SCIENCE

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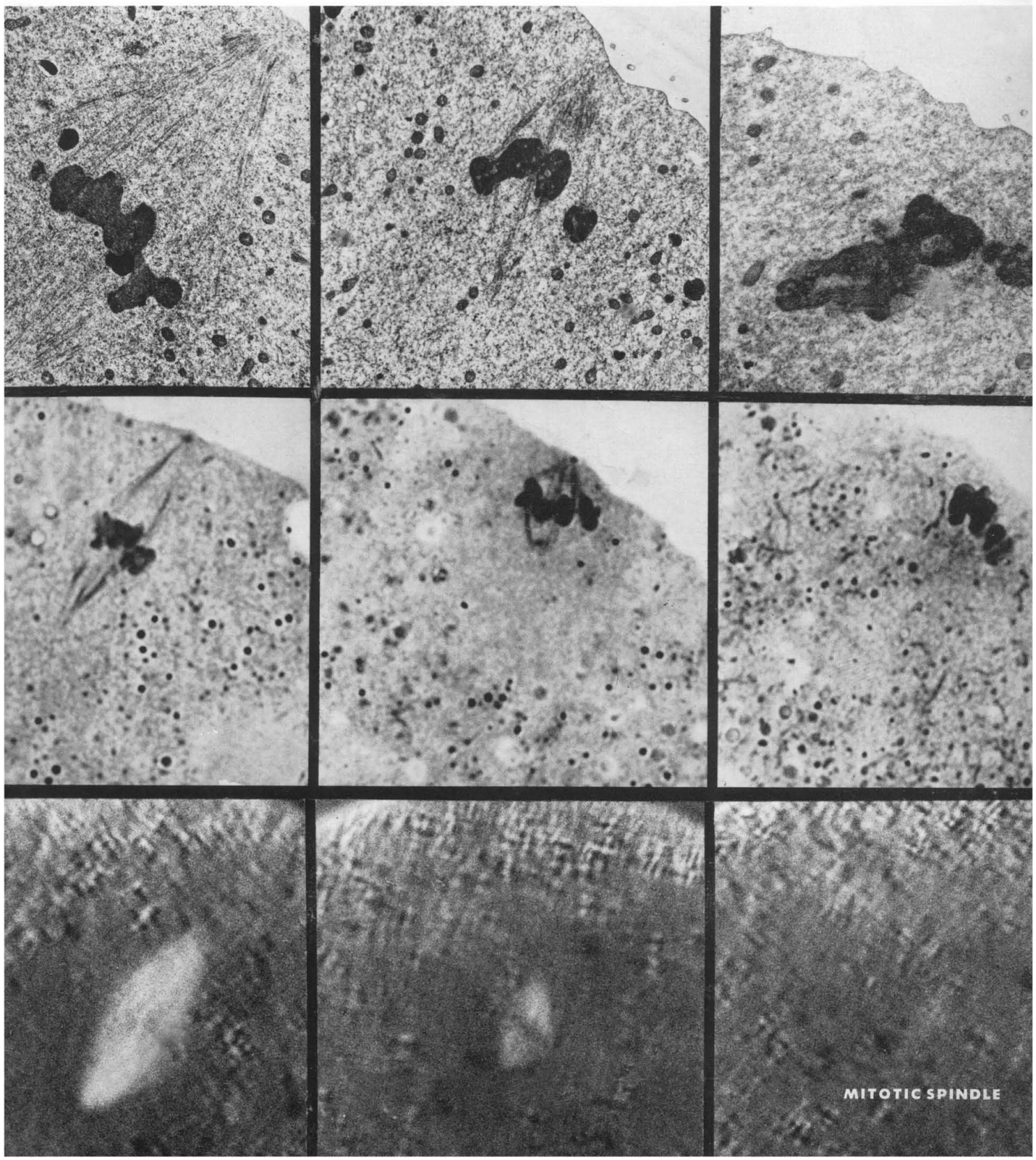
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



The all-new, hp 1200 Oscilloscope System is designed and manufactured for easy-to-set-up, foolproof operation. You make almost any measurement in your discipline because the high sensitivity and bandwidth are more than adequate for physiological, mechanical and chemical purposes.

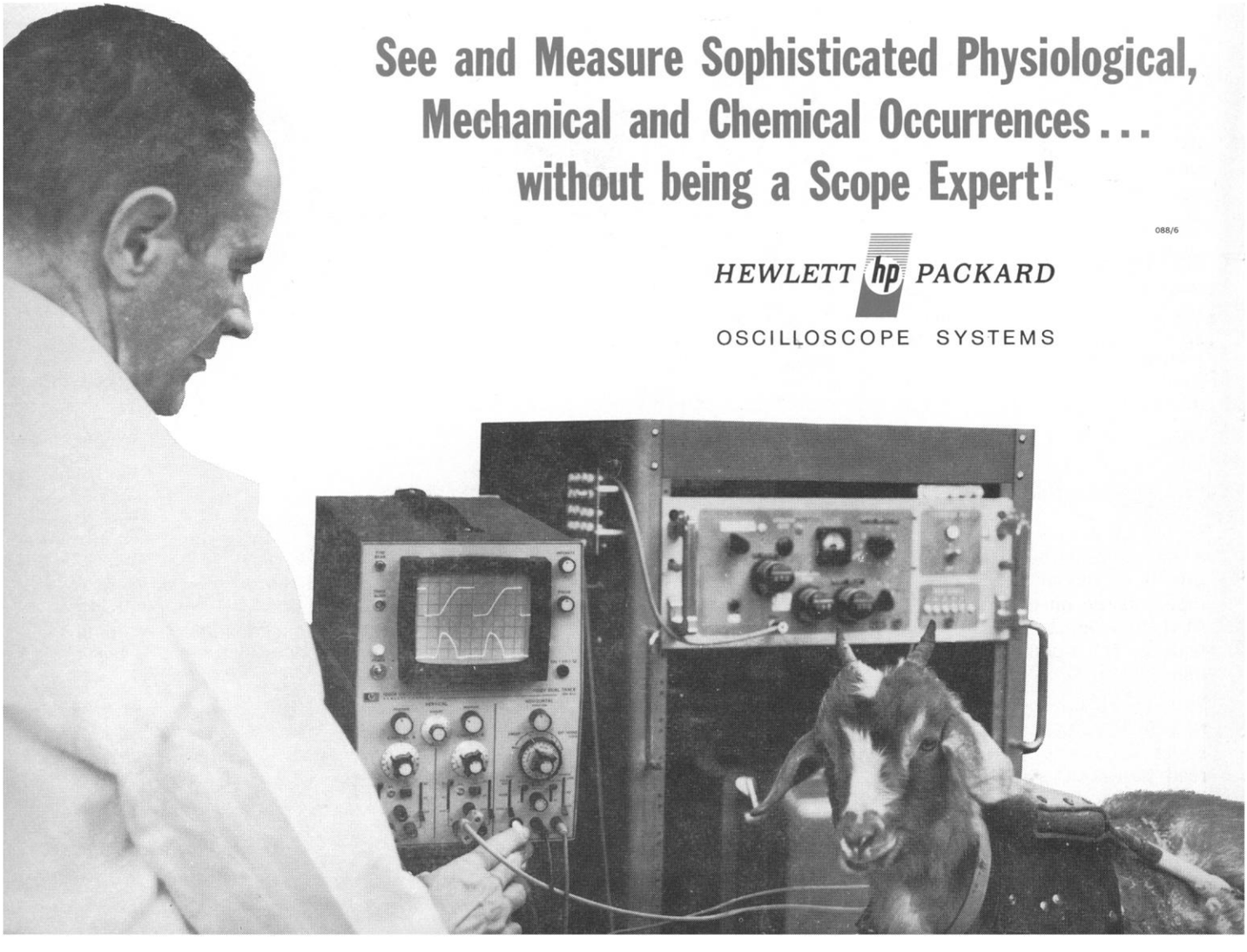
The low cost, solid state 1200 Oscilloscope System is the first state-of-the-art design to be made available to the scientific community in the last 10 years. It provides features normally associated only with the most expensive oscilloscopes. Solid state design lets you see low level signals without error-producing drift — even at the most sensitive setting; offers a lightweight rugged instrument for everyday laboratory use; and gives outstanding day-to-day performance with less maintenance and fewer adjustments—even noisy cooling fans are eliminated.

The hp 1200 Oscilloscopes are easy to set-up — the controls are grouped according to function and the dials are direct reading and interlocking to stop you from making "impossible" measurements. You see your measurement more accurately, too! The big 8 x 10 cm, parallax-free CRT displays sharp, easy-to-read traces—even in brightly lighted rooms.

The hp 1200A Oscilloscope ($990) has identical dual channel vertical amplifiers with 100 μV sensitivity. Compare and measure very low level signals without intervening preamplifiers, such as nerve potentials or sensitive transducer outputs. The CHOP mode feature displays two non-repetitive waveforms — seen before only on more expensive dual beam oscilloscopes—and you see them easier because high, 100 dB common mode rejection and a bandwidth limit switch eliminates inaccuracies caused by noise.

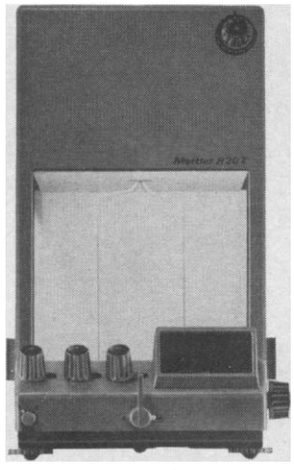
hp offers the 1200 Oscilloscope System in four different models so you can choose one to meet your measurement requirements. Select 5 mV or 100 μV sensitivity, single or dual channel vertical amplifiers, convenient cabinet style or the 5¼" high rack mount, 50 dB or 100 dB common mode rejection—price of $715.00 to $990.00. All models weigh less than 25 pounds and consume only 33 watts of power.

You can see and measure sophisticated occurrences without being a scope expert—so, call your nearest hp field engineer. He can help you choose the proper hp 1200 Oscilloscope for your measurements. Or, write to Hewlett-Packard, Palo Alto, California 94304. In Europe: 54 Route des Acacias, Geneva.



Mettler unleashes its new breed of balances on the weighing world

The six balances of the new Mettler H series are setting the weighing world on its arrestment mechanism. Five of them – three macro analyticals and two semi-micro analyticals – have full-range taring, digital data presentation and a filling guide. Of these, one also has preweighing and two have digital printout of weighing results. The sixth is an electronic balance designed to work jack-in-plug with a computer.



the new shape

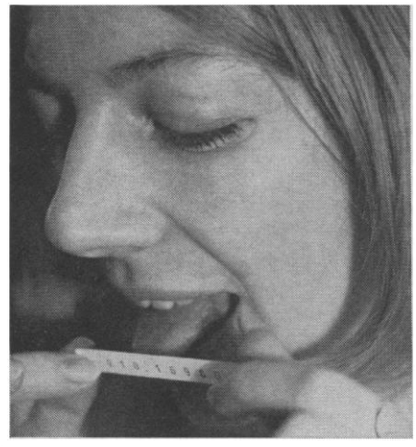
DOWN WITH ARITHMETIC

Unrestricted taring through their full capacity is a prime feature of the new analyticals. The weight of your container can be tared off in seconds, letting you begin weighing-in with the readout at zero. If you are adding several components, you can dial back to zero for each one. With all weighings beginning at zero, you just can't make a mistake. Unless you are unnecessarily obdurate.

FIRST GUTENBERG, THEN METTLER

Two of the new balances, the H10P macro and the H20P semi-micro, have the Mettler printout system. Weighing results are printed out, at the push of a button, in all-digital form. They are printed on the adhesive-backed paper tape you see on telegrams. (Mettler's Marketing Director wanted to call this feature "Tell-a-gram" but we hooted him down.)

You can affix weighing data directly to sample containers, laboratory notebooks or other records. You can't misread, transpose, or forget your weighing results.

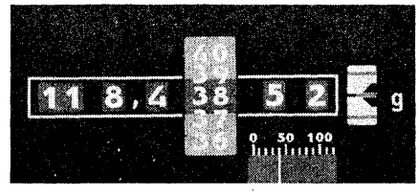


m-m-mmmm

The one thing we haven't done is to lick the tape for you – you must find a way to do it yourself. If you are too fastidious to lick it, just call a friend.

LINE UP, YOU DIGITS!

All the new analyticals have their weighing results presented in aligned, all-numerical form. This speeds reading the data and avoids errors from misreading tricky verniers and micrometers.



to 0.01 mg.

The digital readout panel and controls are conveniently grouped for easy operation and reading.

PREWEIGH OUR WAY

One instrument, the Mettler H10TW, offers improved preweighing for direct indication of rough weight. When preweighing, part of the optical scale is blocked out to avoid any risk of mistaking the preliminary value for the final result.

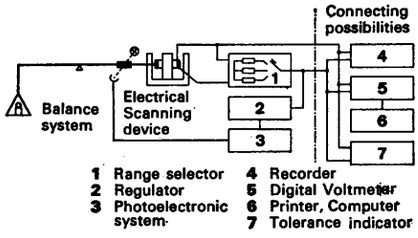
Further, the Mettler preweighing system operates over the full 160-gram range of the balance, eliminating the need for an additional dialing step if the unknown is more than 100 grams.

GUIDE TO GRACIOUS FILLING

Well over half of the hours spent before a balance are used for weighing-in. The filling guide on each of our new analyticals lets you do the job without the usual repeated interruptions. No overshooting the target weight or waiting for the optical scale to stop whizzing past . . . you proceed in orderly fashion, continuously adding your material right up to all but the final few milligrams. Our analyticals, the only ones ever to have a filling guide, can cut those hours spent at weighing-in by at least 50%.

BALANCE WITH ELECTRICAL OUTPUT

Last and most unusual of the new Mettler breed is the H20E electronic balance. It provides an analog signal for use with such instrumentation as recorders and analog-to-digital converters. It can be used to record weight changes, to code weight values into punch cards or paper tape, to print weight values by accounting machines, and to sort and control objects or processes within given weight tolerances.



Mettler H20E, figuratively

How you use it depends upon your needs – and you know them better than we do. We don't know the answers to all your problems. Just holding our position as the world's leading balance maker takes a lot out of us.

BALANCE AFICIONADOS TAKE NOTE

The redoubtable Kolthoff and Elving TREATISE ON ANALYTICAL CHEMISTRY, Volume 7 (Interscience 1967) contains a chapter that serious students, analytical chemists and research chemists might well note. Written by Lloyd B. Macurdy, Mettler's well-known staff metrologist, it is a definitive approach to the measurement of mass. History, definitions, instrumentation, units of mass, uncertainties of weighing and the elimination thereof . . . they're all there.

DO IT NOW . . .

Write for complete product literature on the new H balances. We are Mettler Instrument Corporation, 20 Nassau Street, Princeton, New Jersey 08540.

Mettler®

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SCIENCE

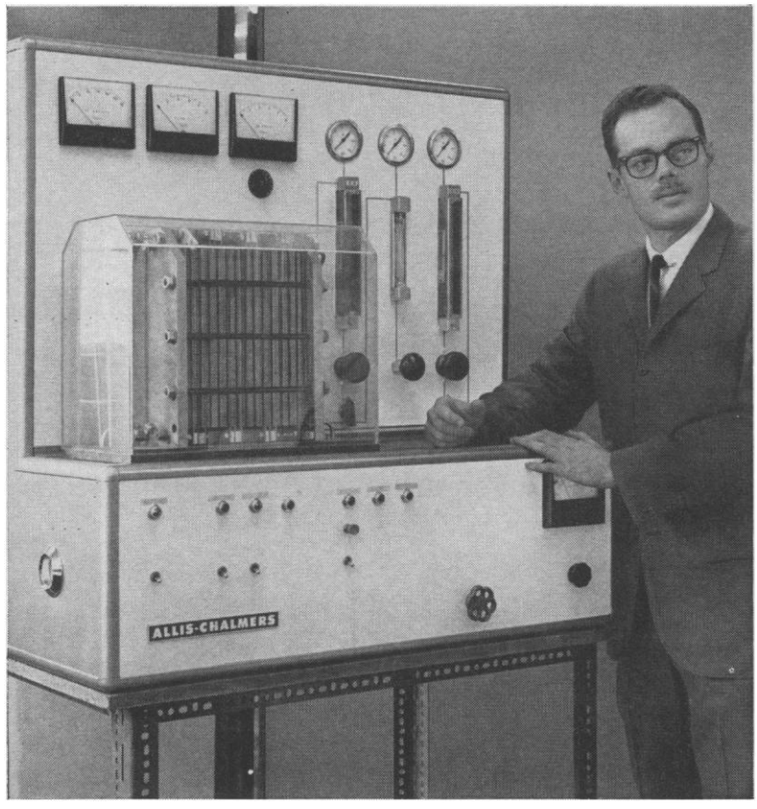
SCIENCE is published weekly on Friday and on the fourth Tuesday in November by the American Association for the Advancement of Science, 1515 Massachusetts Ave., NW, Washington, D.C. 20005. Now combined with **The Scientific Monthly**®. Second-class postage paid at Washington, D.C. Annual subscriptions $12; foreign postage: Americas $3; overseas $5; single copies, 50¢ (back issues, $1) except **Guide to Scientific Instruments**, which is $2. School year subscriptions: 9 months, $9; 10 months, $10. Provide 4 weeks notice for 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.**

COVER

(Bottom row, left to right) A sequential decrease in size and birefringence of a living mitotic spindle taken during perfusion with vinblastine ($10^{-5}M$) over a 12-minute period (about $\times$ 2700). A similar sequence can be observed in fixed tissue with a phase-contrast (middle row, about $\times$ 3000) and an electron microscope (top row, about $\times$ 7000, $\times$ 7000, $\times$ 11,000). See page 770. [Stephen E. Malawista, Yale University School of Medicine; Hidemi Sato, University of Pennsylvania; and Klaus G. Bensch, Yale University School of Medicine]

Explore

this H_2-O_2 fuel cell system right in your own laboratory . . .



Here is an opportunity made to order for research and academic laboratories . . . for demonstration and experimentation. The **Fuelectric** H_2-O_2 fuel cell is ideal for exploring fuel cell functions and applications • temperature effects • pressure effects • variable or cyclic load profiles • electrolyte concentration effects • energy balance studies.

Fuelectric uses easily handled, commercially available hydrogen and oxygen. Four models are offered . . . as completely functional packages or in semi-kit form. For full information concerning options, delivery and price, write: Research Division, Fuelectric, P.O. Box 512, Milwaukee, Wisconsin 53201.

Allis-Chalmers lets you choose from:

- Basic fuel cell module.
- Basic fuel cell module with unmounted controls and instrumentation.
- Complete fuel cell system with controls assembled, ready for operation.

FUEL CELL SYSTEM OPTIONS

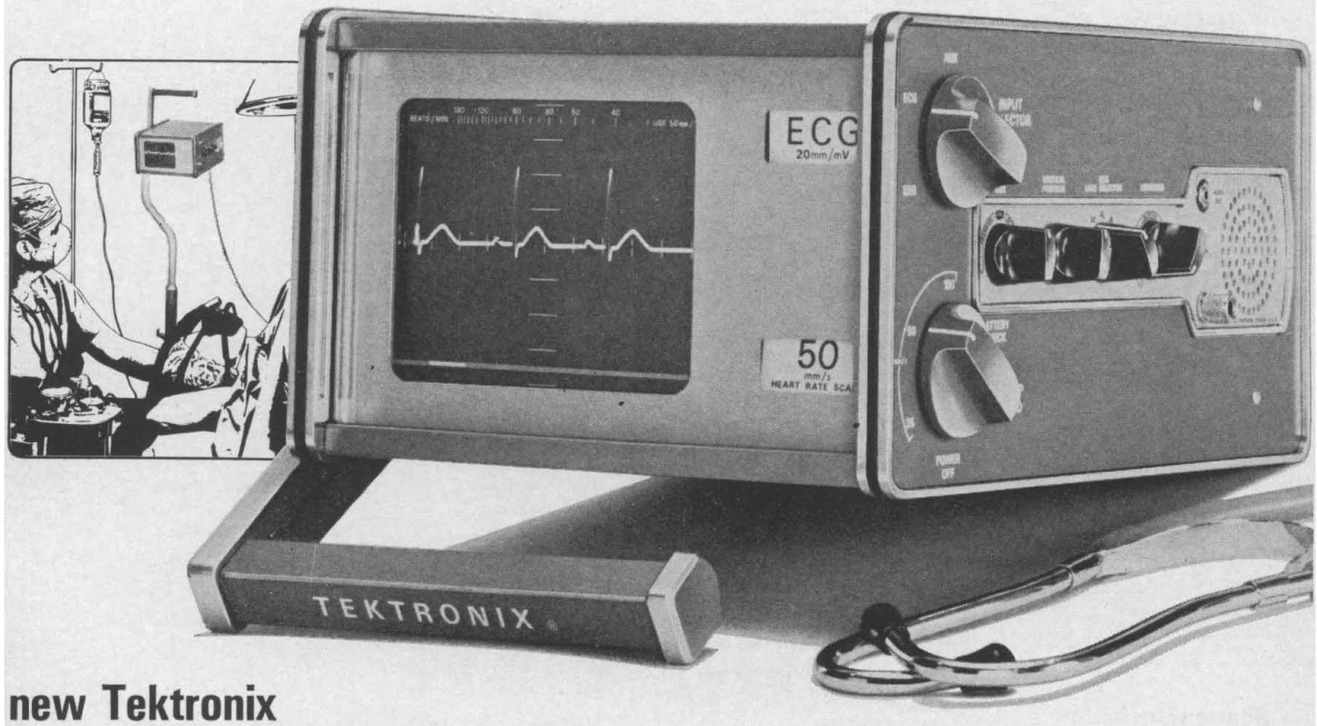
RATING	FUEL & OXIDANT	VOLTAGE	CELLS	MOISTURE REMOVAL
120 watts	H_2-O_2	1.7	4	(1) or (2)
900 watts	H_2-O_2	6 or 12	28	(1)

(1) Recirculating Liquid System (2) Static Moisture Removal

Fuelectric is an Allis-Chalmers trademark.

ALLIS-CHALMERS

small...
self powered...
easy to operate...



new Tektronix Type 410 physiological monitor

- **Battery or AC powered**
- **Clear displays of ECG, EEG or related waveforms on 5-inch screen**
- **Audible heartbeat monitor with automatic alarm**
- **Direct-reading heart rate scale**

The new Type 410 Physiological Monitor is a small, self-powered, portable instrument specially designed to monitor physiological signals in the operating room. Clear displays of ECG, EEG and other related waveforms can be viewed easily on its 5-inch (8 x 10 cm) screen.

Triggered sweep in the ECG mode always positions a QRS complex at the start of each sweep. This feature permits direct reading of the patient's heart rate on a scale scribed at the top of the viewing area. Heart rate can be determined at a glance by reading the number above the peak of the second QRS complex. (Photo shows 78 beats/min.) The Type 410 provides an audible tone at each heartbeat, with an automatic alarm if the ECG signal ceases. The alarm starts within 4 seconds after loss of signal. The sound level is adjustable and an earphone jack is provided for private listening.

Six clearly-marked controls are provided for easy operation of the Type 410. The INPUT SELECTOR determines the display mode (EEG, ECG or AUX input). THE SWEEP SPEED control turns the instrument on, permits selection of 25, 50 or 100 mm/s sweeps, and also serves as a BATTERY CHECK switch. The ECG Lead Selector provides selection of I, II, III, aV_R, aV_L, aV_F, and V leads. The remaining 3 controls adjust vertical position, vertical size and sound level.

The solid-state Type 410 is 5⅜" high, 9⅛" wide and 12⅞" long, including carrying handle. It weighs 12½ pounds, including batteries. The Type 410 "warms up" and is ready for use in less than 10 seconds. It can be operated continuously from self-contained batteries for up to 12 hours, providing isolation from power-line ground which minimizes conducted (ground loop) trace interference. AC operation and battery recharging is accomplished by simply plugging the instrument into an AC outlet. A six-pin output connector permits driving of external amplifiers or recorders.

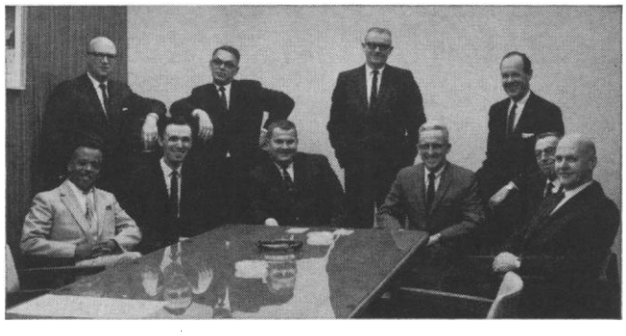
Type 410 Physiological Monitor with Accessories $825
U.S. Sales Price FOB Beaverton, Oregon

For a demonstration or a complete brochure, contact your nearby Tektronix Field Engineer or write: Tektronix, Inc., P.O. Box 500, Beaverton, Oregon 97005.

A network of field service centers

... part of the Tektronix commitment to continuing customer service

Sharing the brains



All ten men in this picture hold down jobs in the manufacture of Kodak cameras and projectors. One of them is an assistant vice-president of Eastman Kodak Company, and two of them happen to be mentally retarded. The latter two are here representing all the young adults working in the plant of a subcontractor of ours, the local chapter of the New York State Association for Retarded Children. With them are Kodak men who have used their brains to perfect procedures whereby the subassemblies produced at the Association's Work Training Center pass the same rigid reliability standards that have for generations maintained Kodak's position and reputation.

Hold back the medals. This has been going on for years, and with the physically handicapped as well. We have sacrificed nothing. The cost is the same as if the work were done in-plant. For many of the retardees the work experience has ultimately led to job placement in the community at large.

Ten good, sensible guys, all in all.

"The Big Little World of Roman Vishniac"

"Dr. [Roman] Vishniac," says an NBC news release, "regards himself as the spiritual descendant of Anton Van Leeuwenhoek, 17th century Dutch naturalist and microscopist who with his homemade microscope in 1674 discovered a great new world, the microworld." NBC News cameras have been visiting Dr. Vishniac at his Carmel, N. Y. and New York City homes, at Key Biscayne, Fla., and at Catalina Island, Calif. as he completes a series of films, "Living Biology," for the National Science Foundation. Edith Vishniac, wife and helper, helps with the human interest as NBC presents a one-hour special about a long life lived for 63 years in close knowledge of protozoa. More than half of the program will consist of stills, slides, and motion pictures by this Russian-born holder of doctorates in both zoology and medicine. The lesson: photomicrography is both science and art.

NBC promises that on the program Dr. Vishniac will explain the polarized-light technique he calls "colorization," which "transforms normally transparent organisms into vibrant mosaics of color that help to delineate their physiology . . . since every physical movement of reaction to stimuli causes a corresponding change in color." It would be well to check the color adjustments on your receiver before airtime on Friday, May 24, which for east and west will be 7:30 p.m., 6:30 p.m. central time.

We thought we ought to pay for putting this program on.

IF THEY ASKED US, WE COULD WRITE A BOOK.

When you're as deeply involved with radiochemicals as we are and have such a substantial commitment to the field, you find yourself offering your customers a lot of different kinds of useful literature.

Which is, perhaps, inevitable. We feel strongly that you—the user of our compounds—should be able to find what you need to know. Black on white.

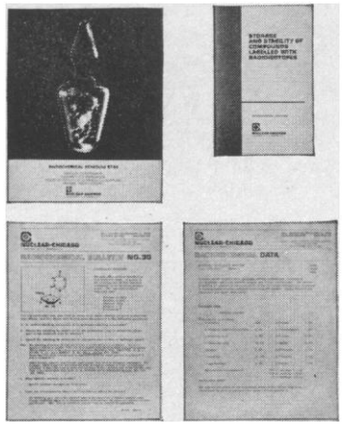
So we make available and freely distribute a considerable variety of printed materials. You may not want one of everything, but everything is yours for the asking.

One thing you *will* want is our **Radiochemical Schedule.** Where else would you find such a complete listing of C14, H3, P32, and S35 compounds? Plus hundreds of new, higher specific activities and hundreds of new, lower prices.

We also put out, on a continuing basis, our series of **Radiochemical Information Booklets.** They're authoritative, up-to-date, and indispensable. You'll want a list of current titles. Ask.

Our **Radiochemicals Bulletins** are just that—bulletins. Containing hot, hard news of new products, changes in our listings, whatever's happening.

With every compound you order from us there is, of course, a **Radiochemical Data Sheet.** It's sort of a biography of the compound—its method of preparation, results of the tests it's undergone, storage and stability data, etc.

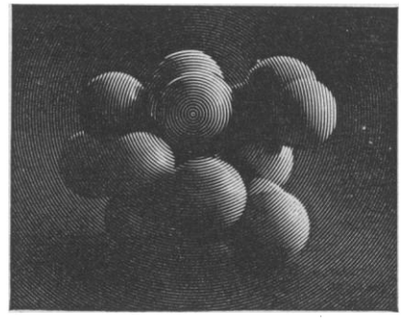


Since we're always looking for new ways to inform, enlighten, *help* you, there's always something hot off the press. Such as our new **Radiochemical Users Guide.** It's written to clarify such subjects as the storage of a radiochemical, the opening of its ampoule, as well as transferring it to another container.

And if there's anything else you'd like to have in the way of printed materials—bibliographies, abstracts, or you-name-it—we can help. Just call or write us.

That's a good idea anyway. Because when you call or write us, we'll put you on our mailing list. You'll start receiving all the publications we've talked about.

RADIOCHEMICAL REVIEWS

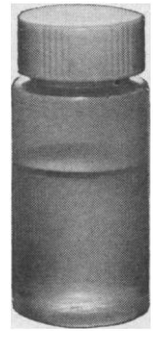


NUCLEAR-CHICAGO CORPORATION

A SUBSIDIARY OF G. D. SEARLE & CO.
349 E. Howard Ave., Des Plaines, Illinois 60018

(312) 296-1055
Direct Radiochemical Telephone (Call Collect)

A NEW LIQUID SCINTILLATION COUNTING VIAL: IT'S NYLON.



Our new *nylon* Spectravial™ is the ideal vial for liquid scintillation counting. Here's why:

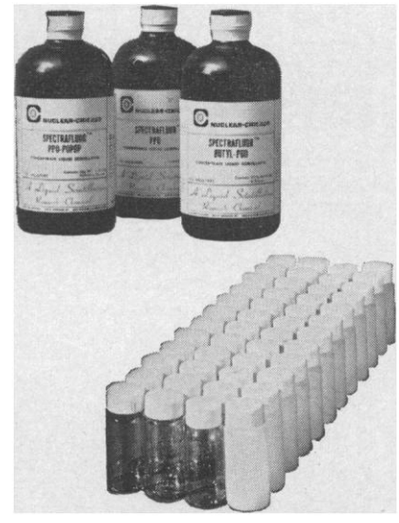
1. Higher counting efficiency than even the highest quality glass vial.
2. More than a 50% increase in E^2/B when compared to the highest quality glass vial.
3. Lower background than any glass vial (lower than most polyethylene vials, too).
4. Excellent for both high- and low-activity counting.
5. Not permeable to toluene.
6. Unbreakable, of course.
7. Made to our own rigid quality-control standards, as well as MIL specs.
8. Lower in price than high-quality glass vials.

Sound good? Then why not call or write us for more information (including prices) on our nylon Spectravial.

NUCLEAR ACCESSORIES AND SUPPLIES WITH OFF-THE-SHELF DELIVERY.

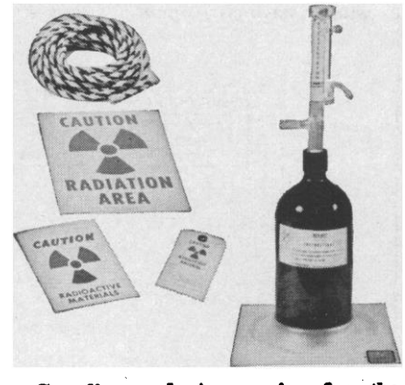
The "little" things (like vials, chemicals, etc.) can make a big difference to you. Especially if you need them in quantity. And in a hurry.

We can help here, too. What follows is a very condensed listing of the nuclear accessories and supplies we stock for immediate delivery.



Liquid Scintillation Supplies and Accessories: Vials—glass, polyethylene, and (new) nylon. Vial replacement caps. Vial storage cabinets (and trays for same.) Premixed scintillators, solubilizers, and chemicals. Primary and secondary fluors. Sample-preparation manuals. Liquid scintillation standards. Group counting plugs.

Gamma Scintillation Supplies and Accessories: All popular sizes of sample bottles and test tubes.



Supplies and Accessories for the Nuclear Laboratory: Warning tapes, signs, stickers, rope. Protective gloves, shoes, coveralls. Disposal containers. Lead bricks. Griptongs and Posigrip tools. Pipettes and automatic dilutors. Sample pans. Counting gas and regulators. Windows. Reference sources. G-M tubes. Dosimeters and chargers. Chart paper, printing paper, ink, and ribbons. And much, much more.

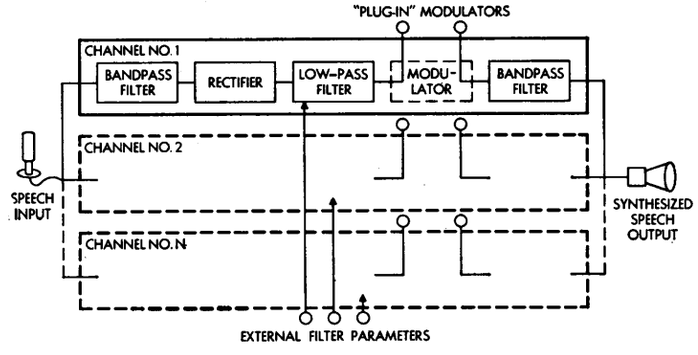
Since we obviously can't list everything here, please write for your copy of our new Supplies and Accessories Catalog.

Report from

BELL LABORATORIES

Breadboarding the modern way

Scientist Barry J. Karafin of Bell Laboratories checks chart recorder waveforms from a BLODIB simulation. Karafin uses the computer console at his right to interact with the simulation program. This feature was developed for the BLODIB program to give users the flexibility of making changes in such things as component values without having to re-program an entire system.



A hypothetical voice-analyzing/synthesizing system (resembling Bell Laboratories' "vocoder")... and how it might be simulated with BLODIB. The system would have a number of band-limited channels, each consisting of such blocks as BANDPASS FILTER, RECTIFIER, and LOW-PASS FILTER. Once the experimenter specifies one channel, he can call upon it, complete, as many times as necessary. Such a system analyzes a voice input into "channels" (narrow frequency bands). It then synthesizes (recombines the channels) so that the speech output can be heard on earphones or over a loudspeaker. It might be used to test relationships between channel width and intelligibility. To experiment with various MODULATORS, the user can leave "open terminals" (blank sections) in the program and "plug in" (supply sub-programs for) simulated modulators. The LOW-PASS FILTERS have externally variable parameters, such as cutoff frequencies; these parameters may be supplied by a user during simulation or by another computer program.

More and more, engineers use digital computers to simulate new electronic systems. It's often faster and cheaper than breadboarding . . . building an experimental system.

But simulation is most useful if the experimenter can "talk" to the computer in his own language . . . a block diagram symbolizing an electronic process. To translate such a diagram into a computer simulation program, scientists at Bell Telephone Laboratories designed an intermediate program or "compiler." The latest version is called BLODIB for BLOck Diagram compiler B (pronounced "Bloody Bee"). BLODIB's output is a simulation program—in machine language.

The BLODIB user needs little programming experience. He writes a description of a block diagram and its connections in terms from the BLODIB dictionary . . . which contains abbreviated names for most blocks, such as AMP for amplifier. The description need not follow signal flow; BLODIB arranges it properly.

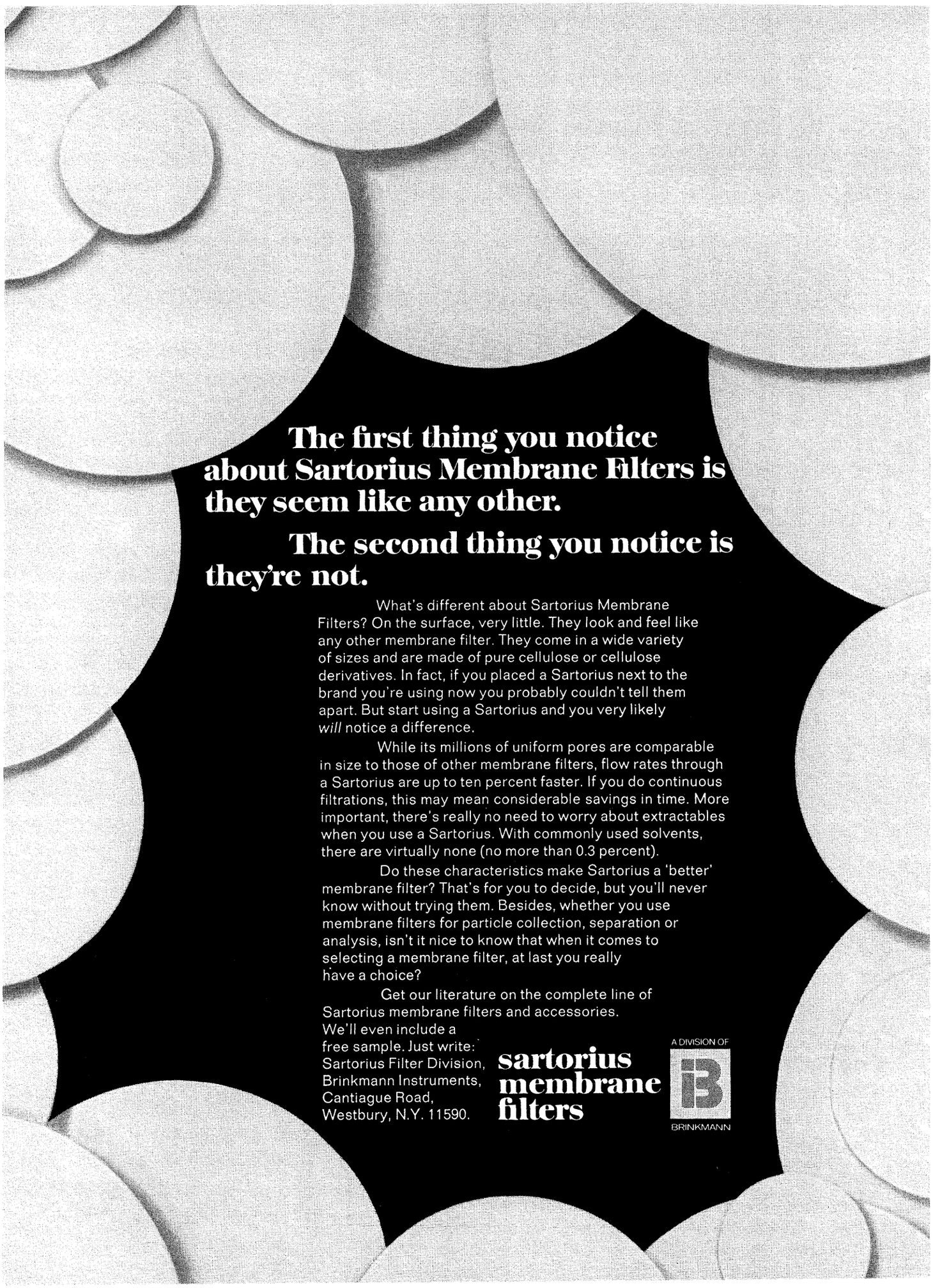
The BLODIB dictionary cannot contain a block for every possible electronic function. But many new blocks can be built up from those available. And, if one combination will be used many times in a design, it can be named and used as often as necessary.

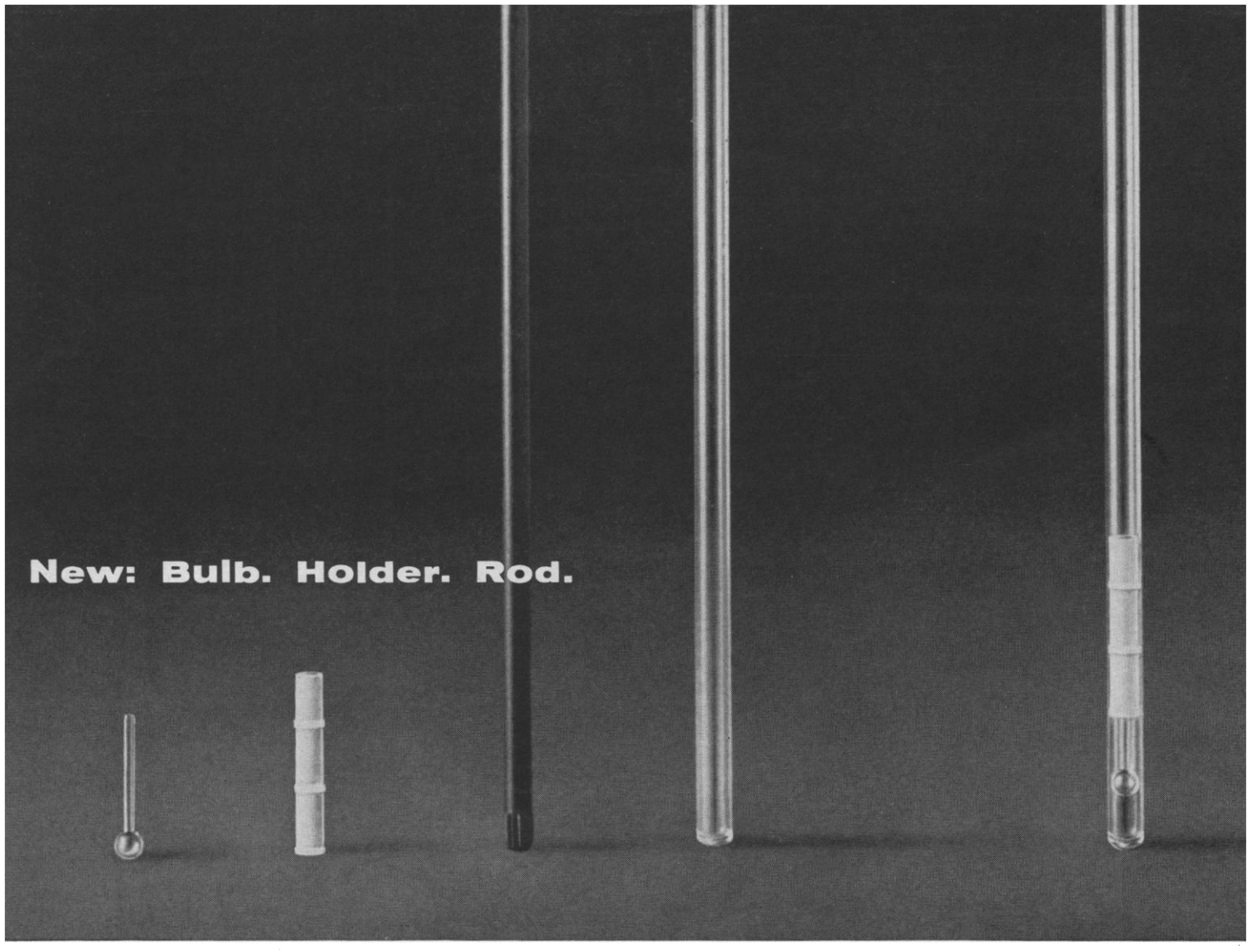
To test prototype systems, the experimenter can leave parameters variable, or he can even arrange for their values to be supplied by another computer program for automatic simulation throughout a range of settings. Also, if he is doubtful about, say, a filter, he can simulate his system without the filter and "plug in" simulation programs for various experimental filter designs. In this way, several designs can be tested before investing in a laboratory model.

The BLODIB program has been used to simulate acoustical and visual systems and was recently used to study automatic equalization techniques for Bell System data sets.

The first block-diagram compiler, BLODI, was conceived and developed at Bell Laboratories by V. A. Vyssotsky, John Kelly, and Carol Lochbaum. B. J. Karafin recently formulated the BLODIB program which extends the original BLODI program so it can interact with non-BLODI programs and provide the flexibility described above. This makes it an even more powerful tool for probing potential systems over a broad range of operating conditions.

Bell Telephone Laboratories
Research and Development Unit of the Bell System


The first thing you notice about Sartorius Membrane Filters is they seem like any other.
The second thing you notice is they're not.
What's different about Sartorius Membrane Filters? On the surface, very little. They look and feel like any other membrane filter. They come in a wide variety of sizes and are made of pure cellulose or cellulose derivatives. In fact, if you placed a Sartorius next to the brand you're using now you probably couldn't tell them apart. But start using a Sartorius and you very likely will notice a difference.
While its millions of uniform pores are comparable in size to those of other membrane filters, flow rates through a Sartorius are up to ten percent faster. If you do continuous filtrations, this may mean considerable savings in time. More important, there's really no need to worry about extractables when you use a Sartorius. With commonly used solvents, there are virtually none (no more than 0.3 percent).
Do these characteristics make Sartorius a 'better' membrane filter? That's for you to decide, but you'll never know without trying them. Besides, whether you use membrane filters for particle collection, separation or analysis, isn't it nice to know that when it comes to selecting a membrane filter, at last you really have a choice?
Get our literature on the complete line of Sartorius membrane filters and accessories. We'll even include a free sample. Just write: Sartorius Filter Division, Brinkmann Instruments, Cantiague Road, Westbury, N.Y. 11590.
sartorius membrane filters
A DIVISION OF
BRINKMANN



We just made NMR analysis easier.

We designed this unique new analytical tool to complement our extensive line of high quality NMR Tubes.

It's called a Microcell Assembly* and it's perfect for people who have only 30 ul or less for NMR Spectroscopic Analysis.

Use a standard length syringe. Put your sample in the Microcell bulb. Fit the bulb stem into the Teflon® holder. Screw on the nylon rod. Fill our special ultra-precision tube with a fluid to minimize wobble. (Clearance is minimal—0.1 mm). Insert the whole assembly into the tube.

®Trademark of Du Pont

Unscrew the rod and withdraw it.

Analyze.

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*Applied Spectroscopy, May-June, 1967, Vol. 21 #2, "Microcell for Nuclear Magnetic Resonance Analysis", R. A. Flath, N. Henderson, R. E. Lundin, and R. Teranishi.

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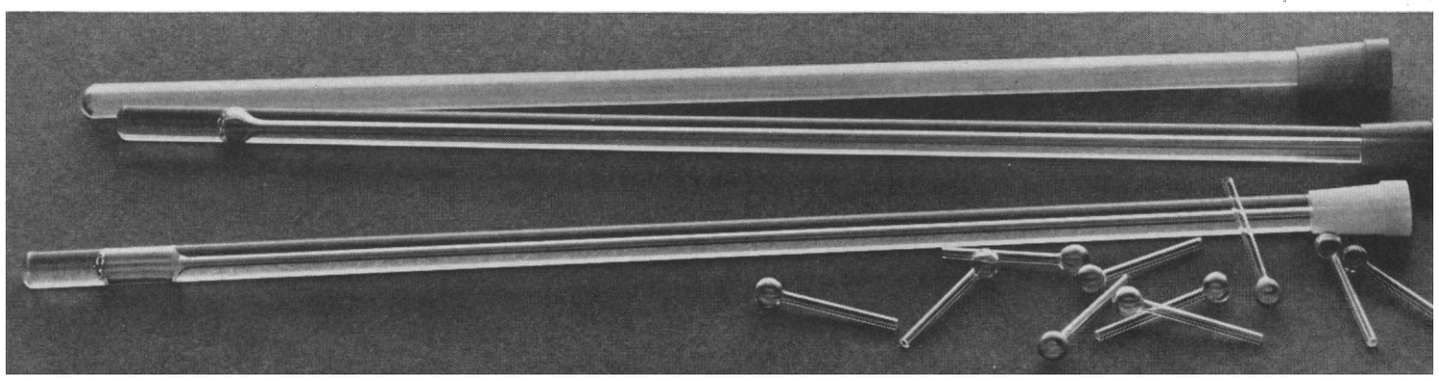

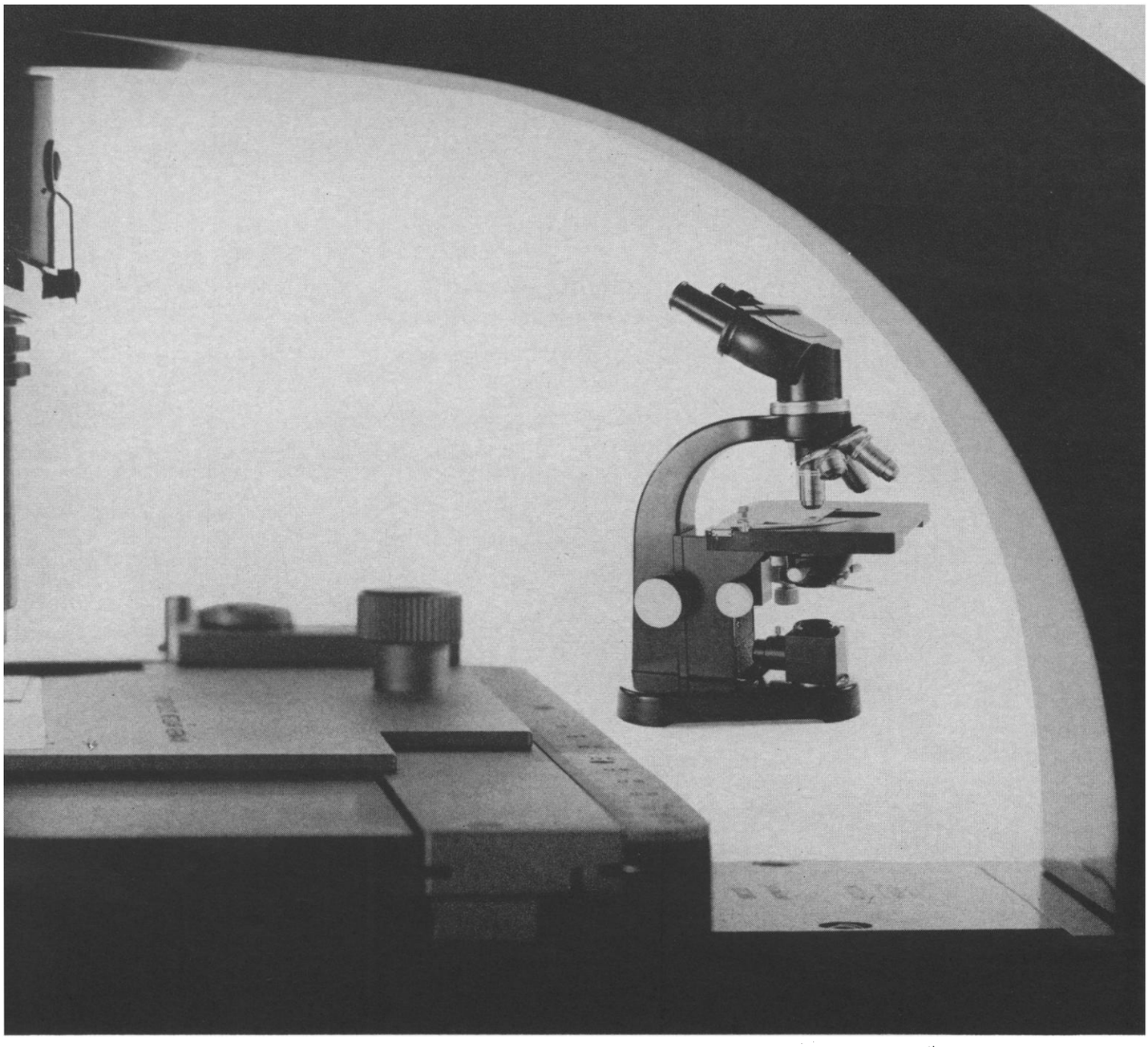

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SCIENCE

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Effects of Cuts in Federal Support of University Research

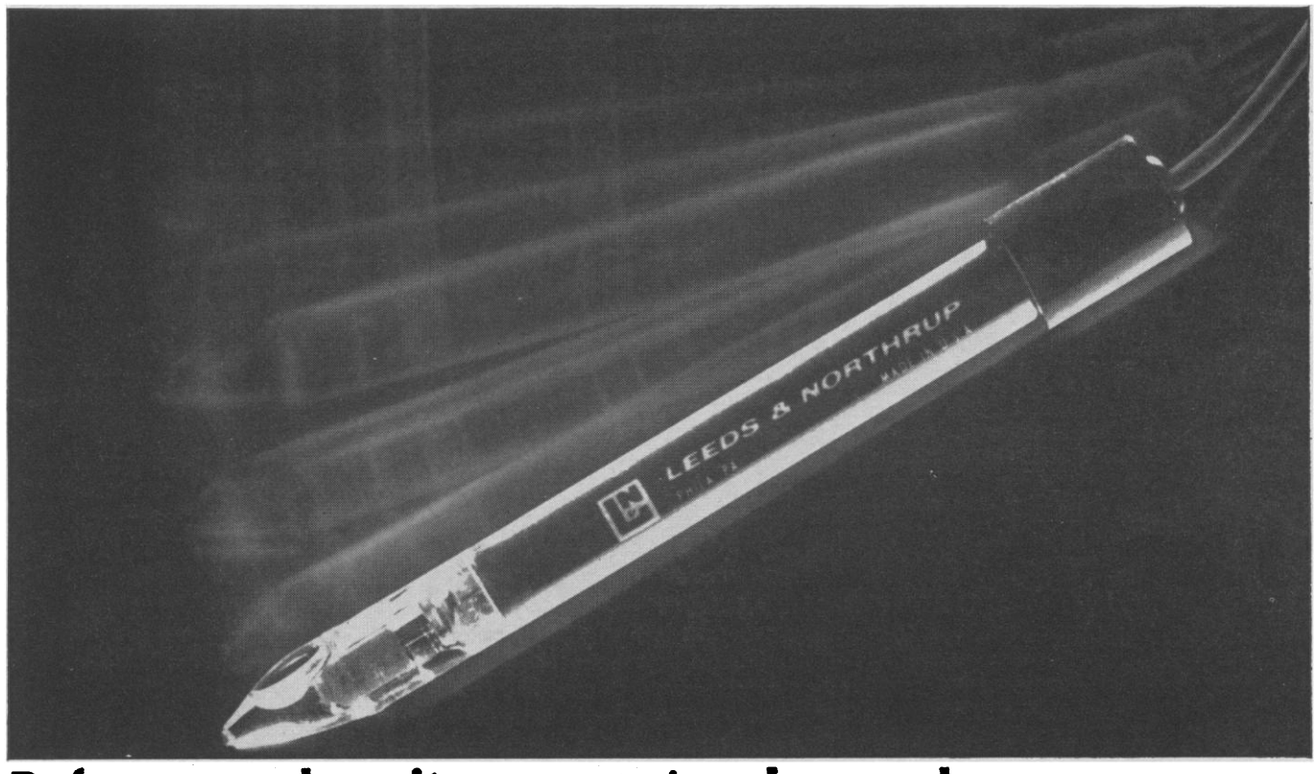
Universities are dependent on federal funds. Some state-supported schools derive 30 percent of their total budgets from the federal government. Science departments of such institutions obtain most of the money needed for graduate training as a by-product of support for research. Many private institutions are heavily dependent on government funds. Some obtain more than 80 percent of their budgets from Washington. Funds for the conduct of research and for graduate training at even the highly endowed schools come almost entirely from federal sources.

With this background in mind, I recently asked administrators at 12 great universities for their estimates of the effects of proposed cuts in the federal support of research. All responded frankly and indicated that the consequences of cuts had been under study at their institutions. They were gravely concerned and felt that heavy damage to their schools and to higher education might occur. All agreed that they would give a high priority to meeting commitments to their staff and said that, even if there were no federal funds for research, they would provide for the tenured faculty. The reduced population of graduate students on campus next year will probably be supported. Most vulnerable to effects of cuts are the postdoctoral fellows and technical supporting staff. A cut in federal support would result in a much larger drop in research output. Postdoctoral fellows are among the most creative scholars on campus. Without supporting technical staff, the complex equipment vital to modern research would be inefficiently used. Operating under restricted budgets, the professors would eschew chancy initiative involving new equipment in favor of safe investigations employing items already at hand.

While the most disruptive effects of a budget cut would be manifest in the science departments, the entire faculty would feel stringency. For example, at one top private university, the annual cost of operating the computer center is $3 million. This cost, which is highly inelastic, is met by users supported on government grants and contracts. A drop in federal funds would exacerbate the institution's deficit during the next fiscal year. The deficit would deepen for another reason. The university is geared to handle a certain volume of activity. It will be difficult to reduce overhead costs quickly enough to avoid further deficits if federal funds are diminished.

At a number of large state universities, overhead from federal grants has had catalytic effects. Legislators are willing to pay for cutting the grass but not to provide for large items of equipment or funds for new initiatives. Some university administrators have been able to retain control of overhead on grants. These funds have been used for computer facilities, matching funds for construction of science buildings, and even support for the humanities. One vice president told me that a first casualty resulting from a drop in support of the physical sciences would be new studies of urban problems.

Federal support of research buys more than research. It pays for graduate education, leads to improved teaching of undergraduates, and facilitates initiatives. In deploring budget cuts, university administrators have a good case, and they should be listened to.—PHILIP H. ABELSON



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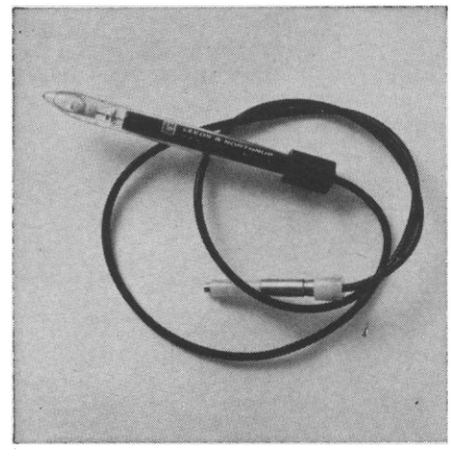

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a visiting professor at the University of Chicago from the University of Warsaw, Poland, reported results proving his ability to make the most accurate computations to date on the simplest molecules, particularly the hydrogen molecule. Using a large computer at the University of Chicago, Kolos has been able to determine the stability and size of the molecule by making accurate computations of its binding energy.

Some new ideas on the treatment of electron scattering by atoms were reported by Frank H. Harris of Stanford University and Harvey H. Michels, United Aircraft Research Laboratories, East Hartford, Connecticut. The results reported on simple systems agree well with results of other methods and the new ideas seem to have great promise and application to much more complicated situations, even electron scattering by molecules.

Bernd T. Matthias, University of California, La Jolla, put forth some theories, followed by substantiating data, to show that superconductivity is more complex than was previously thought. He reported experimental evidence for the existence of at least four types of superconductors. Some had isotope effects; others had negative or positive characteristics; and some had no isotope effects.

Matthias discussed the mechanism of phonon interaction, the valence-electron mechanism found in certain transition metals, the *f*-electron mechanism in lanthanum and uranium, and finally the new exciting results found in metal borides.

The quantum theory institute, held annually at the University of Florida since 1960, opens in December for 4 weeks on the Florida campus. It then moves to Sanibel Island for 3 weeks. The final week is divided between the institute and the symposium.

During the last week, scientists held a discussion on the role of the scientist in modern society. These observations were made:

1) Society does have a right to know where its money is being spent; thus it is necessary that a certain amount of science must be applied to practical results.

2) The scientist also must be given a degree of time to pursue knowledge for the sake of knowledge itself.

3) There is a danger that society's demand for application may result in government and industry reducing support for basic research.

4) Scientists need a strong organization that will provide them with negotiating strength and the tool to tell their story to the public.

5) The better students are being attracted to the more exotic fields of science, and the basic sciences are suffering as a result.

IRV EDELSON
Division of Information Services, University of Florida, Gainesville

Calendar of Events

Courses

Images and Words, Santa Cruz, Calif., 1–13 July. Intended for photographers, writers, editors, historians, museum curators, and others who need a basic knowledge of the principles and techniques involved in making and procuring photographs for publication, preparing captions, and combining them with text. Fee: $175 (does not include housing and meals). (University of California Extension, Santa Cruz 95060)

NATO Advanced Study Institute in Psychogenetics, University of Birmingham, England, 5–18 September. Is intended primarily for graduates in psychology or genetics or allied fields. Discussions and practical work will cover the main approaches to the problems of behavioral inheritance as displayed in a variety of organisms, including man. (Professor P. L. Broadhurst or Professor J. L. Jinks, P.O. Box 563, University of Birmingham, Birmingham 15, England)

Iterative Analog Computation, Rolla, Mo., 24–28 June. Topics will include the configurations and control of the operational amplifier, digital logic components, the interface components which establish analog logic communications, and process engineering problem solutions on the parallel hybrid computer. Participants should hold at least a bachelor's degree and should be familiar with programming and operating analog computers. Fee: $175. (Extension Division, University of Missouri-Rolla, Rolla 65401)

Current Trends in Automatic Control Theory, St. Louis, Mo., 19–24 Aug. Included will be some of the latest topical areas of modern control theory. The prerequisite mathematical level will be a good M.S.; however, lectures will be conducted in a manner suitable for stimulating advanced research workers. (Dr. G. L. Esterson, Box 1048, Institute for Continuing Education in Engineering and Applied Science, Washington University, St. Louis, Mo. 63130)

Analysis of Settlement in Soils, Madison, Wis., 17–21 June. The course, which is intended for practicing engineers and contractors, will consider approaches to the determination of stresses and displacements in soil masses, as well as methods of analyzing total soil settlement. Fee: $150. (Dr. Dwight D. Zeck, Course Coordinator, University of Wisconsin-University Extension, 432 North Lake St., Madison 53706)