14 December 1984 • Vol. 226 • No. 4680 $2.50

SCIENCE

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Meet the new J-6M/E large-capacity refrigerated centrifuge!

It offers some of the best features of our other two 6000-rpm models — the microprocessor controls of the top-of-the-line induction drive J-6M and the economy of the dc-drive J-6B analog model.

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JE-6B Elutriator Rotor.

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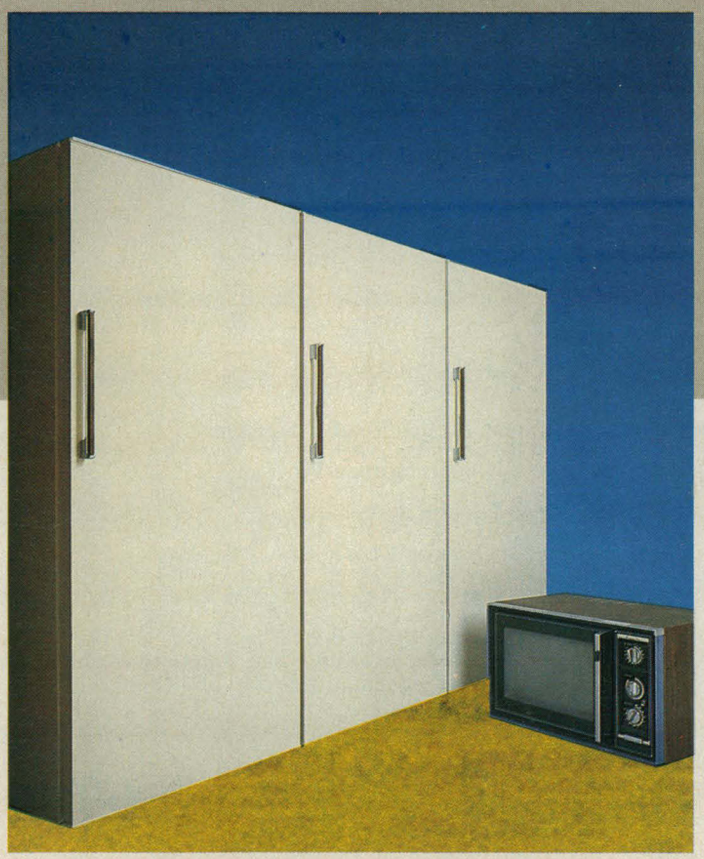

Mainframe computational speed in a compact package about the size of a microwave oven. That's the new MAP-6420 array processor. Now computation for scientific and engineering tasks doesn't demand three refrigerators' worth of real estate. Now it doesn't require special air-conditioned rooms. And now, for the economical price of $100,000, you can boost the speed of your host computer into the mainframe class.

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MAP-6420™

FORTRAN Programmability: If you know how to program in FORTRAN, you already know how to get high performance from the MAP-6420. We planned MAP's hardware around its FORTRAN compiler so that programs you write will deliver the performance you paid for. Parallel units process algorithms efficiently, even if they're not vector-oriented. Uniform, versatile performance delivered from FORTRAN—that's MAP-6420.

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

Basic oxygen furnace beneath ladle tilted to the charging position to receive the liquid hot metal portion of the charge before refining iron into steel. Energy-intensive industrial processes are in a state of transition, both technologically and in the demand for their products. This has implications for future energy demand and the changing composition of U.S. industrial production. See page 1277. [U.S. Department of Energy, Washington, D.C. 20585]

THE U.S. ARMY MEDICAL RESEARCH AND DEVELOPMENT COMMAND IS ACCEPTNG PROPOSALS FOR RESEARCH IN DRUG DEVELOPMENT AGAINST VIRAL DISEASES OF MILITARY IMPORTANCE (SYNTHESIS)

DAMD17-85-R-0010

There is a need for drugs which are useful as treatment or prophylactic drugs against life-threatening viral diseases. Drug development program emphasis is on the development of prophylaxis or therapy for U.S. military personnel considered to be at risk of infection by natural and/or altered microorganisms. In order to find such drugs, appropriate chemicals are needed for testing. Specific areas of interest are:

a. Synthesis of compounds as potential drugs useful against viruses of flavi-, alpha-, bunya-, arena-, and adenoviruses. Of special interest are compounds which will be effective against hemorrhagic or encephalitic diseases. Compounds with broad spectrum antiviral activity are of most interest.

b. Synthesis of compounds to be selected for testing by the COTR and a compound selection panel based on consideration of existing research data and scientific literature, modern techniques of drug design, structure activity relationships, present knowledge of viral pathogenesis and immunology, pharmacokinetics of drugs, and mechanisms of action of antiviral drugs.

Proposals may be submitted for one or more of the above topics or a specific portion of one topic. A proposer may submit separate proposals on different topics or different proposals on the same topic.

In accordance with the Federal Acquisition Regulation (FAR) any contracts awarded under this solicitation may be of any type or combination of types which will promote the best interests of the Government. It is anticipated that multiple-year, incrementally-funded, level-of-effort type, cost reimbursement contracts will be awarded. Each increment will be approximately 12 months. Duration of the contract should be commensurate with the proposed scope of work but in no case shall exceed five years.

PROPOSAL PREPARATION INSTRUCTIONS AND REQUIREMENTS

Proposals shall include a table of contents and should cover the points cited below, insofar as they are applicable.

a. *Name and Address of Organization.* At least one copy must carry the original signature of an official authorized to legally bind the organization.

b. *Title of Proposed Research.*

c. *Description of Proposed Research.* Submit a detailed description of the research objectives or range of capabilities for synthesis of antiviral compounds, including a specific scope of work. The description will also include a chemical/biological rationale for a specific list of target structures, and detailed references and reasonable proposed routes for the synthesis of the compounds. No cost information shall be included in the technical proposal.

d. *Research Involving Human Subjects.* No research involving human subjects will be considered.

e. *Research Involving Animals.* No research involving animals will be necessary.

f. *Personnel.* Qualifications of the principal investigator and other senior professional personnel and the time each will devote to the research. This information, to the extent that it is information about an individual, is subject to the requirements of the Privacy Act of 1974 (5 USC 552(a)). The principal purpose and routine use of the information are for the evaluation of the qualifications of those persons who will perform the research. Disclosure of the information is voluntary, but failure to provide such will prevent evaluation of the proposal.

g. *Facilities and Equipment Available.*

h. *Cost Estimate.* An estimate of the total research project cost with a breakdown of funds by cost category (direct labor cost, indirect cost, property or equipment cost, travel cost, publication cost, consultant cost, other direct cost, fee or profit) by year must accompany each proposal and must be submitted on Standard Form 1411 with complete supporting information. *No cost information shall be contained in the technical proposal.*

Every effort will be made to protect the confidentiality of the proposal and any evaluations. The submitter may mark the proposal with a legend such as that provided in FAR 52.215-12. Proposals containing a more restrictive legend shall not be considered.

Unnecessarily elaborate brochures or presentations beyond that sufficient to present a complete and effective proposal are not desired.

CONSIDERATIONS

Submission of Samples. Up to 300 compounds are to be prepared each year in sufficient quantity such that three to ten grams can be submitted to the USAMRDC through the COTR for testing. They are to be accompanied by a completed data sheet (WRAMC Form 108) and appropriate analytical and spectral data. Selection and priorities for synthesis and appropriateness of submissions will be determined in consultation with the COTR and be consistent with recommendations of a compound selection panel, composed of the COTR, consultants and in-house scientists.

Reports. Quarterly, annual and final progress reports shall be required in accordance with the schedule of any resultant contract. Reprints of any publications resulting from sponsored research shall also be provided to the USAMRDC.

Contract Provisions. Contracts awarded shall contain, where appropriate, detailed special provisions concerning patent rights, rights in technical data and computer software, reporting requirements, equal employment opportunity, care of laboratory animals, use of human subjects, good laboratory practices requirements, acquisition and disposition of equipment, and other requirements. Contracts shall also incorporate all general provisions required by the FAR, DoD FAR Supplement and Army FAR Supplement.

METHOD OF SELECTION AND EVALUATION CRITERIA

Proposals will be evaluated first on their relevance to military and program requirements. Those found to be relevant will then be evaluated on a competitive basis by a collective discussion conducted by review committees composed of scientists knowledgeable in the topic area. Proposals will be evaluated first on their relevance to the chosen topic. Scientific acceptability will be determined by using the following criteria:

a. *Technical Approach.*

1. If the offeror proposes to synthesize specific compounds, is the rationale sufficiently sound such that there is a reasonable expectation that the new compounds will lead to improved utility for the proposed use? Is it well documented or based on samples of tested analogs?

2. If the offeror proposes to synthesize compounds recommended by the compound selection panel is the proposed technical approach adequate as evidenced by:

(a) Proposed solutions to potential problems.
(b) Ingenuity of approaches to process development.
(c) Flexibility and capacity for the synthesis of a broad variety of compounds.

b. *Soundness of Synthetic Chemistry.* Are examples of proposed synthetic routes well planned, logical, well referenced? Will they very probably lead to successful production of target compounds in a timely manner? Is experience in process development of synthetic medicinal compounds demonstrated? Are examples of accomplishments in the field pertinent?

c. *Competency of Key Personnel.* Are the proposed personnel qualified to do the work? Does past experience and/or training indicate probably success?

d. *Quality of Available Facilities and Equipment.* Are they appropriate to accomplish the job? Are safety factors properly considered? If shared with other projects, what are the priorities established for use? If additional facilities and equipment are needed, are those proposed appropriate?

After determination of scientific acceptability, the Source Selection Board will determine the competitive range according to program requirements, scientific acceptability, and cost to complete contract. Although cost will be a factor in the selection, program relevance and scientific acceptability will be more significant factors in selection for contractor award. Further, the proposed cost must be realistic, reasonable, and fully justified in all categories to be selected for contract award.

Negotiations will be conducted with those contractors in the competitive range, i.e., those who satisfactorily meet the above criteria. Final decisions for funding will be based upon these criteria and consideration of duplication of other research as well as program balance. The Government may elect to fund several or none of the proposed approaches to the same topic. There is no commitment by the Government to make any awards on any topic, to make a specific number of awards or to be responsible for any monies expended by the proposer before award of a contract. It should be noted that only a duly appointed Contracting Officer has the authority to enter into a contract on behalf of the US Government.

SUBMISSION OF PROPOSALS

Ten (10) copies of the complete technical and cost proposals are required for review and evaluation. Proposals must be received at the address below not later than 4:00 p.m. on January 14, 1985:

Director
US Army Medical Research Acquisition Activity
ATTN: SGRD-RMA-RC/DAMD17-85-R-0010 (Shackelford)
Fort Detrick, Frederick, Maryland 21701-5014

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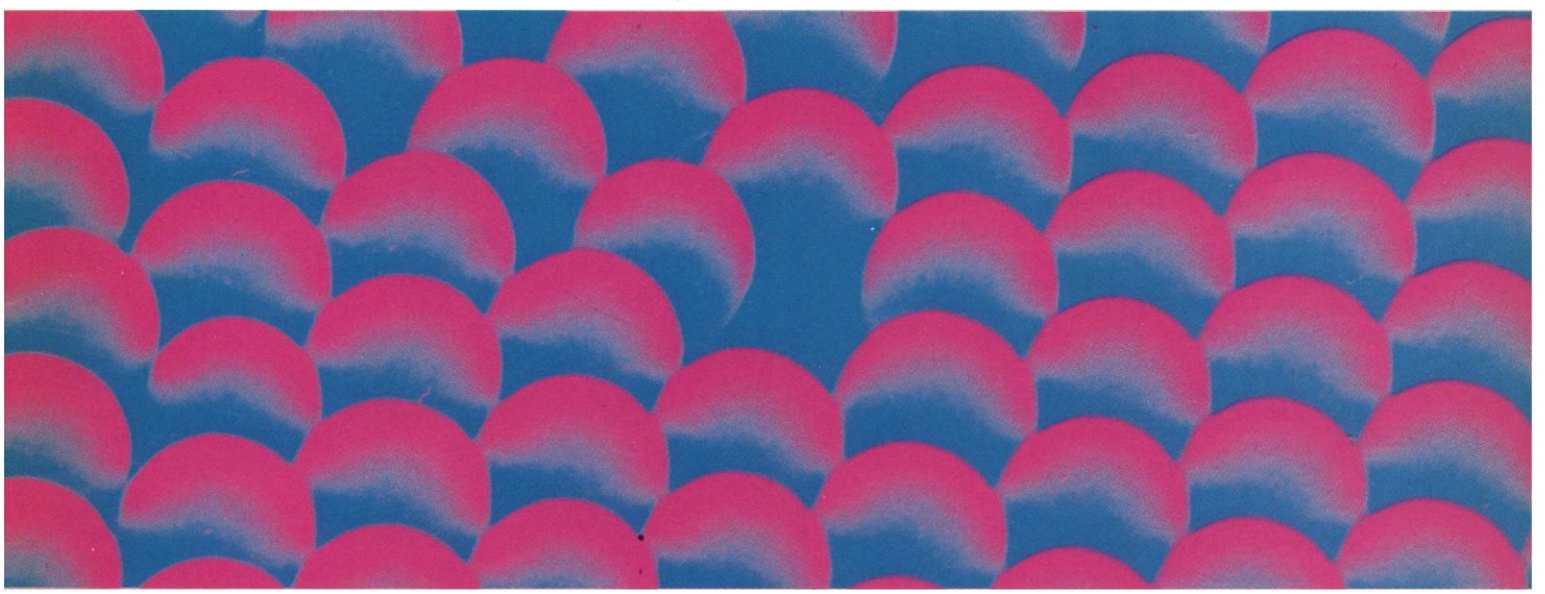

You're looking at an electron micrograph of MonoBeads™—the most significant advancement in separation technology since the discovery of Sephadex.® And it's the MonoBeads which give a magical high performance to our new Fast Protein Liquid Chromatography (FPLC) System.

With a uniform particle size of 9.8 µm, this new hydrophilic, monodisperse medium is the secret of high performance.

High resolution of complex biological samples such as proteins, peptides, enzymes, monoclonal antibodies and polynucleotides can now be conjured up with typical separation times of 10-20 minutes.

A small selection of the substances which have already been studied using the FPLC System.

Bacitracin.	Tryptic peptides.	L-amino acid oxidase isoenzymes.
Monoclonal antibodies.	Haemoglobin $A1_C$.	Restriction enzymes.
Serum proteins.	Haemoglobin chains.	Labile citrate synthase.
Urine proteins.	Insulins.	Placental homogenate.
Synthetic oligonucleotides.	NADP.	Steroids.
Viral proteins.	Venoms.	
Membrane proteins.	Pollen extracts.	
	Ovalbumin.	
	Gc-globulin.	

When we had perfected the separation media, we turned our attention to the instrumentation. And we designed a system which represents the state of the art in protein separation technology.

We've included a gradient programmer, non-stainless steel pumps, programmable fraction collector, UV monitor and pre-packed separation columns to fulfill all your needs for biological separations. Now, in just one or two steps, electrophoretically pure enzymes can be purified from crude tissue extract in just 10 to 40 minutes, with an overall yield in enzyme activity of greater than 80%.

In fact, we're so confident that we invite you to try out any biological sample, in aqueous or organic solution, so that you can see for yourself just how magical our new FPLC System would be for you.

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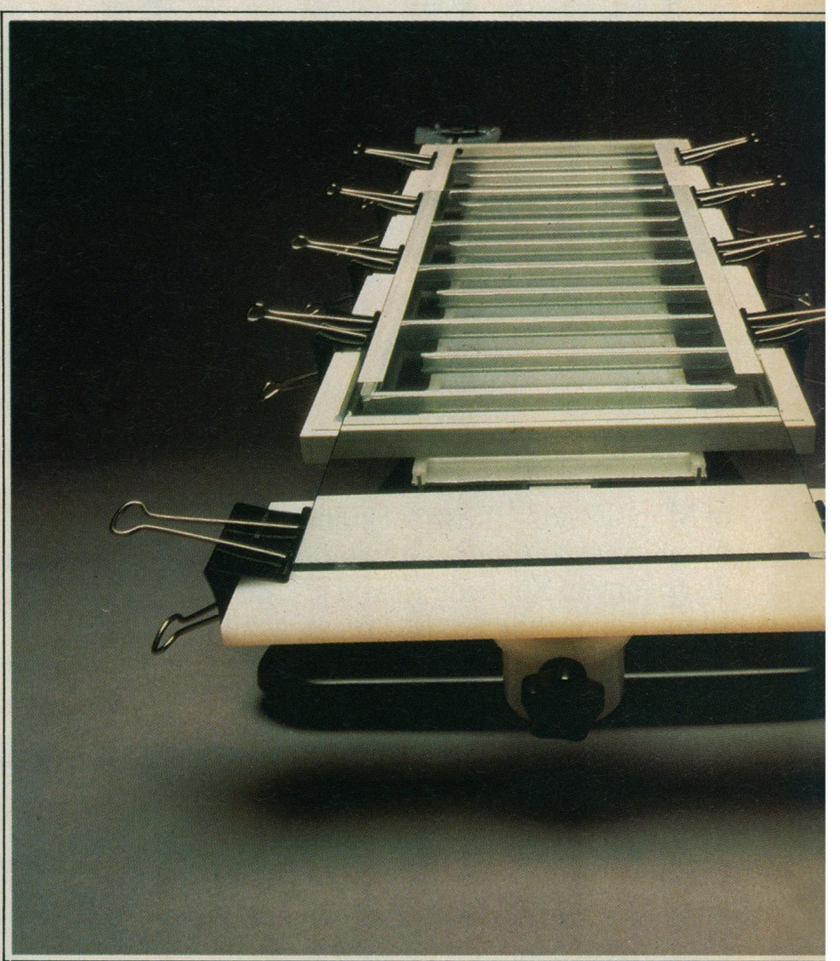
LKB offers you a choice of two

This one is optimized fo

The LKB DNA/RNA Sequencing System successfully combines all the relevant technology and know-how into a single integrated system dedicated to and optimized for nucleotide electrophoresis. Basically, the amount of sequencing information that can be obtained from one experiment is limited primarily by the resolution of the electrophoresis system used. This resolving power is in turn limited mainly by the length and thickness of the gel, by thermal and mechanical distortion, and by the so-called 'smile effect'.

The LKB Sequencing System, built up around our Macrophor Electrophoresis Unit, reduces all these limitations to the absolute minimum. It provides longer reading frames, halves the required sample volume, reduces run times and greatly simplifies the task of gel casting.



Long ultrathin gels

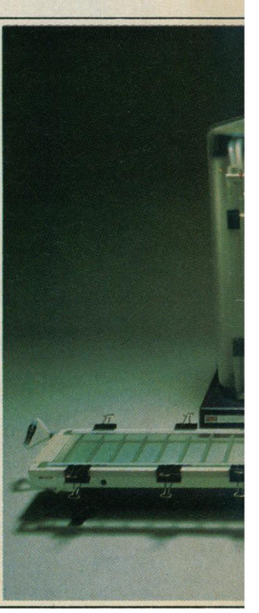
By long we mean up to 530 mm; by ultrathin we mean down to 0.1 mm. Greater length obviously gives a much longer reading frame, while reductions in thickness bring you many benefits. You use far less chemical to cast each gel and need far less sample - as little as 2 μl - to perform each run, which is an important factor in many applications. Macrophor is rated for safe 5 KV operation using ultrathin gels, and this gives both improved resolution and shorter run times. A more even heat transfer reduces thermal distortion, while minimized radiation scattering during autoradiographic detection results in significantly sharper bands.

▲ *Macrodrive 5 is LKB's safe and easy-to-use 5 KV power supply, delivering constant voltage from 0-5000 V, constant current from 0-150 mA, or constant power from 0-200 W*

THE LKB SYSTEMS APPROACH

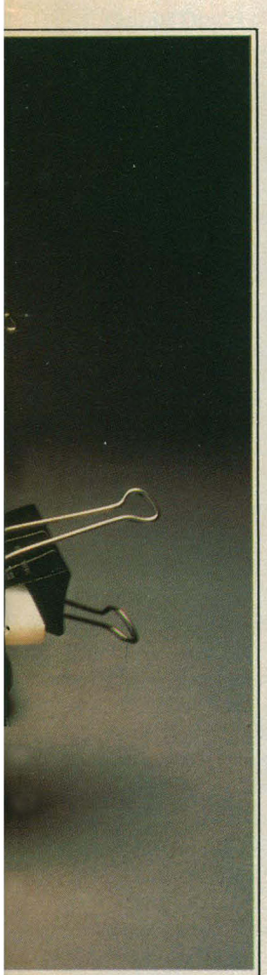
At LKB we believe that we should be able to give you professional training, advice and support in the use and application of our products. And we should certainly be able to supply you with everything you need to perform your experiments, so you never have to worry about where each item comes from, how good it is, whether it will work properly with all the other pieces of apparatus, and who to turn to when you have problems. That is why we offer complete integrated systems, not merely a range of individual units. LKB systems contain all the instruments, kits, chemicals, accessories and supplies you will need in your laboratory. Every component of the system is designed to work together with and enhance the high performance of all the other components. Every item carries our name, and we take full responsibility for it.

LKB - the electrophoresis experts



Vertical Electrophoresis Systems

r DNA/RNA sequencing



Gel casting the easy way
The advantages of ultrathin gels are only of interest if you're sure you can cast your gels easily, quickly and reliably. That's why the LKB DNA/RNA Sequencing System includes our Macromould Gel Casting Unit which uses a patented sliding-plate technique: the fastest and simplest method available for casting reproducible, bubble-free gels. With just a little practice, you will be able to produce perfect gels in under 60 seconds. The System includes interchangeable spacers and plates for casting gels 0.4, 0.2 or 0.1 mm thick and 190, 410 and 530 mm long. You can also use other length plates which you make yourself.

Bitter experience may tell you that unless well supported, ultrathin gels tear very easily during removal, drying and storing. Sample slots may become deformed during a run, resulting in curved bands. To overcome these problems, the gels are covalently bonded to a glass plate for ease of handling. This is done in practice by casting the gel between a thermostatic plate coated with LKB Repel-Silane and a plate of float glass coated with LKB Bind-Silane.

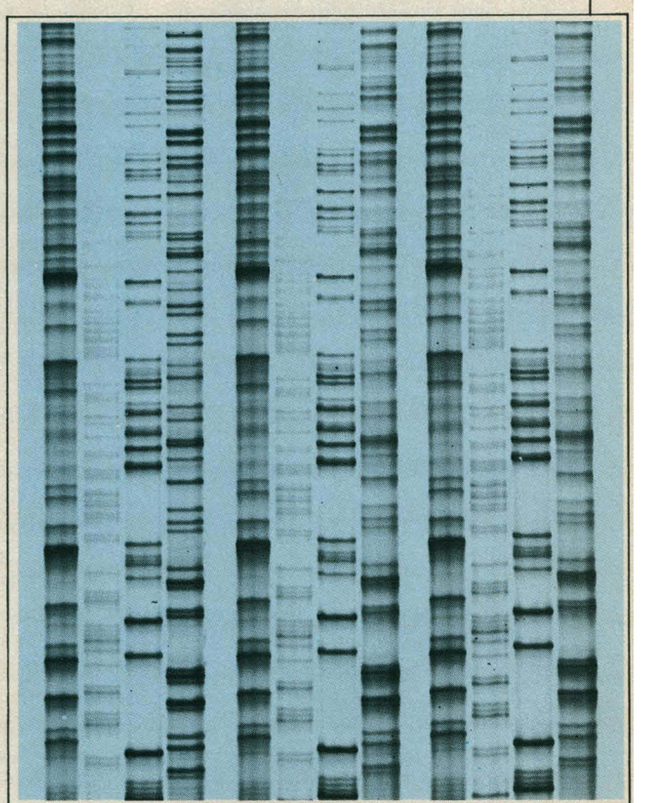
Even a 0.2 mm thick, 20% polyacrylamide gel, when bound in this way, can be dried down onto the glass plate without damage. The resulting film - now only 20 μm thick - can then be placed in direct contact with the X-ray film, giving much sharper and better resolved bands than those obtained from a gel which has not been dried.

◀ *The LKB Macromould Gel Casting Unit makes it easy for you to cast reproducible and bubble-free ultrathin gels of different sizes and thicknesses in less than one minute*

Seriously, no smiling
It is desirable to carry out electrophoresis runs at a high gel temperature in order to resolve clearly those nucleotides that are still compressed in conventional systems. In the LKB Macrophor, the thermostatic plate onto which the gel is cast is used to maintain the gel temperature. Warm water is circulated through the unit by the LKB MultiTemp II, thus ensuring that the temperature is constant everywhere in the gel and that all samples are run under identical conditions. The 'smile effect' is thereby eliminated, making the bands straight and much easier to read. You can use the full width of the gel and obtain equally good results from all your samples.

◀ *The DNA/RNA Sequencing System, based on the LKB Macrophor Electrophoresis Unit, also includes a 5 KV power supply, thermostatic circulator and all the necessary accessories*

Not convinced?
Well, we don't expect you to just take our word for all this. Call your local LKB representative right now and we'll arrange to show you the full capability of the LKB DNA/RNA Sequencing System.



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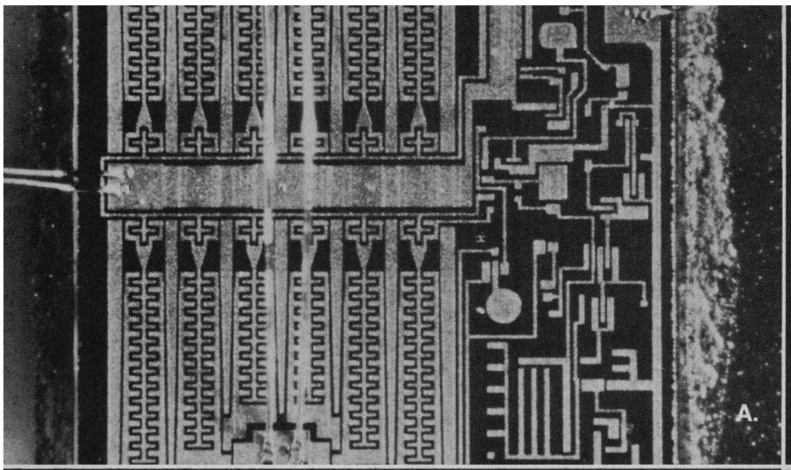

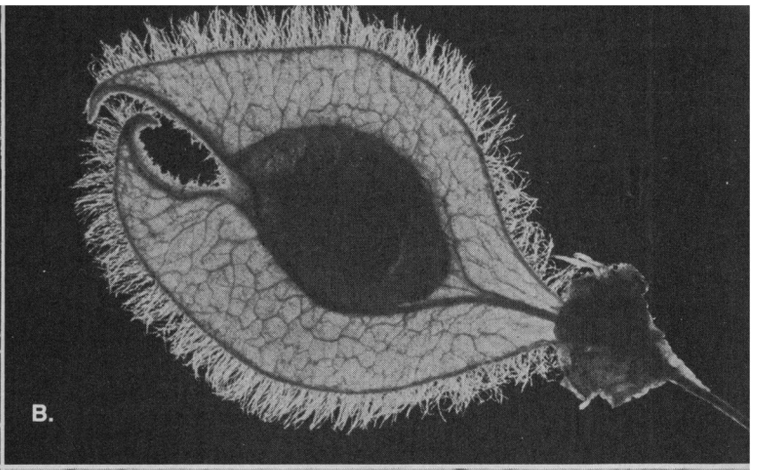

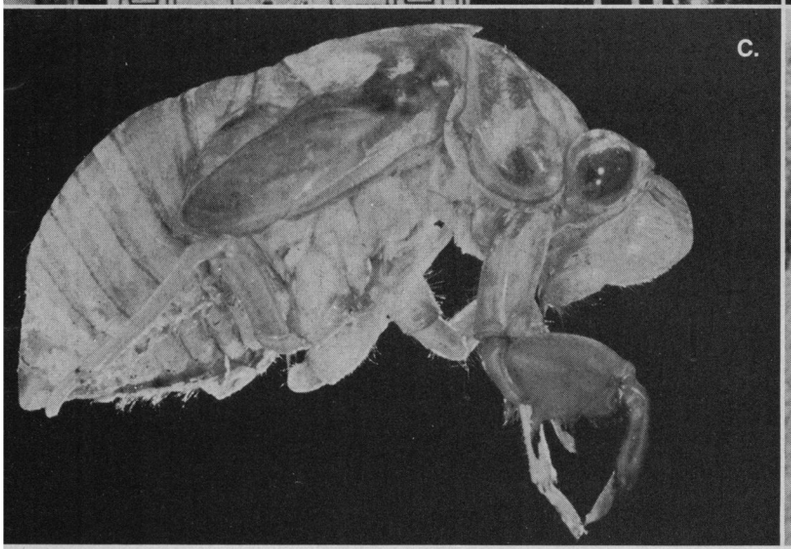

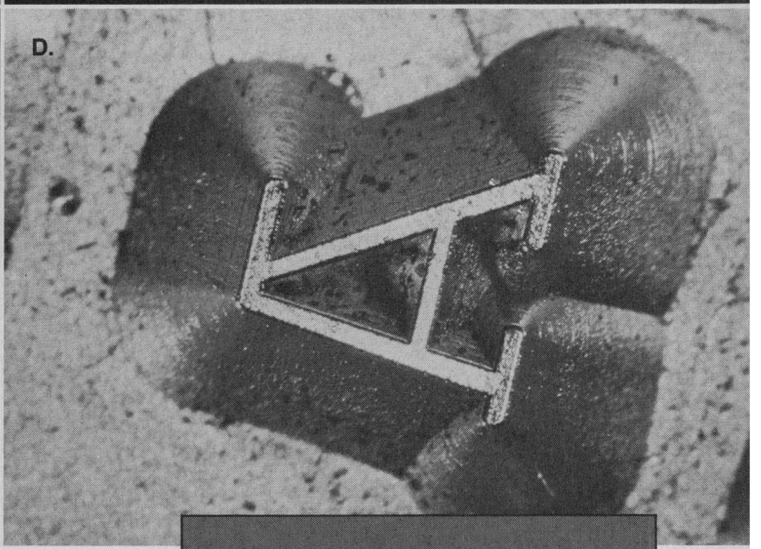

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Macroscopy is high-resolution, low-power microscopy — a technique perfected by Wild Heerbrugg in Switzerland. The image quality is that of a first rate compound microscope. At the same time, Wild Macroscopes incorporate the most desirable features of stereomicroscopes, such as a wide binocular view, long working distances and a wide zoom range. They produce erect, non-reversed and flat images, making it easy to manipulate and photograph the specimen at all levels of magnification, from 3.9x at the low end to a maximum of 160x. At comparable magnifications, the macroscope offers two important advantages over conventional stereomicroscopes: (1) a 50% greater resolving power, (2) an axial imaging path for accurate linear measurements and crisp photomacrography, even with polarized light.

Four macroscope models have been developed: M400 for automatic photomacrography; M410 for observation only; M420 for observation and photomacrography, manual or automatic; and M450 with integrated coaxial illuminator for micro-electronics and metallurgical applications.

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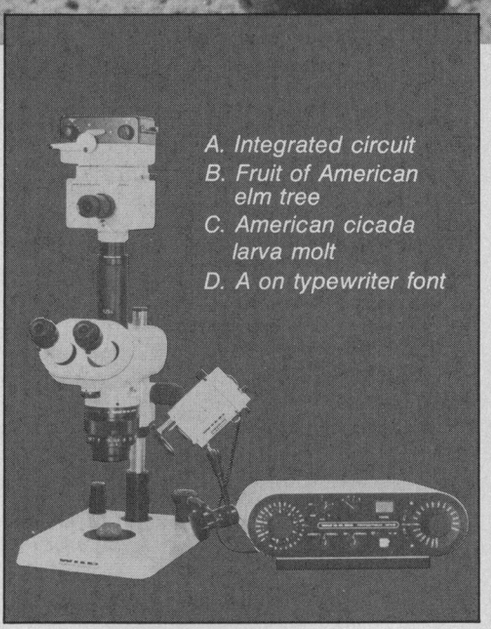
Call or write E. Leitz, Inc., Rockleigh, NJ 07647. (201) 767-1100.



A. Integrated circuit
B. Fruit of American elm tree
C. American cicada larva molt
D. A on typewriter font

Wild M420 photo macroscope

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employment is high, and prospects for return of prosperity are bleak. One plant in the district, producing metallurgical coke in a modified beehive furnace, practices such thorough postcombustion of volatile matter that the plant's neighbors cannot believe it is operating because its stack is so clean. A furnace of this type could produce a smokeless fuel containing roughly three-quarters of the coal's original volatile matter at a rate roughly double the furnace's output of coke. The fuel would ignite more readily than anthracite, and new furnaces of this type could be built and placed in operation within a year. Furnaces of other types could come into production quickly in the subbituminous coal district of Wyoming and Montana.

Our nation's programs of foreign aid have assisted wheat farmers by distributing their product to the world's hungry. Isn't it time for foreign aid to assist our impoverished miners while also helping to preserve the world's forests?

ARTHUR M. SQUIRES
Department of Chemical Engineering, College of Engineering, Virginia Polytechnic Institute and State University, Blacksburg 24061

Evolution: An Expanded View

J. G. Kaplan (Letters, 19 Oct., p. 240) writes that recent evidence concerning the inheritance of environmentally induced traits in plants (Research News, 29 June, p. 1415) does "not constitute evidence for, or even bear on, 'the Lamarckian concept of evolution' " because the traits involved were not obviously adaptive. I think such a dismissal is a bit hasty.

1) Lamarck referred to the use or disuse of parts over long periods under a particular environmental circumstance and recognized imperfect intermediates. Further, he was not at all precise about how he intended his scheme to apply to plants, although he clearly did intend so. But even today we do not suppose that an evolutionary mechanism must produce an adaptive character as an immediate consequence; drift and meiotic drive come to mind.

2) If indeed nature produces heritable acquired traits that are adaptive, we are not likely to know it until we establish whether acquired traits can be inherited at all. The apparent affirmative evidence from plant breeders, along with a plausible mechanism (genomic rearrangement), seems to me to be as exciting a discovery as that of particulate inheritance. To suggest that it does not bear on Lamarckian evolution because it is not prima facie proof misses the point.

3) There is no question here of Lamarck versus Darwin. The current ferment in evolutionary theory appears to be heading toward an expanded view of evolution in which many processes and individual circumstances play a part. Finding a legitimate case of adaptive Lamarckian inheritance would not likely sweep the last century of Darwinism aside. Rather (I suspect) such a finding would take its place as yet more evidence for the influence of developmental processes on evolutionary modification. At any rate, one should not impugn the evidence at hand as heresy, nor use Lamarck as bogeyman or straw man.

MARTIN BURD
Department of Botany, University of Wisconsin, Madison 53706

The Garrison Project and Drainage Divides

The article, "Day of reckoning for the Garrison Project" by Constance Holden (News and Comment, 31 Aug., p. 904) perpetuates a misconception. In North Dakota, the Missouri River drainage basin is not separated from the Hudson Bay drainage basin by a narrow drainage divide, as shown in the map accompanying the article. Rather, the two are separated by a belt of interior drainage in which surface drainage flows neither to the Hudson Bay nor to the Gulf of Mexico (*1*, p. B107). This belt is only about 30 kilometers wide in the northwest, but widens to about 80 kilometers in the southeast.

It also has a northeastern extension that is even wider, about 150 kilometers. Thus, much of the precipitation falling on the state that runs off the surface remains in the state until it is evaporated, transpired, or otherwise disposed of.

I. G. GROSSMAN
U.S. Geological Survey, 418 Federal Building, 402 East State Street, Trenton, New Jersey 08608

References

1. I. G. Grossman, *U.S. Geol. Survey Prof. Paper 600-B* (1968), p. B104.

Erratum: In the article "Nuclear magnetic resonance technology for medical studies" by Thomas F. Budinger and Paul C. Lauterbur (19 Oct., p. 288), equation 2 on page 290 was printed incorrectly. It should have read:

$$\mathbf{S}(t) = \eta \int d\mathbf{r}\rho(\mathbf{r}) e^{-t/T_2} e^{-2\pi i \mathbf{r}\gamma \int^{t'} \mathbf{G}(t')dt'}$$

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SCIENCE/SCOPE

The first attempt to sample the atmosphere of an outer planet, NASA's Project Galileo will journey 750 million miles to Jupiter this decade. The mission will consist of two spacecraft, an orbiter and a Hughes Aircraft Company-built probe. Six instruments inside the probe's descent module will assess the structure and composition of the atmosphere, determine the location and structure of clouds, calibrate a precise ratio of hydrogen and helium, and measure lightning, radio emission, and energy absorption. The probe will transmit data to the orbiter for relay to Earth. Project Galileo will be the first interplanetary vehicle launched from the space shuttle. The launch is set for May 1986 and arrival for August 1988. Four Hughes-built probes explored the atmosphere of Venus in 1978.

The sights, sounds, motion, and urgency of combat await pilots who learn to fly the F/A-18 Hornet strike fighter in the first computerized simulators of their kind. A pilot wears full flying gear and sits in an exact replica of an F/A-18 cockpit located inside of a 40-foot-diameter sphere. High-resolution pictures of earth, sky, and targets are projected onto the inner surface of the sphere and matched with sounds and vibration. Pilots experience runway vibration, aircraft stalls, buffeting, missile launches, cannon fire, dazzling aerial maneuvers, and aircraft and missiles approaching at supersonic speeds. The Hughes simulator will save the U.S. Navy and Marine Corps millions of dollars by providing combat training without costly flight operations.

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A trio of multipurpose communications satellites has been introduced by Hughes to handle standard communications and direct TV broadcasting to homes. All three are drum-shaped and spin-stabilized. One model, designated HS 393, is the domestic communications satellite of the future. It can carry 16 high-power channels or 48 channels at lower powers. A second spacecraft, the HS 394, has a flat, sun-tracking solar array, thereby combining the best features from the existing technologies of spin-stabilized satellites and body-stabilized satellites. The third model, the HS 399, is a small spacecraft with 12 channels. Occupying only one-fourteenth of a space shuttle cargo bay, it could be launched for about one-third the cost of orbiting a standard 24-channel satellite.

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Dolph Adams, Duke University

IMMUNOREGULATION
Fritz Melchers, Basel Institute for Immunology

IDIOTYPES
Hilary Koprowski, The Wistar Institute

GENETIC ENGINEERING OF MONOCLONAL MOLECULES
Donald Capra, University of Texas Southwestern Medical School

DIAGNOSTIC APPROACHES
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WORKSHOP VI - TO BE ANNOUNCED

Poster sessions: TECHNOLOGICAL ADVANCES IN HYBRIDOMA RESEARCH
Participants are invited to submit abstracts for the poster sessions. These abstracts will be reviewed up until the time of the meeting; however, only those accepted by Dec. 15 will be published in the journal, Hybridoma. Contact Dr. Zenon Steplewski (215) 898-3924.

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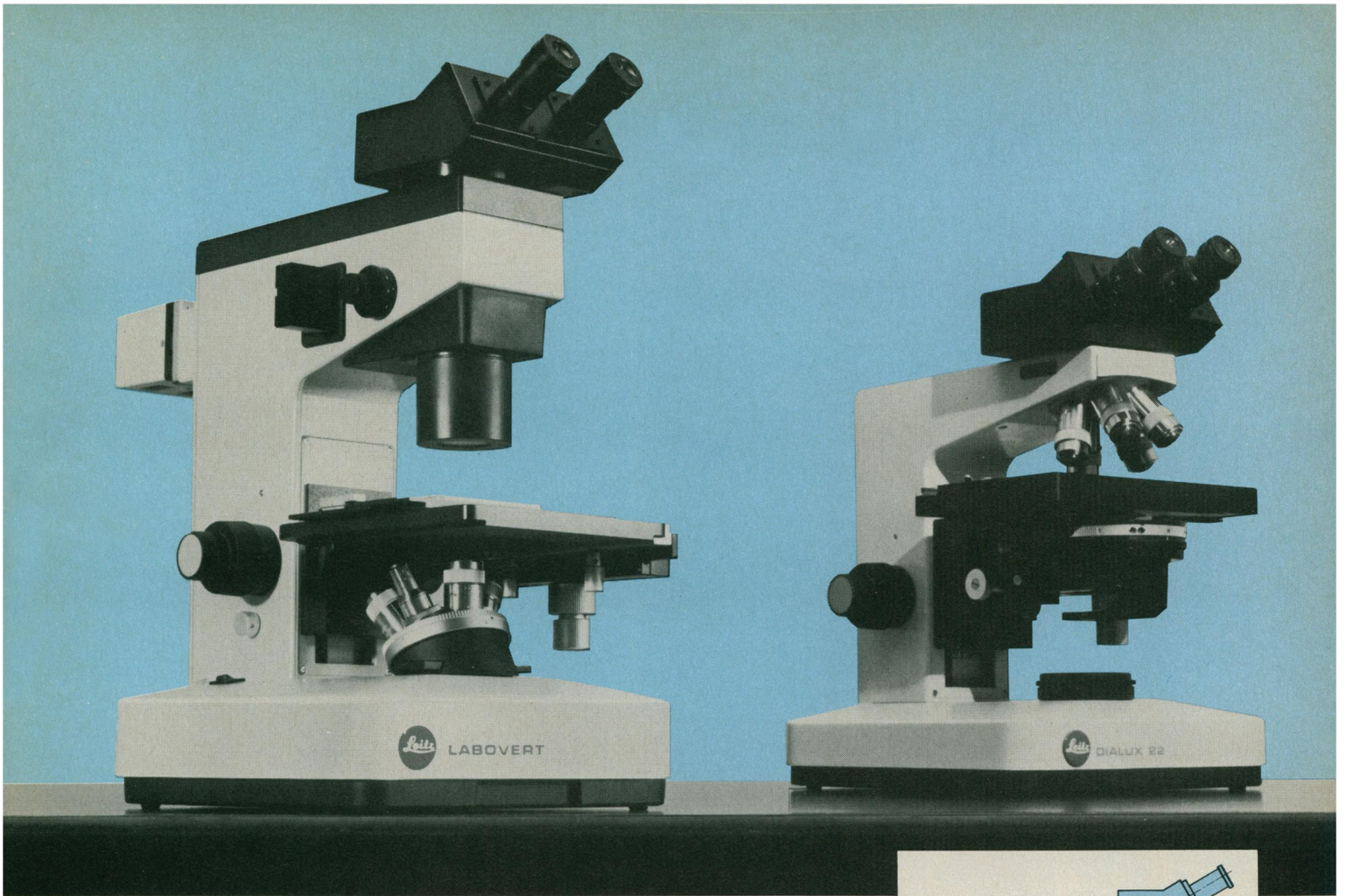
The chairman of the Committee of Adjudicators: G. Zbinden.



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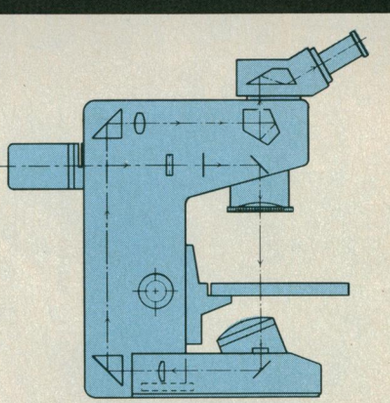

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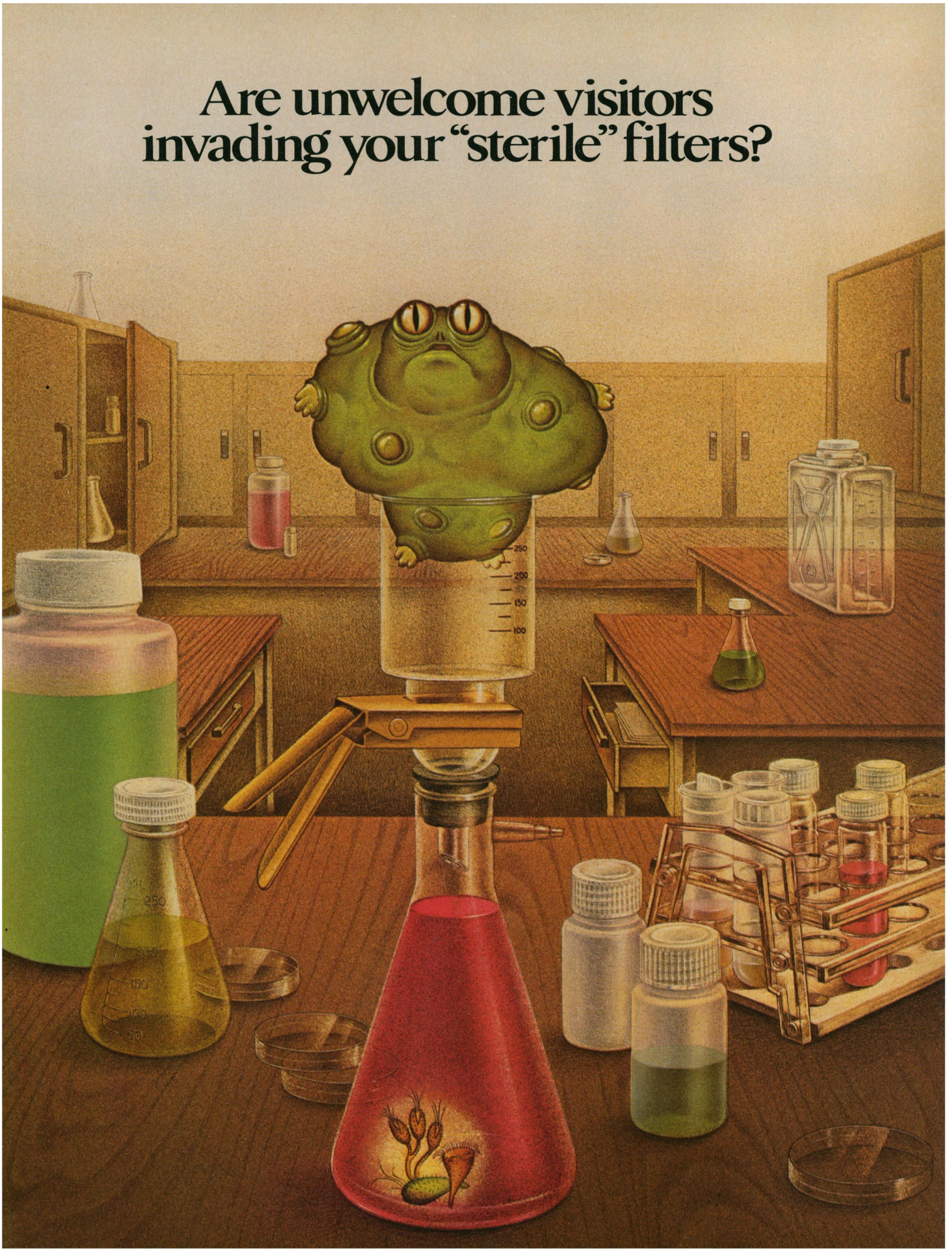

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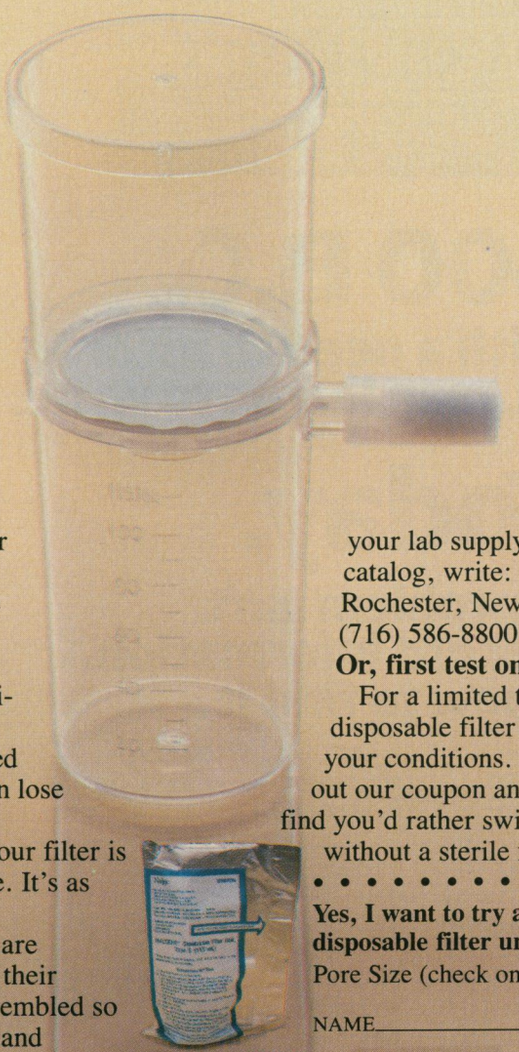

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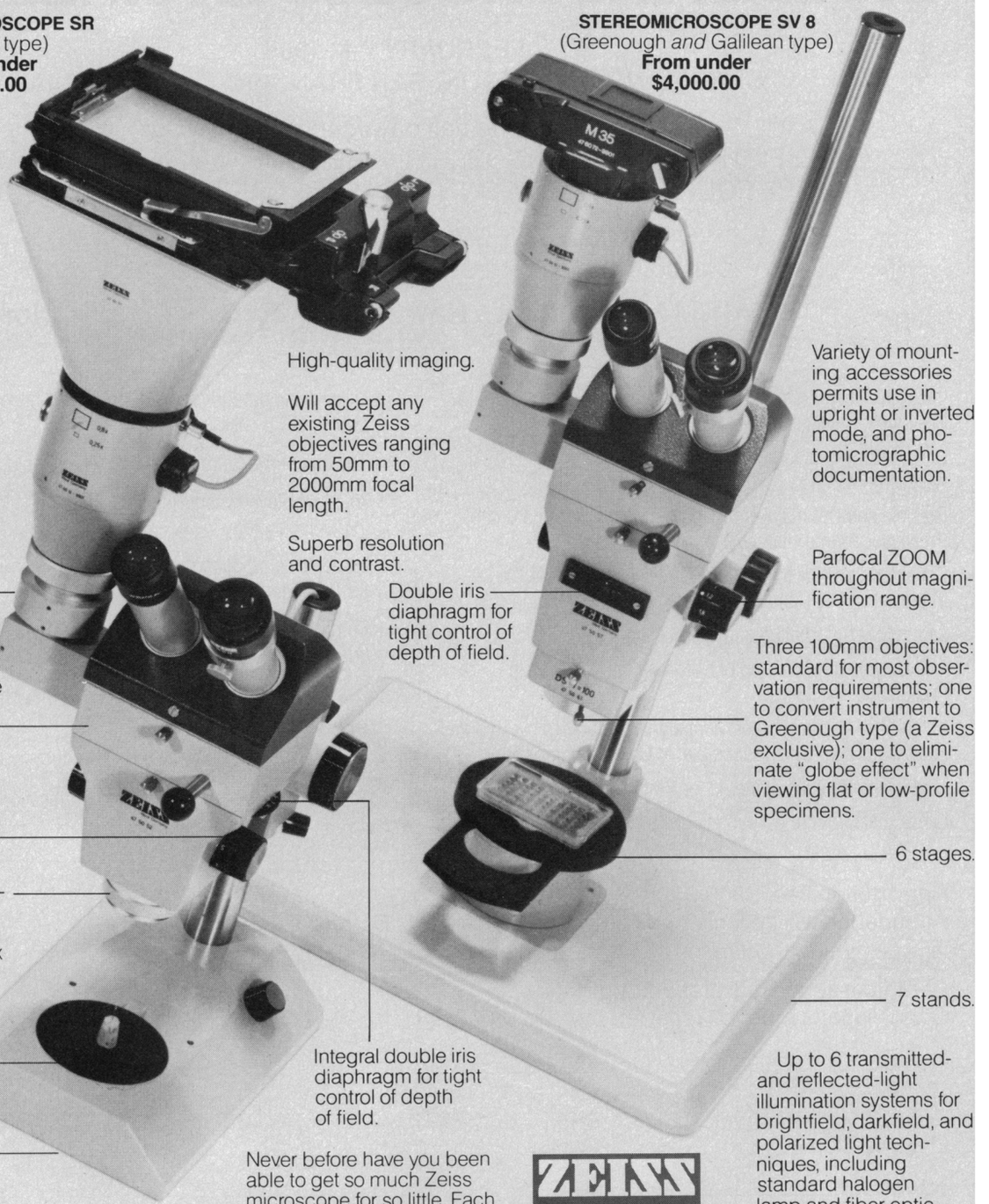

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14 December 1984, Volume 226, Number 4680 **SCIENCE**

Effects of SO_2 and NO_x Emissions

Concern about acid rain continues to mount, ensuring efforts to enact legislation designed to curtail it when Congress meets again. Earlier, impetus for abatement centered around acidification of some lakes and around Canadian protests about transboundary flow of some of our emissions. Lately, attention has been drawn to possible effects of pollutants on forests. Pathology has been noted recently in trees at higher elevations along the mountains from the Northeast to Georgia.

The extent of the problem in the United States is minimal in comparison to that in West Germany. In just a few years observed occurrences of pathology in the forests there have increased from a few percent to more than 50 percent. The news from West Germany is alarming, and its impact is fueling a demand for action here.

One proposal is that SO_2 emissions should be cut in half. The Electric Power Research Institute has estimated that the cost of such a program would be $10 billion a year for many years. In this country, the contribution of SO_2 to the formation of hydrogen ions is about two times that of the nitrogen oxides. If the target of an effort is solely to diminish the acidity of rain, reduction of SO_2 emissions is a logical objective. However, if the goal is to avoid possible pathological effects on forests, the focus of abatement efforts probably should be NO_x. The nitrogen oxides do much more than give rise to nitric acid. They are involved in photochemical reactions that lead to oxidants such as ozone that are highly toxic to plants and trees. Some of these effects have been noted for many years in the vegetation of southern California. In that area, there are negligible amounts of sulfur oxides but substantial quantities of NO_x and photochemical oxidants. Damage from ozone to trees such as ponderosa pine has been extensive and can be seen in trees as far as 120 kilometers east of the urban centers. Studies have shown that chronic exposure to 6 parts per hundred million (pphm) of ozone results in visible damage to some conifers.

Pollution control in West Germany has lagged behind that in the United States. The Germans have no speed limit on their autobahns, and the vehicles do not have catalytic devices to minimize NO_x emissions. Vehicles are by far the greatest source of NO_x, and the total tonnage of NO_2 emitted by all sources is greater than that of SO_2. Measurement of ozone concentration in the Black Forest has yielded a value of about 9 pphm and a peak value as high as 27 pphm. Explanations advanced by German scientists for the pathology noted in their forests include effects of acid on foliage and roots, heavy metals, aluminum toxicity, insects, and diseases. The truth probably lies in a combination of all these, together with photochemical oxidants.

There are many gaps in our knowledge about pollutants. A major one is the relative effects of wet and dry deposition. The amounts of wet deposition are well known. They account, however, for only 20 to 30 percent of total emissions. What happens to the remainder is a mystery.

Another important unknown is the rate at which lakes are being acidified. Little evidence exists that many lakes are undergoing substantial change now. The Environmental Protection Agency is conducting measurements on 2000 lakes to establish a database. The magnitude (large or small) of the acidification problem should be evident in a few years.

Another unknown is the relation of sources to deposition. Many people believe that burning of coal in the Midwest is the source of acidification of lakes in the East. However, local sources are apparently also important contributors to acidification.

These are only a few examples of the lack of knowledge about the effects of pollutants. A determined effort is now being made in the United States and West Germany to better understand the phenomena and to learn how to cope with them. West Germany apparently needs to take quick action, but in the United States there is time to seek knowledge before committing to enormous expenditures that might prove misdirected.—PHILIP H. ABELSON

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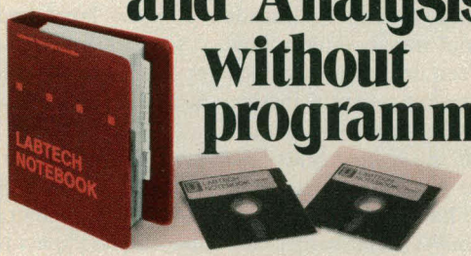

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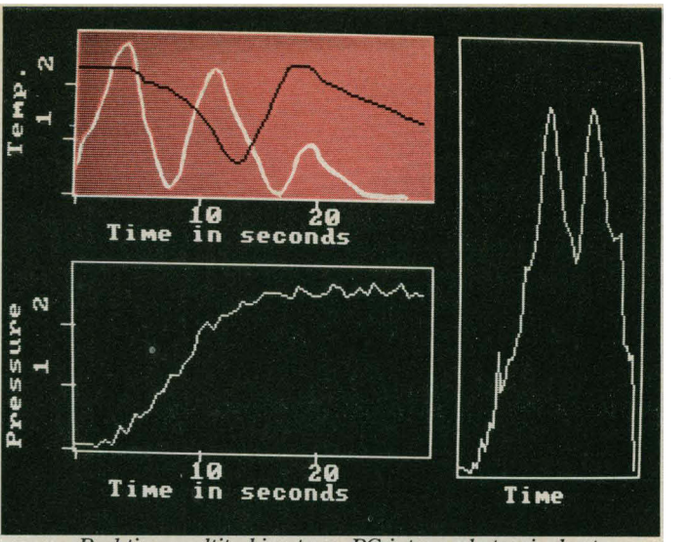

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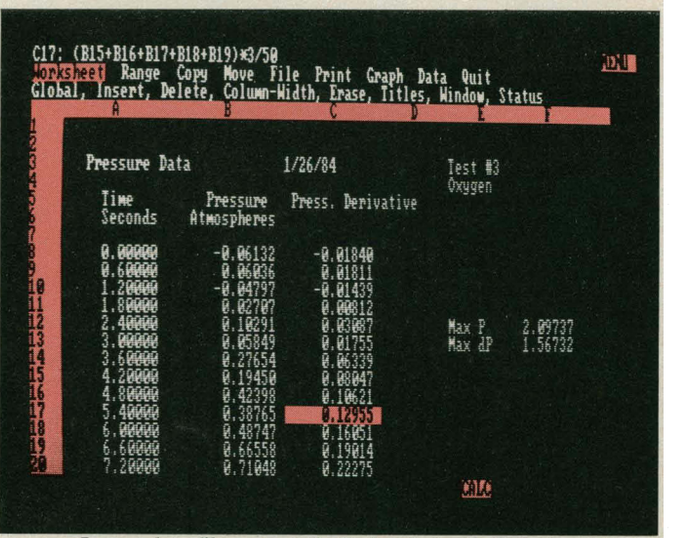

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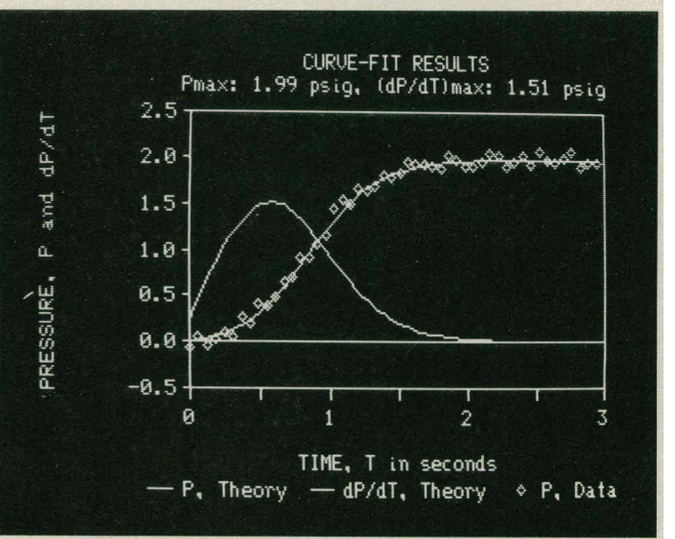

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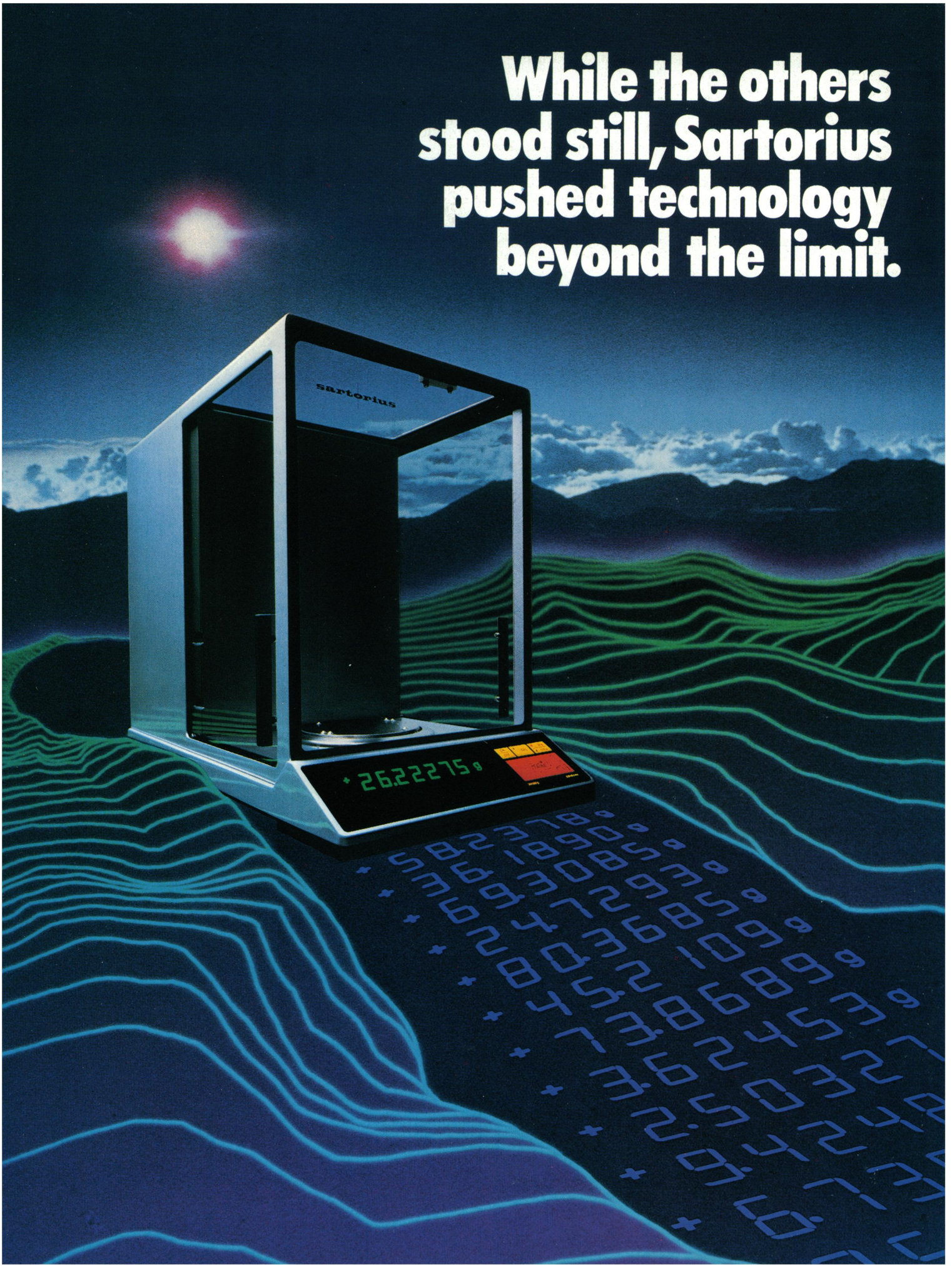
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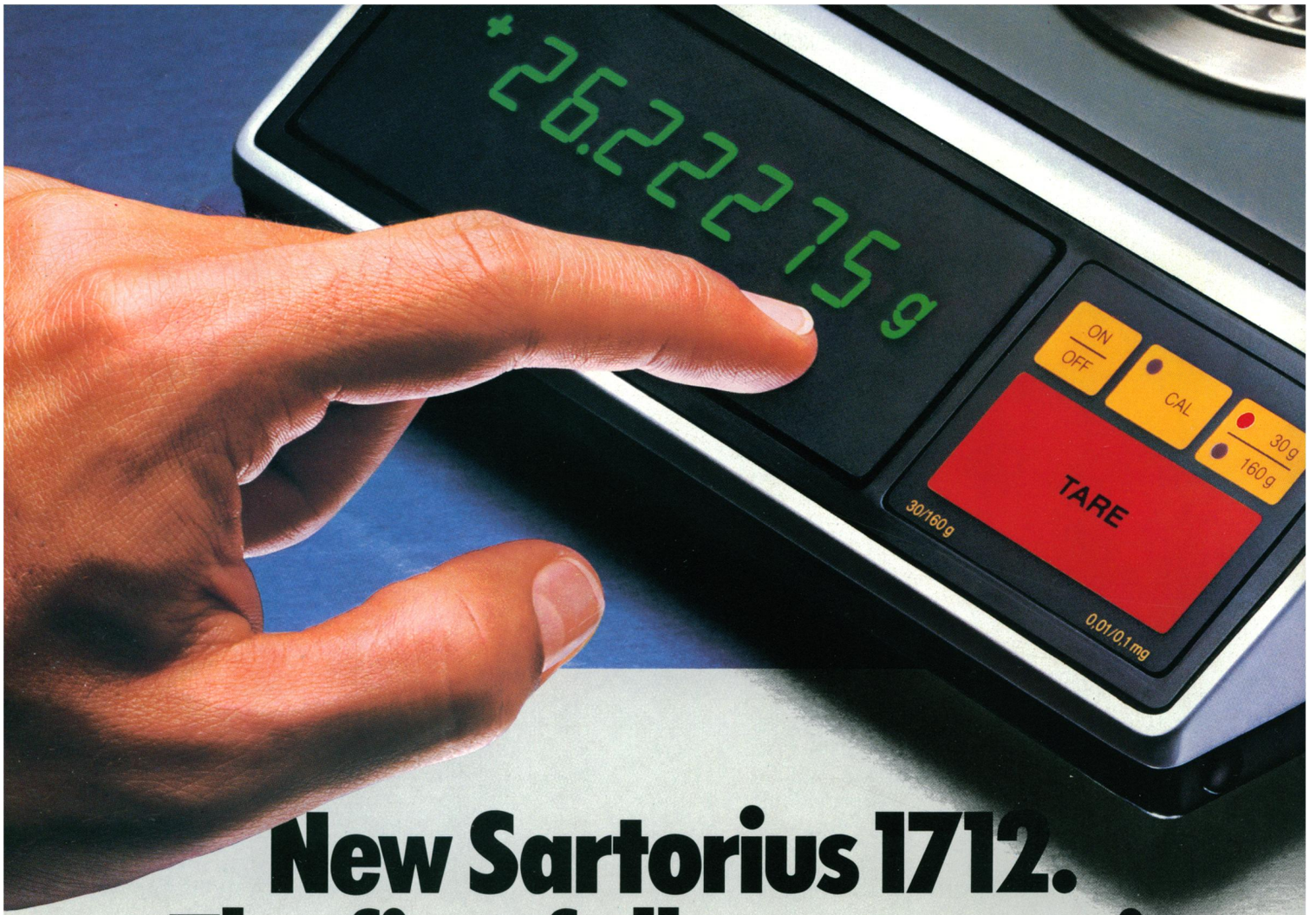

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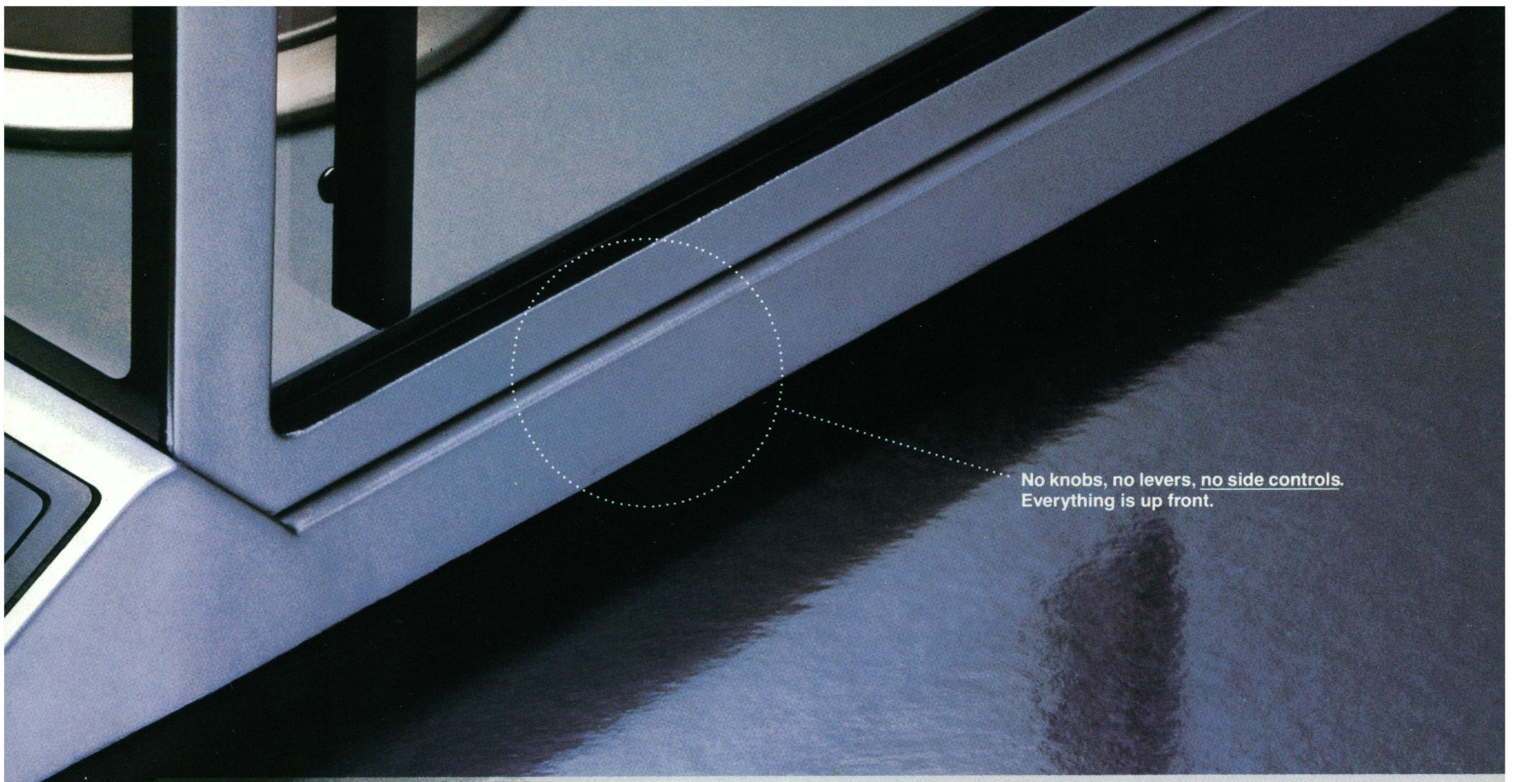

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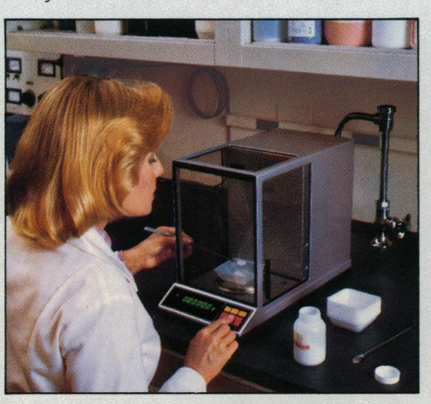

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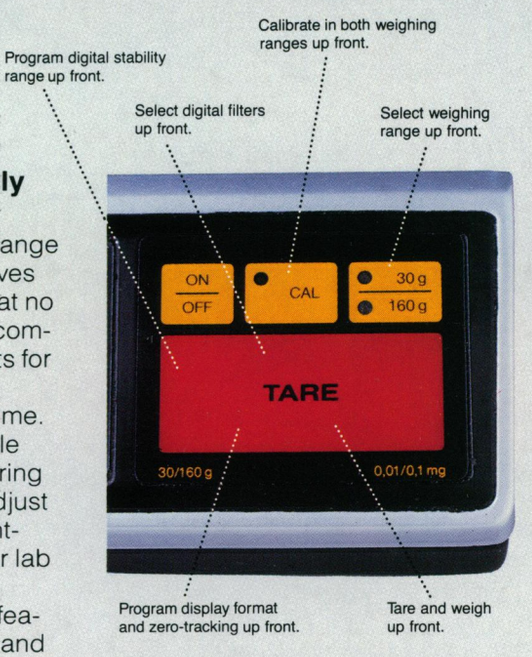

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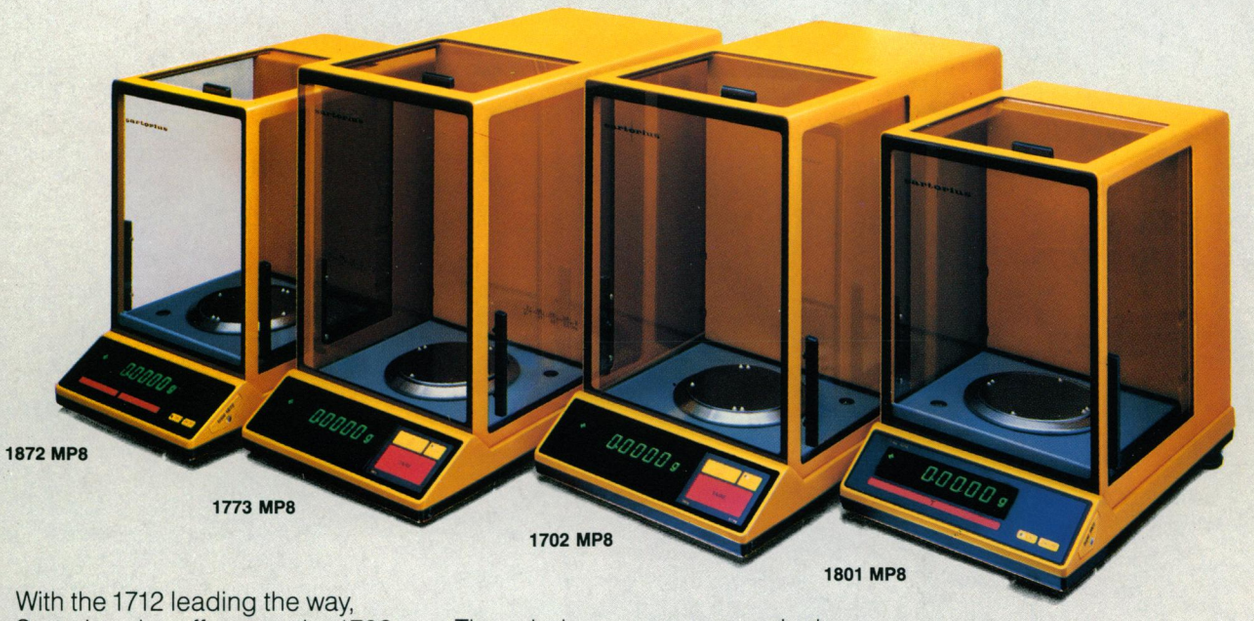

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Readability	0.1 mg	0.01/0.1 mg	0.1/0.2/0.5 mg	0.1 mg	0.1/0.2/0.5 mg
Reproducibility (SD)	≤ +0.1 mg	≤ ±0.02/0.1 mg	≤ ±0.1/0.1/0.25 mg	≤ ±0.1 mg	≤ ±0.1/0.1/0.25 mg
Linearity	≤ ±0.2 mg	≤ ±0.03/0.2 mg	≤ ±0.2/0.2/0.5 mg	≤ ±0.2 mg	≤ ±0.2/0.2/0.5 mg
Taring range (by subtraction)	0-200 g	0-30/160 g	0-300 g	0-110 g	0-160 g
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Housing (w x d x h)	211x408x313 mm	211x408x313 mm	211x408x313 mm	186x315x270 mm	186x315x270 mm
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Call for Contributed Papers

Poster Sessions Only—Deadline 18 January 1985

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Although it is too late to submit suggestions for symposia for this Annual Meeting, contributed papers can be sent in up to 18 January 1985. Instructions for abstracts are given below and a sample is shown.

The contributed paper sessions are of the **POSTER type only.** In such sessions, each contributor will have a bulletin board on which to place text and graphic material (of an oversized nature) for an extended period of time so that the work can be discussed with all interested parties.

Please note that the privilege of contributing a paper is extended only to AAAS members, although the member need not be one of the authors but merely the endorser of the contribution. The presenter, who need not be a member, is expected to register at the Meeting.

Instructions for Contributors

Type abstracts, using a clean (new) ribbon, on ordinary white bond paper (8.5 by 11 inches; 21.5 by 28 cm) according to the format shown on the right (the example is reduced to about one-half of the linear dimension; your abstract will be printed *directly from your copy* at about two-thirds of its linear dimensions). Indicate at the top of the page the letter of the AAAS Section which comes closest to your subject matter (a full list will be found at the bottom of the contents page of any issue of *Science*) as well as two or three words which give the subspecialty involved.

It is very important to keep your abstract within the limits of a 5-inch (12.7-cm) square. If it is too wide, it will be returned; if it is too long, it may be arbitrarily cut. **Note that your original will be our camera-ready copy, so type and letter as neatly as possible.**

At the bottom of the page, left side, type the name and address of the person who should be contacted regarding the abstract (that is, the person we should notify of where and when the presentation should be made). On the right side, type the name and affiliation of the AAAS member or fellow who is submitting the abstract and have this person sign the abstract. *The privilege of submitting a contributed-paper abstract for the Annual Meeting is limited to AAAS members or fellows, but this person need not be one of the authors.*

Send the *original* together with 3 copies of your abstract to:

Contributed Papers
AAAS Meetings Office
1101 Vermont Avenue, NW
Washington, D.C. 20005

Not later than 18 January 1985

Abstract submitted for a POSTER SESSION at the AAAS Annual Meeting in Los Angeles, CA (26-31 May 1985)

AAAS Section nearest subject matter _____

Subspeciality of this Section _____

5 *inches (12.7 cm)*

5 *inches (12.7 cm)*

Indent Five Spaces and Type Title in Upper and Lower Case Letters and Underline. AUTHOR'S NAME (Institution in Parentheses), SECOND AUTHOR (Institution).*

Skip a space and type abstract. The full width of the column of typed material should be 5 inches (12.7 cm) and must not extend beyond that. Abstracts which are wider than this will not be printed (only the title and authors will be printed). The total length of the material, from top of title to bottom of footnotes, should not exceed 5 inches (12.7 cm); material which takes up more than this space is subject to arbitrary cutting. All special symbols and signs which must be hand lettered (e.g., π) should be rendered in reproducible black ink as clearly and carefully as possible. The entire submission should be of camera-ready quality so that it can be photographed, turned into a plate, and printed. The printed abstract will be about 2/3 the size of the typed version. Avoid paragraphing as this wastes space. However, you may use your allotted space to neatly letter in equations and diagrams, as you deem necessary,

$$-\frac{\hbar^2}{2m}\nabla^2\psi + V\psi = i\hbar\frac{\partial\psi}{\partial t}$$

as indicated in this example.

*Skip a space and type footnotes. Author's names should be in all upper case letters; institutions in upper and lower case letters.

Person to be contacted about abstract:

Full Name
Complete Address

Submitted by AAAS member:

Type name of member
Type affiliation of member

_____
(signature of member)