful FORTRAN software and RT-11 operating system
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- Hardcopy or graphics terminal
- Optional IEEE Bus interface
- Three serial line interfaces
- Seven plug-in, optional, input/output modules

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The newest member of the MINC family—MiniMINC—is a complete desk-top computer system with all the power and all the BASIC software for graphic, scientific, and laboratory applications that have made MINC such a success.

With half-million character dual floppy storage, MiniMINC has all the functionality of a true computer system. It has five serial line interfaces for peripherals and lab instruments and communications with a host computer, and like its bigger brothers, MINC and DECLAB-11/MNC, MiniMINC is built around the proven Digital PDP-11 microcomputer.

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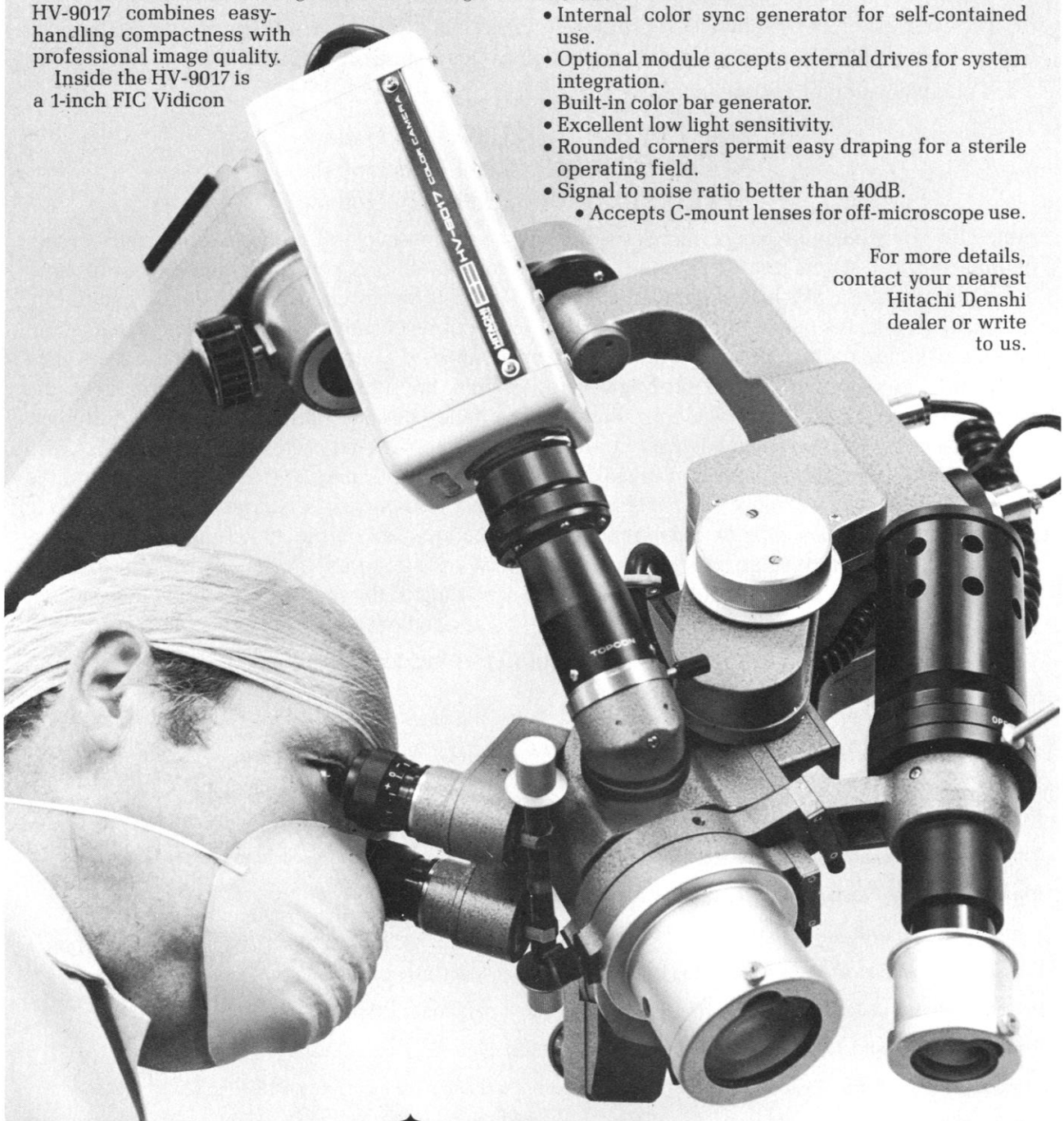

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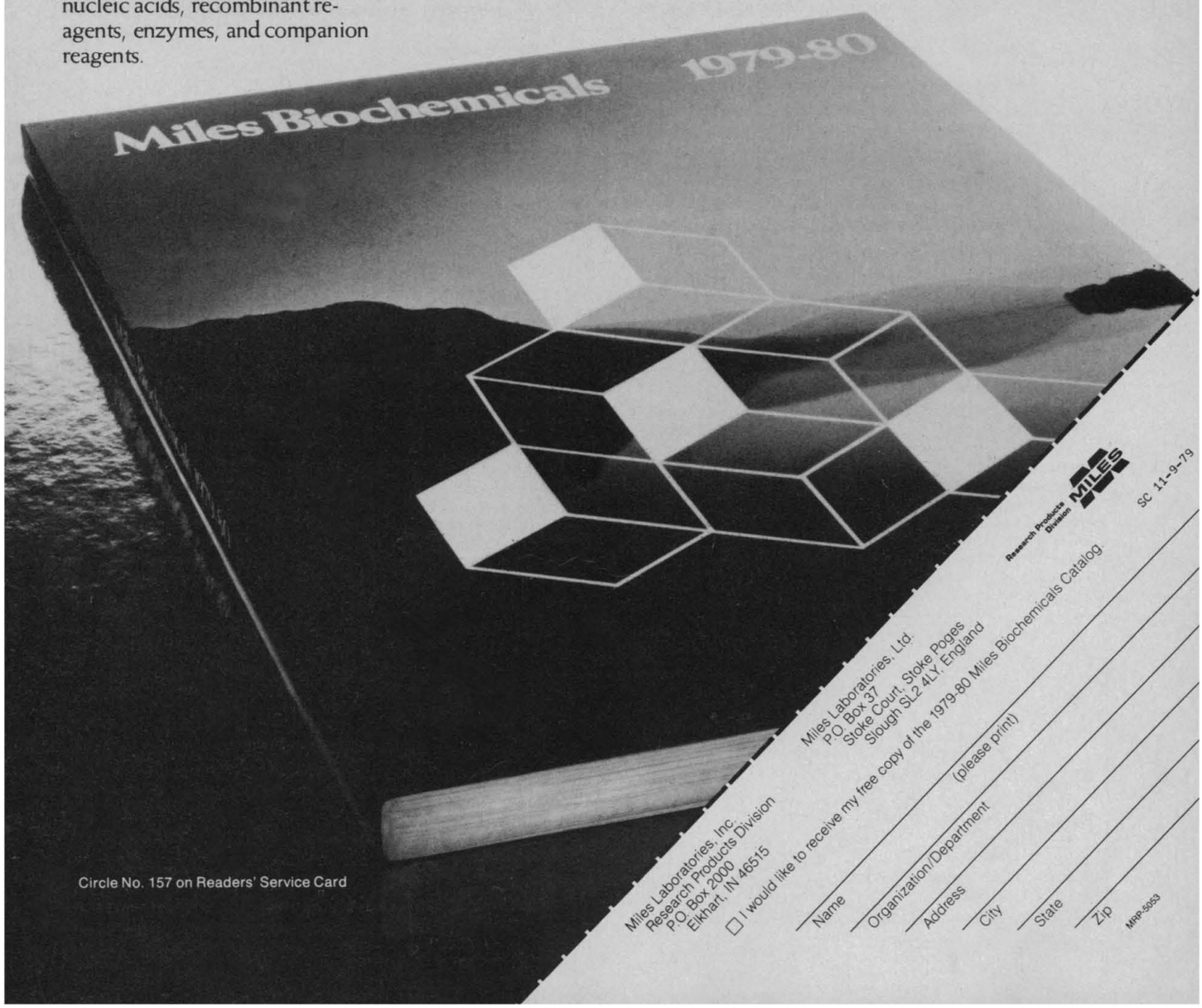

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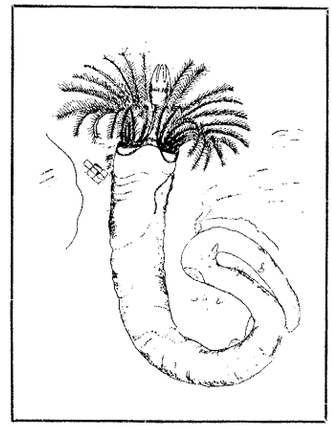

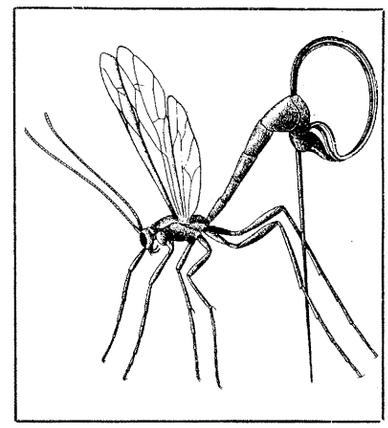

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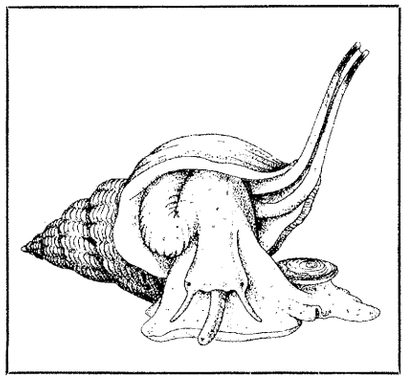

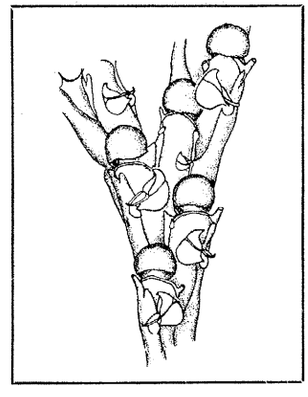

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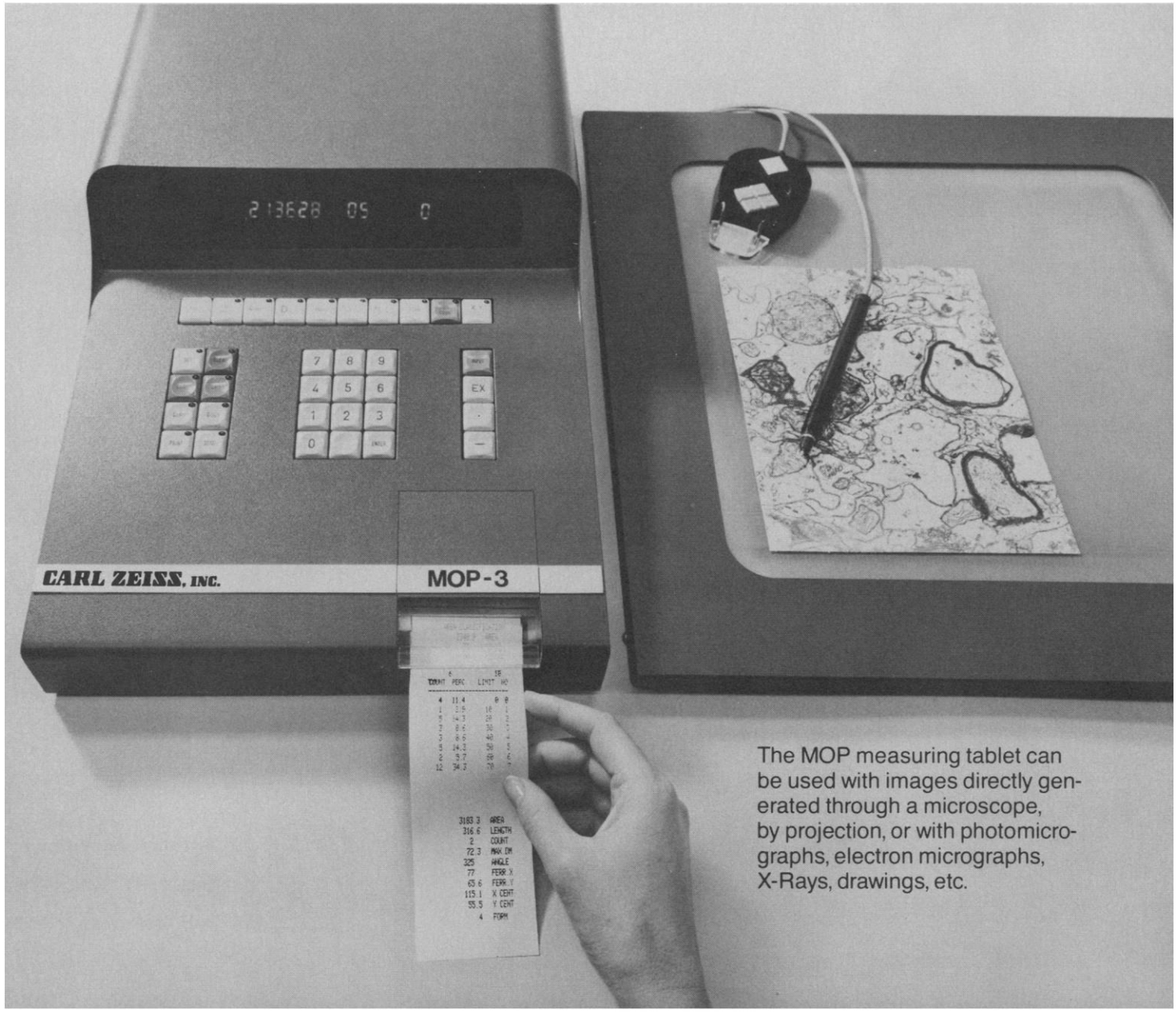

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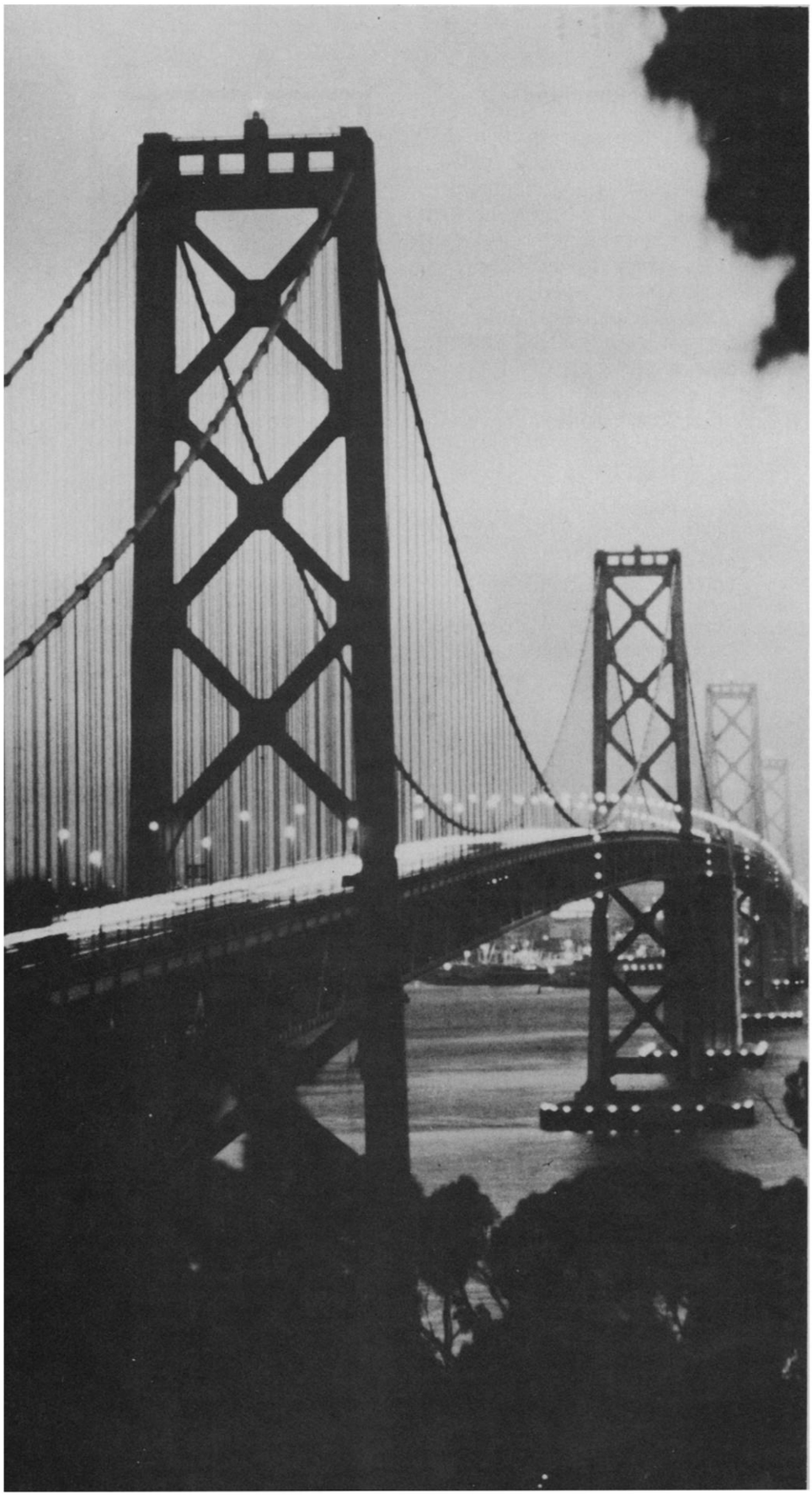

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LETTERS

Max Born: Another Impression

The review by J. L. Heilbron of the published "Recollections" (*1*) of my late father Max Born (17 Aug., p. 740) gives an inadequate impression of his character. As it was his character as much as his scientific imagination that provided the basis of the world center for theoretical physics in Göttingen, that impression should not be left uncorrected.

What Heilbron describes as my father's continuous self-depreciation was the marvelous, unconscious humility which is a hallmark of the greatest men. He was quite well aware of his mental powers but clearly felt strongly that they gave him no rights over others. He was anything but humorless; he loved fun and laughed a great deal. To describe him as merely decent is a masterpiece of understatement; he was one of the innately best people anyone could hope to meet.

His sparks of genius were by no means limited to physics. Heilbron leaves out vast areas of achievement which were on the highest level: his music, his philosophy, his political activities, his work for others, and his many close friendships with outstanding contemporaries in science and the arts.

Those who read the book will realize that Max Born was rightly appreciated for many wonderful qualities, quite apart from those he displayed as a scientist.

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Two-Career Job Hunting

Since we recognize that many women in academia are penalized by being part of two-career households (21 Sept., p. 1125), the question becomes, How do we deal with the problem?

The right kind of data retrieval system may help. It is possible for employment services to index available jobs by geographical proximity for retrieval by pairs. For example, a professor of physics may be sharing a household with an associate professor of political science, and both are looking for jobs; a computer program can be set up to seek out suitable jobs within reasonable physical proximity one of another. Defining the

terms "suitable" and "proximity" would be done with the help of the couple involved.

To get enough job openings into such a system (or to interconnect the existing systems) is likely to be a substantial effort, but the expense conceivably could be borne by affirmative action programs in public and private institutions.

This kind of help for couples in academia could be extended to other kinds of two-career households. One could simply list the locations of the jobs not by institution and institutional proximity but by zip code.

CHARLES T. WALBRIDGE
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Nuclear Accident

Peter A. Morris (Letters, 13 July, p. 148) discusses the "eminently safe nuclear operations in the United States" accomplished during the development and application of high-powered nuclear reactors. No mention is made of the SL-1 accident which occurred at the National Reactor Test Station in Idaho on 3 January 1961 (*1*). At the time, the reactor in question was managed by Combustion Engineering, Inc. This accident is notable in that the entire crew of three persons who were on duty died within hours of the event as a result of their injuries. It is important to note that the development of high-powered reactors in this country was not totally free of safety errors, as Morris' letter might suggest.

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Department of Physics, University of Pennsylvania, University Park 16802

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Phenacetin Studies

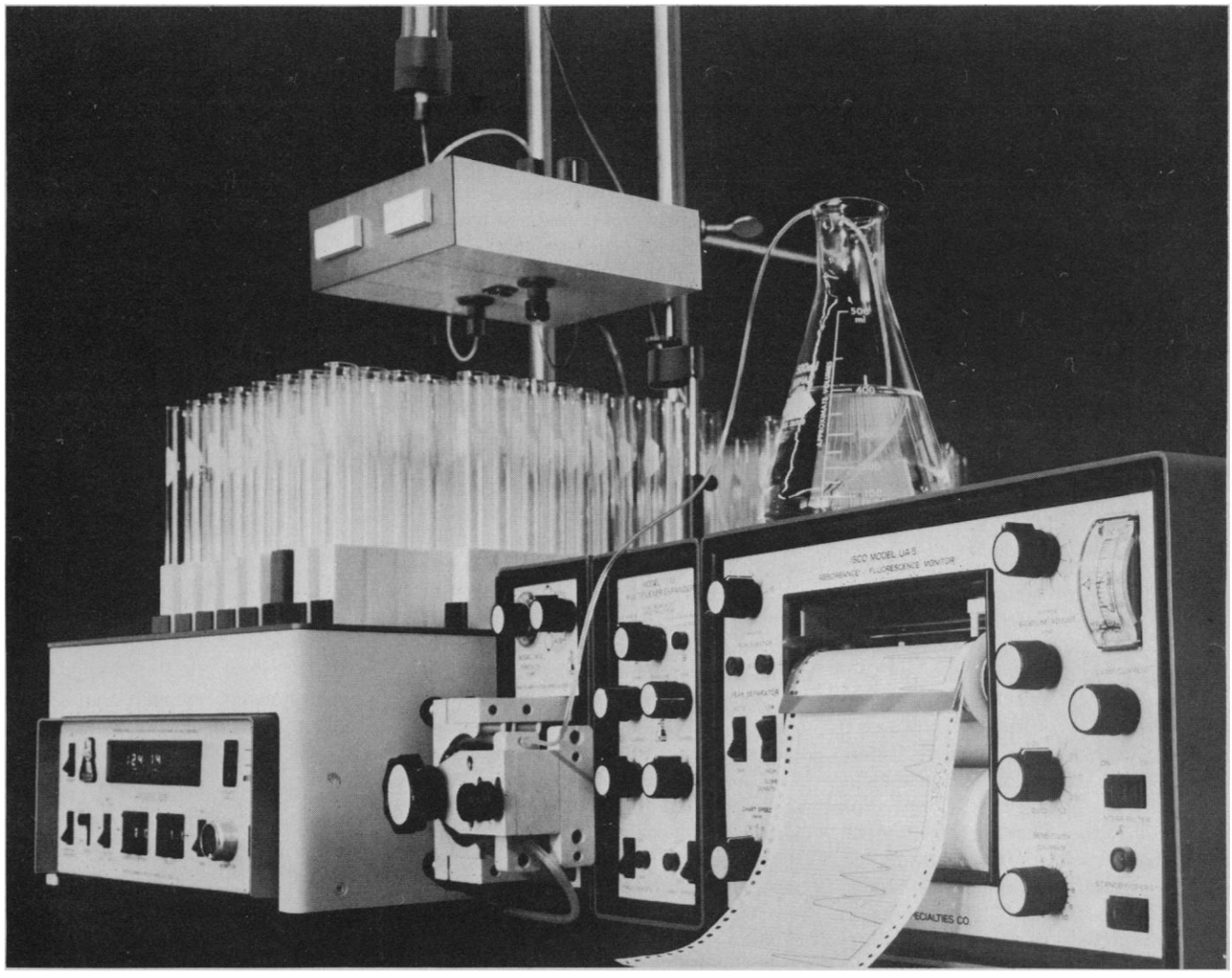
Macklin *et al.* (Letters, 13 July, p. 144) write that phenacetin is not as harmful as the many reports concerning its carcinogenicity would indicate. We are concerned that their letter and the previous one by Cuatrecasas (5 Jan., p. 6) may introduce a number of misconceptions into the literature if left unanswered.

The case reports concerning the carcinogenicity of analgesics containing phenacetin cannot be considered insignificant. Attention was drawn to the carcinogenic properties of phenacetin by the association of the abuse of this drug with the development of a relatively uncommon type of tumor, that of the renal pelvis. More than 140 cases of kidney and bladder tumors have now been reported in the literature (*1*) among abusers of phenacetin-containing analgesics, that is, those taking more than 1 gram per day—the maximum recommended dose of some products that are currently available in this country without a prescription. Phenacetin-containing analgesics are usually of two types: those containing antipyrine (phenazone), phenacetin, and caffeine and those containing aspirin, phenacetin, and caffeine. The mutagenicity of *amino*pyrine is irrelevant, since the patients in the Swedish studies were known to have taken primarily antipyrine-containing analgesics. Phenacetin and caffeine are the ingredients common to all the analgesic mixtures implicated in the above reports of tumor induction in Sweden, Australia, and the United States. There is no reason to believe caffeine is the causative agent.

In studies (*2*) that show evidence of phenacetin carcinogenicity, doses of 500 milligrams per kilogram or higher were administered. Human abusers of the analgesic mixtures often take 20 milligrams per kilogram per day for 20 years or more before kidney failure or tumor formation occurs. Given the fiscal and statistical limitations of experimental carcinogenesis studies, it appears reasonable to administer 500 milligrams per kilogram per day for 2 years to the relatively small numbers of animals usually employed in such tests.

Unlike the studies cited above, the Burroughs Wellcome study of phenacetin effects on C57BL/6 mice has not been published or made available to the scientific community. A single negative experiment with one inbred strain is not definitive, since the animals may have a genetically restricted capacity to carry out the metabolic events crucial to the carcinogenic process. The metabolic events responsible for the carcinogenic activity of a compound are not necessarily those that contribute to its acute toxicity.

The Data Evaluation/Risk Assessment Subgroup of the National Cancer Institute's (NCI's) Clearinghouse on Environmental Carcinogens considered the NCI bioassay (*3*) of an aspirin, phenacetin, and caffeine (APC) mixture to be inconclusive rather than negative. It was unanimously recommended by this committee that APC be considered for retesting in the bioassay program. Urinary tract and endocrine tumors were found that were considered important, al-



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though their incidence was statistically insignificant. The use of Fischer rats in these studies may have resulted in an underestimate of the carcinogenic effects of phenacetin, since Fischer rats are known to be relatively resistant to the induction of extrahepatic tumors by aromatic amines (*4*). In contrast, aromatic amines may induce high incidences of mammary and ear duct tumors in Sprague-Dawley rats (*5*). Such tumors were found by Johansson and Angervall in their 1976 phenacetin study (*2*).

The claims made by Macklin *et al.* concerning the use of pelleted diets are speculative. Much of their argument is based on the premise that the melting point of phenacetin is exceeded in the pelleting process. The melting point (mp) of phenacetin given in their letter is incorrect; phenacetin melts at 134° to 135°C (*6*) (273° to 275°F), not at 134° to 135°F. Even if the melting point were reached, they present no evidence that significant degradation would occur or that *N*-oxidation would occur spontaneously.

The argument that the Charles River Formula diet used by Isaka *et al.* (*2*) contains *N*-nitroso derivatives which might be responsible for tumorigenicity overlooks the fact that control animals fed the same formula developed only a small number of tumors. Whether there may be synergistic effects between nitrosamines in commercial feed and test compounds is a matter of some concern (News and Comment, 13 Oct. 1978, p. 192; Letters, 8 Dec. 1978, p. 1034; Letters, 5 Jan., p. 7) that has not been resolved. While there is no evidence that this phenomenon occurred in this instance, phenacetin can act synergistically with at least one carcinogenic nitrosamine in the induction of urinary bladder tumors (*7*). To minimize this carcinogenic effect of phenacetin would ignore the cumulative effects of the exposure of humans to a multiplicity of carcinogens over their lifetime.

Although the structure of phenacetin allows for a number of metabolic reactions that are not possible with 2-acetylaminofluorene, *N*-hydroxylation of phenacetin does occur, and there is reason to believe that this is a vitally important step in the metabolic activation of phenacetin, as it is for 2-acetylaminofluorene (*8*). *N*-Hydroxyphenacetin is both a carcinogen (*9*) and, when enzymatically activated, a mutagen (*10*). The possibility that phenacetin may be nitrosated has received little attention (*11*).

In contrast to the claim by Macklin *et al.*, both phenacetin and *N*-hydroxyphenacetin *have* been demonstrated to be mutagenic to *Salmonella typhimurium* TA 100, with the supernatant (9000*g*) from hamster liver homogenate as the activating system (*12*).

Although phenacetin is not as potent a carcinogen as some others to which we are exposed daily, we believe that its use in nonprescription analgesics should be banned. The ever-increasing body of data from animal and human studies concerning the metabolism, mutagenicity, and carcinogenicity of phenacetin, is impossible to ignore. Swedish and Australian authorities have long since taken action to minimize exposure to phenacetin. The documented cumulative effects of carcinogens argues strongly for the reduction of exposure to phenacetin. Alternative analgesics are available.

J. B. VAUGHT
C. M. KING

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Erratum: In the report by M. E. Trulson and B. L. Jacobs, "Long-term amphetamine treatment decreases brain serotonin metabolism: Implications for theories of schizophrenia" (21 Sept., p. 1295), the column headings "Norepinephrine" and "Tryptophan" in Table 1 (p. 1296) are transposed. The data under "Norepinephrine" should have been listed under "Tryptophan," and vice versa.

Erratum. A News and Comment briefing, "Carcinogens in Scotch" (24 Aug., p. 769), incorrectly reported that carrot and beet juice contain relatively high levels of nitrosamines. So far as is known, they do not. They do contain nitrates and nitrites, the precursors of nitrosamines.

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9 November 1979, Volume 206, Number 4419 **SCIENCE**

New Magazine: Opportunity for the Membership

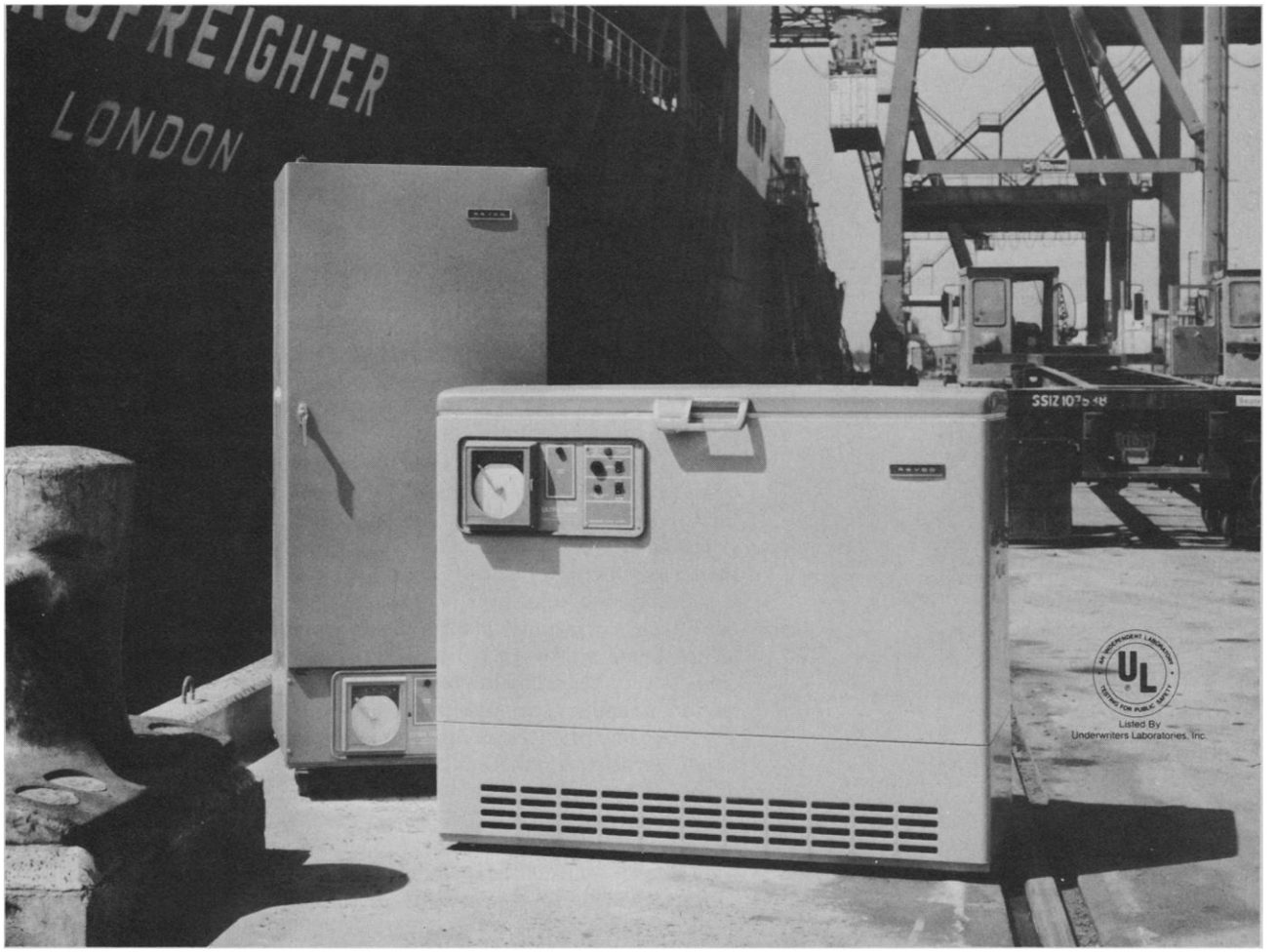
The Board of directors of the AAAS, meeting in Washington on 20 and 21 April, unanimously made the important decision that the Association should publish a new magazine, to be called *Science 80*, *Science 81*, *Science 82*, and so on. It is in no sense a substitute for the present *Science* magazine, which will continue as before to serve the membership and to present AAAS to the world. The object of the new magazine is to bring the findings, the methods, the spirit, and the ethic of science to a larger audience of perhaps a half-million to a million people. It will be colorful, and written to a considerable extent by professional science writers. It will be less technical than *Scientific American*, more rigorous than *Smithsonian*, and more theoretical than *Popular Mechanics*. A careful study of the market has suggested that there is a niche for such a magazine.

If that were all, however, why should AAAS do it? Why not leave it to one of the commercial publishers who have also shown interest in this niche? There are two major answers to this question. One is that AAAS from its very beginning has regarded the education of the general public in matters scientific to be one of its major functions. The second is that the new magazine provides an opportunity for the membership of the Association to participate in this educational enterprise in a variety of ways. Much of the strength of AAAS is that it symbolizes the existence of a scientific community, interested in the pursuit of evidence about a real world and inspired by curiosity and a love of veracity. Scientists are also human beings and share the faults of the species, but we should never forget that they are a subspecies of human beings with a peculiar culture of their own. If the new magazine does not reflect this culture, it will fail in its purpose of presenting science, which is a product of the scientific community, to the public at large.

Since the new magazine must fill felt public needs, the editors will set up mechanisms for identifying urgent public wishes for authentic information. However, at the same time, members should regard this new magazine not merely as a consumer good, but as an opportunity to express their own concerns and interests in the presentation of science to a larger public. I suggest that each of the AAAS sections appoint one or two correspondents to read the magazine carefully and send brief reports to the Association with criticisms and suggestions for further articles, to be transmitted to the editor and the editorial board. Members should write letters to the editor and should submit suggestions for articles themselves.

In the start-up phases of the new magazine, virtually all the content will be prepared by professional science news writers. Too few practicing scientists are good science writers at a popular level. After the style and level of the magazine are fully established, members of the Association should try to practice the art of science writing for the general public. There is no guarantee, of course, that unsolicited articles would be accepted, but this is true also of *Science* or any other reputable journal. Nevertheless, such articles would be welcomed with a clear understanding about the audience to which they are addressed.

Once the magazine is established, one would like to link it with an extensive research project in how the images of science in the minds of the general public change in regard to content and credibility. The scientific community may be facing a deepening crisis of credibility. We have pretended to know more than we do. Science is a treasure chest, but every treasure chest is also a Pandora's box and we cannot escape responsibility as a scientific community for the evil consequences as well as the good arising from increased knowledge. A new magazine should give us an opportunity to work out some of these problems and to break down some of the walls, both of language and of pride, that separate scientists from our fellow human beings.—KENNETH E. BOULDING



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Immunoreagents

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Literature

Barium in Seawater details atomic absorption techniques for detecting this refractory element. Instrumentation Laboratory. Circle 776.

Top-Loading Balances lists a complete line of Super-Range models with high accuracy at high capacities. Brinkmann Instruments. Circle 777.

Bench-Top Chemostat is devoted to BioFlo, a fully instrumented system for pure culturing of microorganisms, cells, or tissues. New Brunswick Scientific. Circle 789.

Differential Scanning Calorimetry lists the components and design features of the TA2000D system. Mettler Instrument. Circle 791.

Fraction Collector explains the functions of the MultiRac, which is controlled by a microprocessor. Collection modes, duration, selection, and other parameters are programmed precisely. LKB Instruments. Circle 792.

Ion-Selective Measurement catalogs the features of SelectIon analyzers including three instruments, more than 20 specific ion electrodes, and supplies and reagents. Beckman Instruments. Circle 793.

Newly offered instrumentation, apparatus, and laboratory materials of interest to researchers in all disciplines in academic, industrial, and government organizations are featured in this space. Emphasis is given to purpose, chief characteristics, and availability of products and materials. Endorsement by *Science* or AAAS is not implied. Additional information may be obtained from the manufacturers or suppliers named by circling the appropriate number on the Reader Service Card (on pages 630A and 726A) and placing it in the mailbox. Postage is free.

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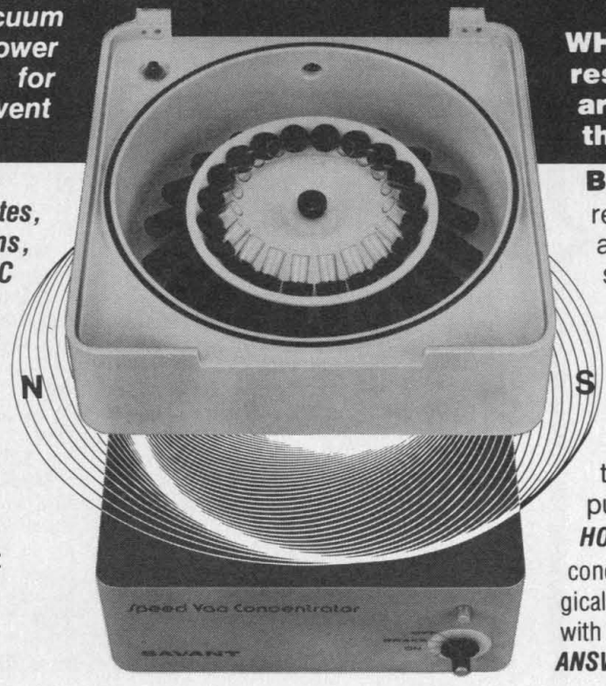

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