

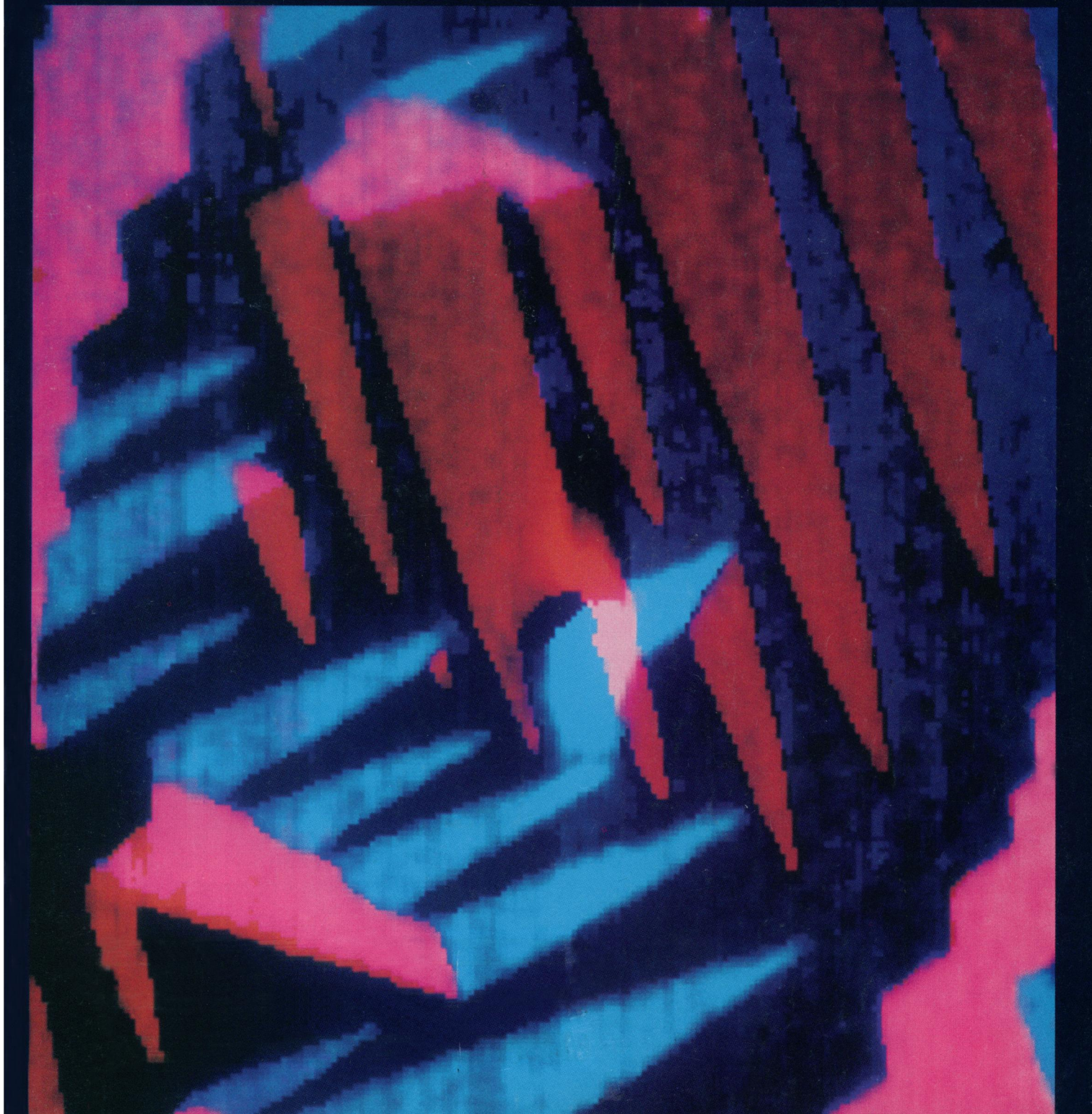
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# SCIENCE

*Instrumentation & Surface Science*

17 OCTOBER 1986  
VOL. 234 ■ PAGES 249-400

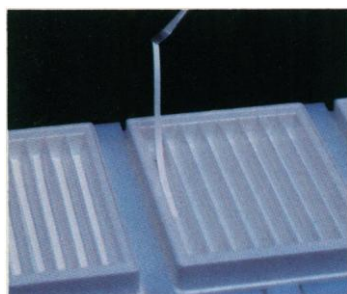
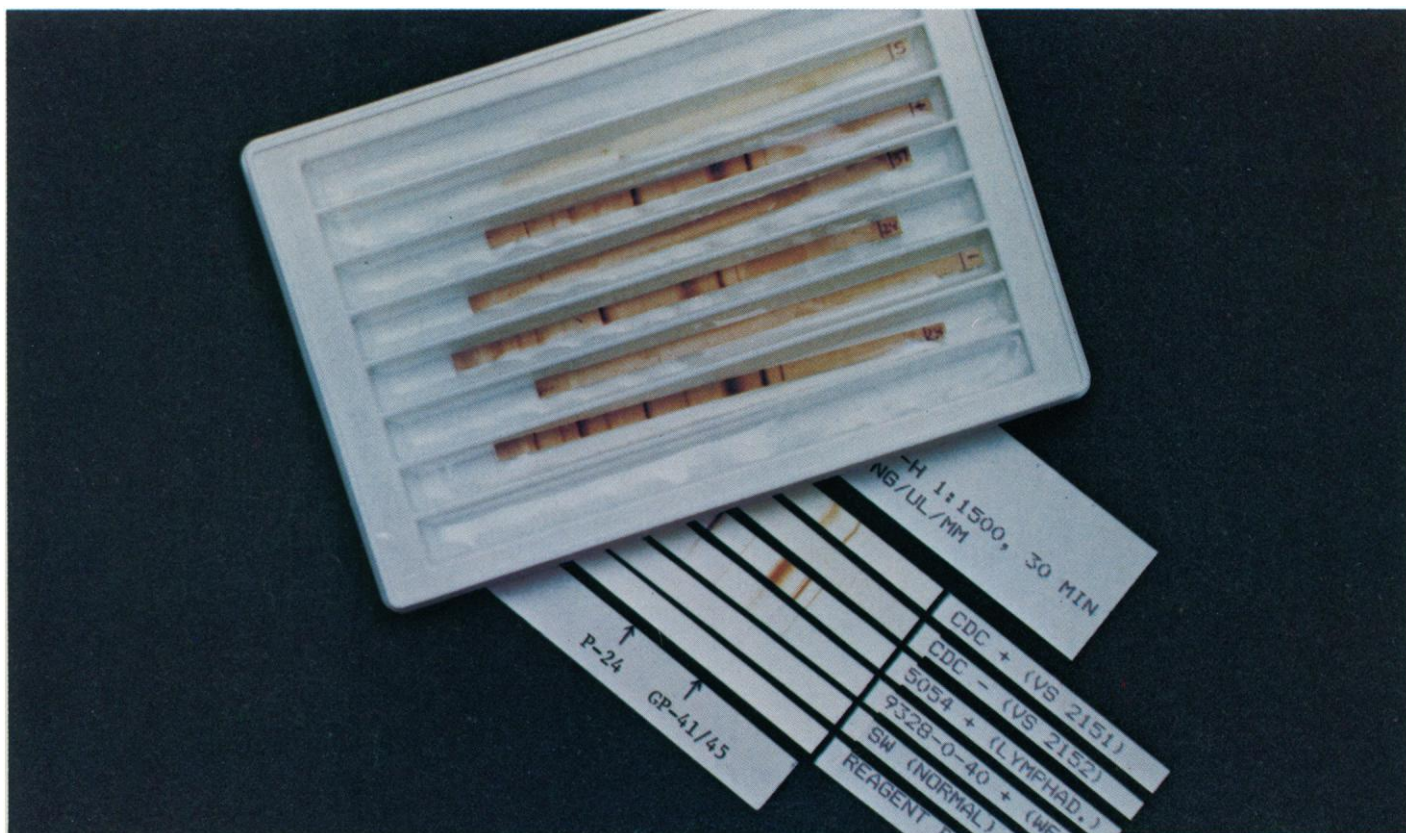
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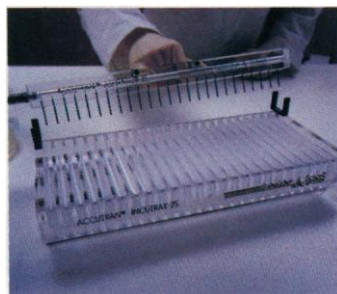


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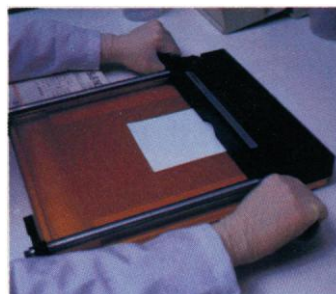
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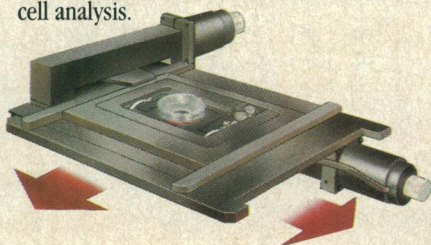
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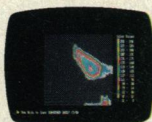
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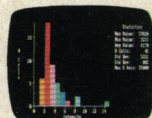
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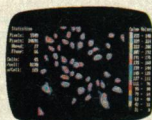
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**COVER** The magnetic domains on the surface of an Fe-3%Si crystal as observed using the technique of scanning electron microscopy with polarization analysis. The four colors indicate four possible domain orientations corresponding to the four in-plane, easy axes of magnetization of the cubic lattice. See page 333. [Photograph by R. Freemire and B. Young, National Bureau of Standards, Gaithersburg, MD 20899]

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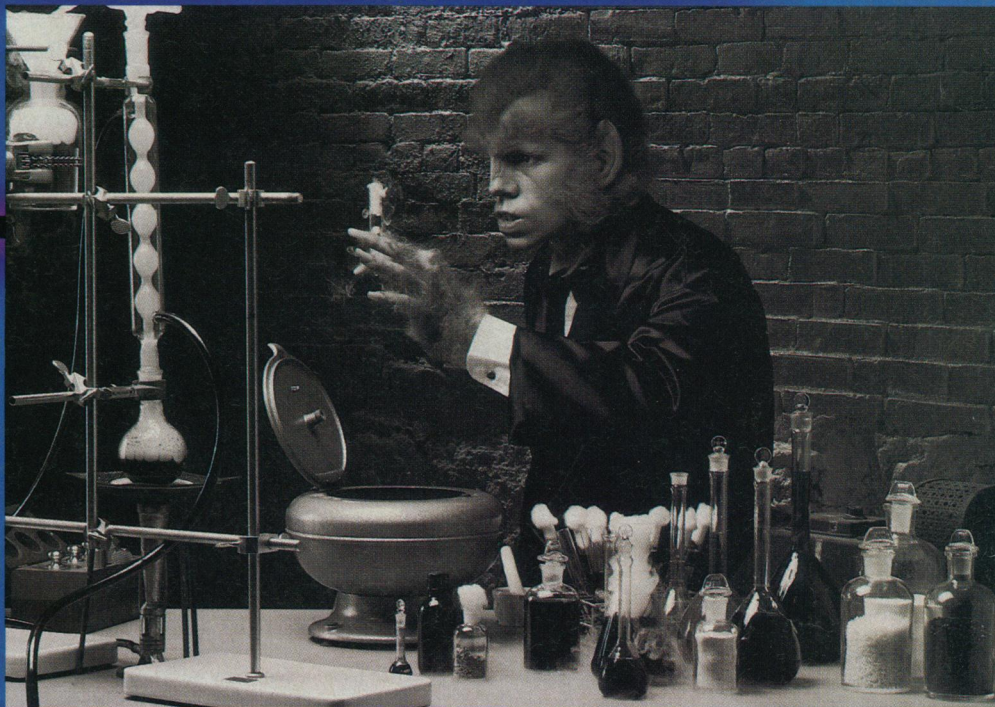
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## This Week in SCIENCE

### Surface corrosion

**I**N the electronics industry, materials are chosen for their electronic, magnetic, and optical properties; they can falter or fail if they corrode (page 340). Like cars and bridges, electronic components can be damaged by humidity, temperature shifts, gases, and contaminating particulate materials. Even sealed surfaces are vulnerable if contaminants are sealed into the hermetic environment. Comizzoli *et al.* discuss how some corrosive processes can, under controlled circumstances, produce positive outcomes, and how scientists and engineers now face the challenge of creating contaminant-free manufacturing environments. Five other articles in this special issue address the diverse attributes of surfaces (cover) and the instruments being used to study them (pages 304–345). Abelson provides an overview of the new methods of observing atoms and electrons on surfaces, discussing how this “new phase of matter,” the surface, is taking on increasing importance in electronics and other industries in which miniaturization has greatly increased the surface to bulk ratio (page 257).

### Predicted structure of interleukin-2

**M**UCH can be learned about the function of a protein from an understanding of its structure (page 349). Cohen *et al.* describe a computer-assisted method for predicting the tertiary structure of interleukin-2 (IL-2) from primary sequence data and derived secondary structures. A combinatorial approach was used, and  $3.9 \times 10^4$  possible structures for IL-2 were generated, but only 27 of these led to plausible tertiary structures that would satisfy the steric constraints, retain the connectivity of the chain, and accommodate a known disulfide bridge in the protein. Features of the molecular model fit nicely with other structure data. The final proof of this (or some other) predicted structure awaits x-ray

crystallographic analysis; meanwhile, the predictions permit testing of the model and construction of analogs for experimental and clinical studies of this important cellular growth factor.

### Interferon signals

**I**NTERFERONS, which have antiviral, antitumor, and immunoregulatory effects, very rapidly produce biochemical changes in cell membranes (page 355). Yap *et al.* report that when  $\alpha$  and  $\beta$  interferons interact with their receptors, there is a rapid (within 15 to 30 seconds) and transient (returning to basal levels by 60 seconds) increase in membrane-associated diacylglycerol and inositol phosphates. Diacylglycerol increases two- or threefold dose-responsively (the phosphates less) depending on the number of interferon receptors present; the rise can be inhibited with antibody to the interferon molecule. Along with this increase, the cells lose their ability to support viral replication. Other substances, such as insulin and thrombin, also use diacylglycerol and inositol phosphates as signaling intermediates, but what makes each signal distinctive, causing particular cellular effects, remains to be determined. The subsequent messengers, yet to be identified, may bind with different kinetics to internal receptors or may activate different internal biochemical pathways.

### Tracing nerves

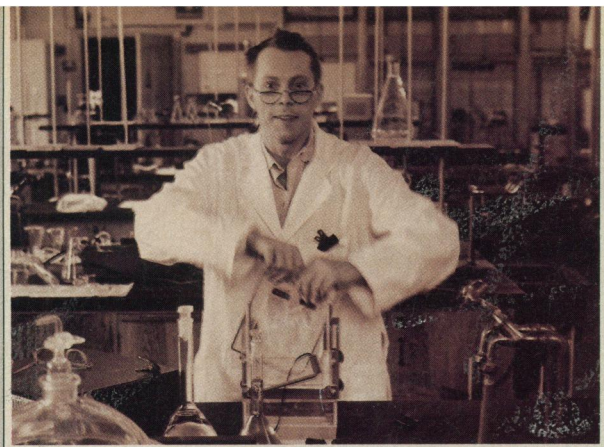
**T**HERE is now a technique for tracing the direction of normal transmission from the cell body of a nerve out through its projections (page 358). Sugiura *et al.* used a plant lectin (*Phaseolus vulgaris* leucoagglutinin) and antibody to it for tracking unmyelinated (C) fibers that originate in the skin and terminate in the central nervous system; these very thin fibers which, unlike myelinated fibers, had not previously been visualized, are the most numerous primary sensory fibers of vertebrates. Responses of individual fibers

to painful and gentle mechanical stimuli and to temperature changes were first determined; then the marker was microinjected into the cell body from which it slowly (at a rate of about 2 to 3 millimeters per day) traveled along the fiber to the central nervous system. Each of four major categories of fibers identified ended in a distinct region in the spinal cord where the processing of sensory information apparently takes place. This technologic advance should contribute to a better understanding of vertebrate sensory neural arrangements associated with pain and other bodily sensations.

### Little Ice Age

**D**ATA recovered in cores of ice from the Quelccaya ice cap (14° south) in the Peruvian Andes support the notion that the Little Ice Age (described in Europe and elsewhere in the Northern Hemisphere) that occurred between the 15th and 20th centuries was a global phenomenon (page 361). Ice cores are rare in the tropics, but in the Northern Hemisphere a number of studies have documented a stretch of colder temperatures and expanded glaciers. The Quelccaya summit (5670 meters) has an annual mean temperature of  $-3^{\circ}\text{C}$  and a yearly accumulation of 300 centimeters of snow; little if any melting, evaporation, or percolation occurs. Visible annual dust layers in conjunction with other measures were used by Thompson *et al.* to date core samples with an accuracy of within 2 years back to 1500 and within 20 years before that. A major volcanic eruption in 1600 produced a thick layer of large ash particles that helped refine the dating. Measurements of conductivity, oxygen isotopes, concentrations and size distributions of particulate materials, and chemicals contributed to the identification of unusually wet and dry periods. Signatures in the ice, showing higher and lower average temperatures, date the Little Ice Age in the Southern Hemisphere from an abrupt beginning in 1490 to an abrupt end around 1880.





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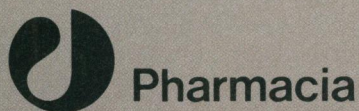
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## Surfaces

The surface region of a solid can be thought of as a new phase of matter; its chemical composition often differs from that of the bulk. Atomic arrangements at or near the surface and electronic structures also differ from those in the solid. New and improved methods of observing inorganic surfaces are leading to findings that are important to fundamental science. The precise behavior of atoms at the surface is crucial in many practical applications, including catalysis, corrosion, adhesion, and lubrication. With further reduction in dimensions of microelectronic devices and increased use of epitaxial layers, surface effects will take on enhanced importance. This issue samples some of the activities of surface scientists.

The scanning tunneling microscope has been modified by Tromp, Hamers, and Demuth to permit simultaneous study of the electronic and geometric structure of Si(111) and Si(001) surfaces. They report observations on the electronic structure of single atoms on silicon surfaces. Silicon atoms are bound covalently in crystals, and it has been known that the discontinuity at the surface leads to a rearrangement (reconstruction) of surface atoms to minimize the number of dangling bonds. The new results correlate atomic position with electronic quantum states. The authors project broad usefulness for their type of equipment in further studies. Examples are crucial defect states in electronic devices and the role of adsorbed foreign elements in catalysis.

Unlike semiconductors, the surfaces of most pure metals are not reconstructed. However, Noonan and Davis note that the distance between the layer at the surface and the second layer is in general reduced—in one example, 8.5 percent. The surface composition of alloy samples is often drastically different from the bulk. For example, in a Pt<sub>78</sub>Ni<sub>22</sub> alloy, the surface layer was enriched to about 99 percent platinum, whereas the second layer was only 30 percent platinum.

Engel has constructed a helium atomic beam apparatus for observing scattering from surfaces. The helium beam has an effective wavelength comparable to atomic spacings in surfaces, and the apparatus has features that give it great flexibility. It can be particularly sensitive to vacancies or kinks on surfaces and to adsorbed molecules. Most of our present understanding of hydrogen adlayers on various metal surfaces has come from atom beam diffraction experiments.

Madey has reviewed studies of electron and photon desorption of adsorbed gases from surfaces. These studies have shown that desorbed ions do not generally come off in an isotropic manner but in directions that are determined by the orientation of the surface molecular bonds. It is known that when CO is bound to Ni(111) the atom bonded to nickel is carbon, and the CO stands upright. Electron-induced desorption leads to escape of O<sup>+</sup> in the direction of the surface normal. Thus measurements of the electron-stimulated desorption ion-angular patterns yield direct information about the geometrical structure of molecules in surface layers. Experiments show that CO stands up on Ru(001), that CO lies down on Cr(110), and that CO is tilted on surfaces such as Pd(210).

Celotta and Pierce are part of a group that has developed instrumentation for polarizing electrons to study magnetic surfaces. Earlier they showed that they could obtain a good source of polarized electrons by shining circularly polarized light on GaAs. Recently, they have developed a small and simple polarization detector that will doubtless find a large number of applications in surface studies. One example of a relation between surface electronic structure and magnetism is the change induced by chemisorption of CO on Ni(110) surface. It was found that the adsorption of one CO molecule eliminated the equivalent of two nickel surface atom magnetic moments.

If microelectronics devices are to be reliable, the behavior of surface materials must be understood and the agents that can cause corrosion and other failure must be identified. Comizzoli and co-workers report on the many kinds of chemical and physical effects that must be minimized.—PHILIP H. ABELSON





# Research

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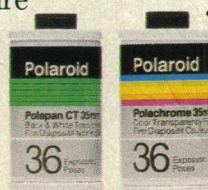
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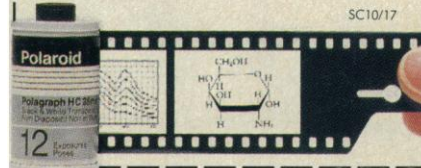
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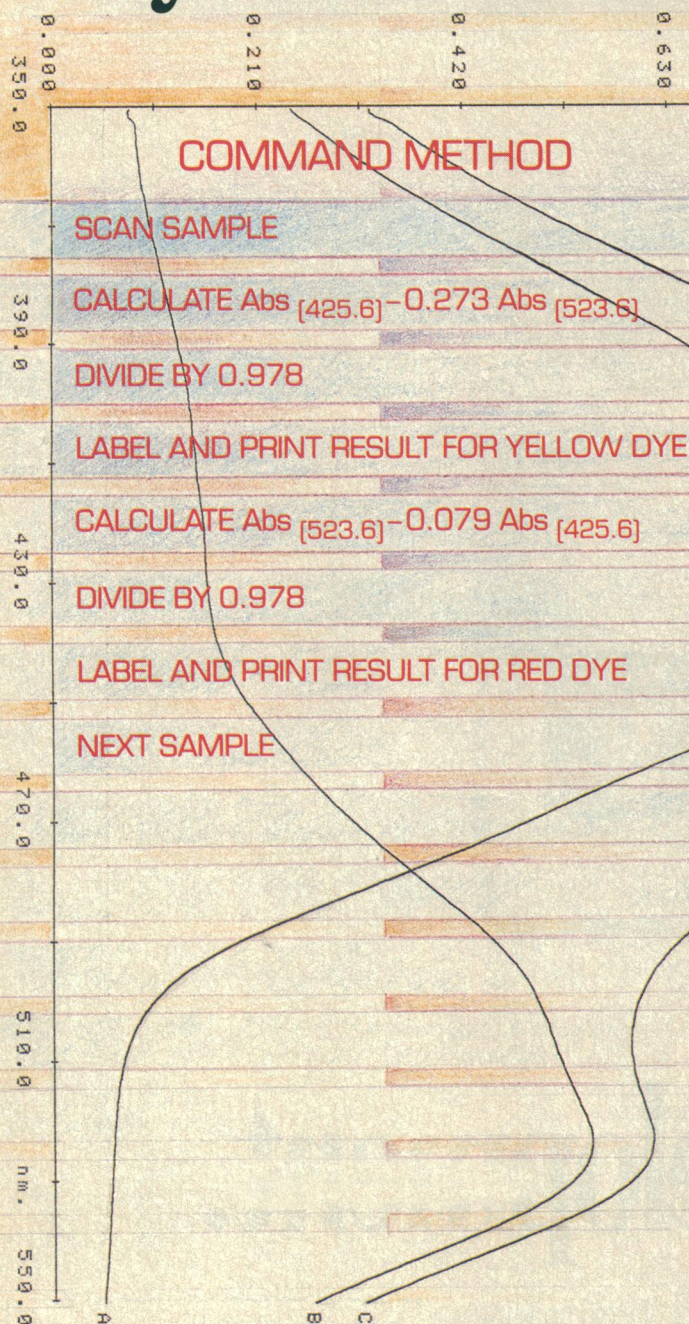
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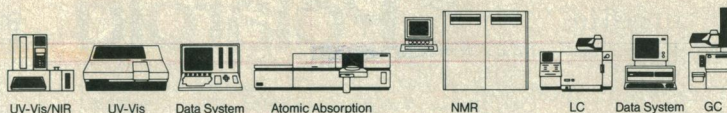
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$\text{Os}^{187}/\text{Os}^{186}$  ratios rule out the crust, but are consistent with the mantle or meteorites (5). Yet  $\text{Pt}/\text{Ir}$ ,  $\text{Au}/\text{Ir}$  (4) and  $\text{Nd}^{143}/\text{Nd}^{144}$  ratios (8) permit only minor amounts of mantle material. Volcanism has been proposed as a source of Ir (9), but there is no evidence whatsoever that it also accounts for the observed chondritic proportions of other siderophile elements (3, 4). Moreover, the Deccan plateau basalts, often invoked as a potential source of Ir (10), contain only 0.005 part per billion of Ir (11)—three to four orders of magnitude less than K-T boundary clays.

3) Shocked quartz (12) and feldspar (2) as well as traces of the high-pressure mineral stishovite (12) have been found at several K-T boundary sites, along with spherules resembling microtektites (13). No process other than hypervelocity impact is known to produce these features (14).

Officer and Ekdale invoke "condensation" of the Danish boundary clay (Fish Clay) to explain the fourfold enrichment in carbon content. This is a sham issue, as the real question is not the fourfold higher carbon content, but the 1000-fold shorter deposition time, which, in turn, hinges on the meteoritic nature of the boundary layer. Moreover, at two New Zealand sites, the soot content rises by factors of at least 40 and 800 (1). Nonetheless, we shall briefly respond to their arguments.

1) We agree that there is some evidence for a *small* degree of carbonate dissolution in the Fish Clay (15). Possible causes are local formation of sulfuric acid by oxidation of pyrite or a global increase in atmospheric-oceanic  $\text{CO}_2$  content after a major fire. However, we find the evidence for a *large* "dissolution pulse" (15) quite unconvincing. The arguments at best are permissive but not compelling and at worst are ad hoc, designed to deny the role of meteorite impact. What Maxwellian demon protected the uppermost Cretaceous sediments, only centimeters below, from this "dissolution pulse"?

2) The putative factors by which the boundary layer "condensed" are not self-consistent: 4 for C, 7 for clay, and 2000 for Ir, when one uses the Ir-profile of (4) as an example. The Ir value requires that the boundary layer initially was some 600 meters thick and contained 99.95% carbonate!

3) Officer and Ekdale imply that Fish Clay is an artifact produced from a normal boundary section by selective dissolution of carbonate and cite as examples Dania (no Fish Clay, 4 parts per billion of Ir) and Stevns Klint (Fish Clay, 29 to 87 parts per billion of Ir). However, Ekdale in an earlier paper (15) acknowledged that the Dania site is "badly disturbed by relatively recent brecciation and apparent tectonic movement,"

and "thus may not reflect a continuous sedimentary sequence." Absence of evidence is not evidence of absence, especially in a section previously acknowledged to be incomplete.

4) The K-T sequence in Denmark, although well studied, is badly disturbed and hence is not suitable for generalization. However, Smit and Romein (13), who have studied 22 K-T sites all over the world, conclude from this much larger data base that a boundary clay layer with Ir and microtektites is the norm rather than the exception. If it is missing at a particular site, this implies a later disturbance, as evidenced by a break in the fossil record (13). We refer Officer and Ekdale to Ekdale and Bromley (15), who found ample evidence for precisely such disturbance: "The clay layer obviously has served as a zone of weakness and as a lubrication plane for geologically recent movements," and "this carbonaceous, pyritic microfacies *pinches out* laterally up the flanks of the chalk mounds, so that it only occurs in the bottoms of the small troughs between the mounds" (italics ours).

For a different view of K-T stratigraphy in Denmark, we refer the reader to three recent references not quoted by Officer and Ekdale (4, 13, 16).

EDWARD ANDERS

WENDY S. WOLBACH

ROY S. LEWIS

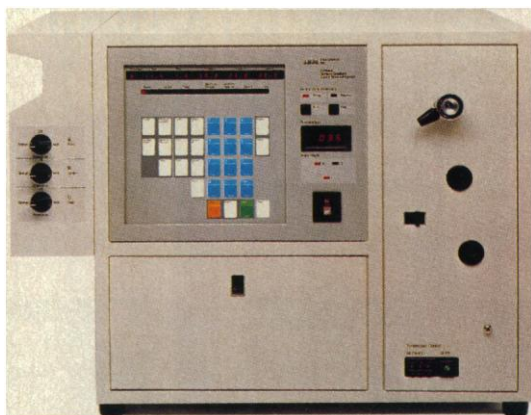
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## REFERENCES

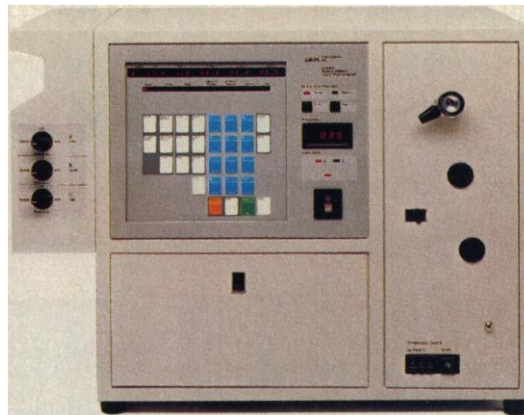
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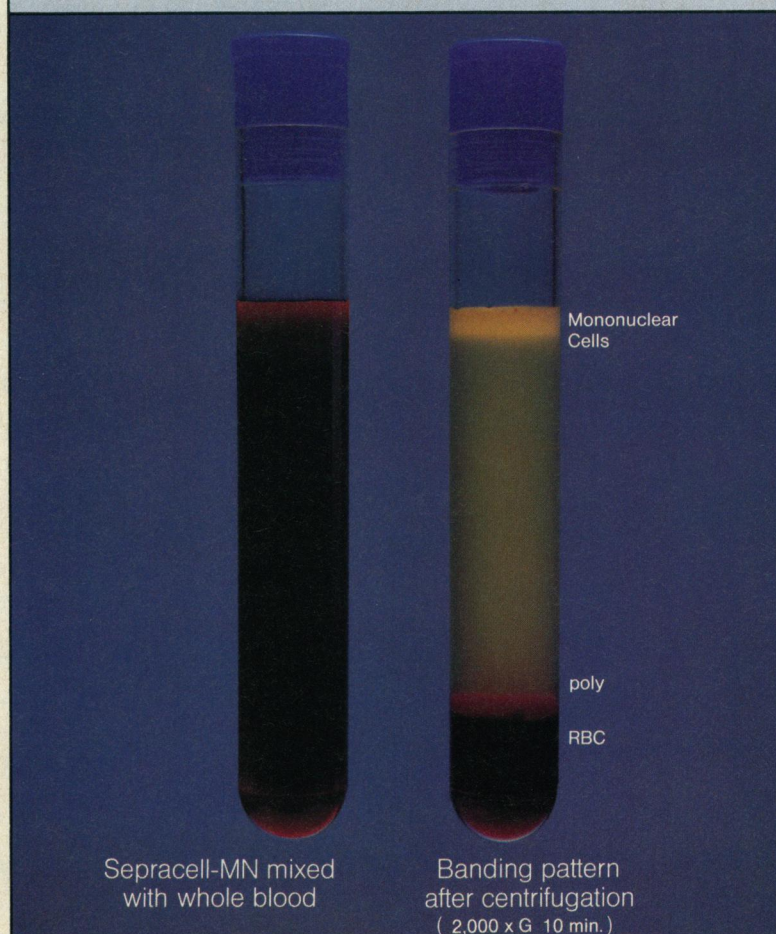
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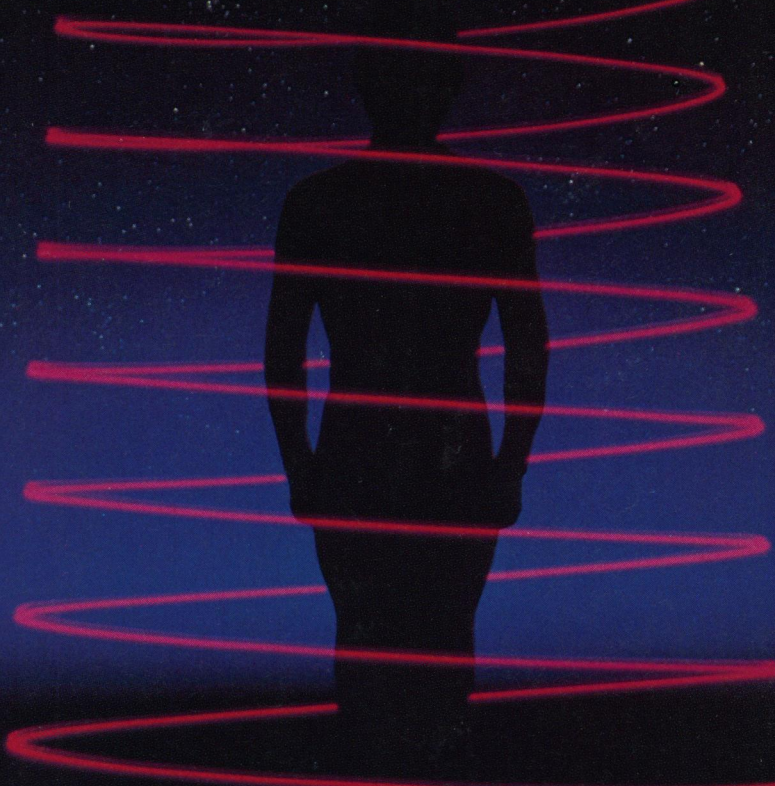
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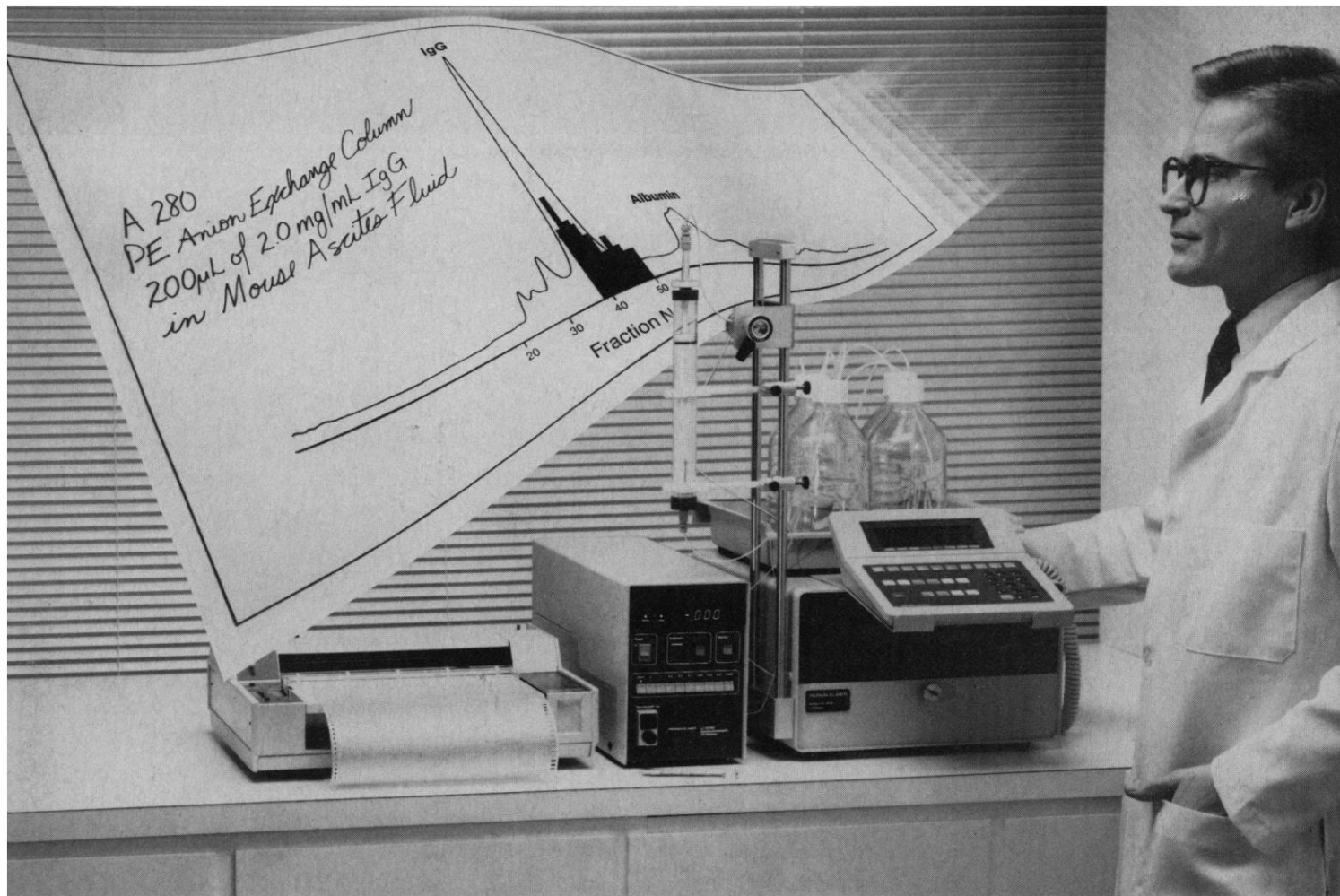
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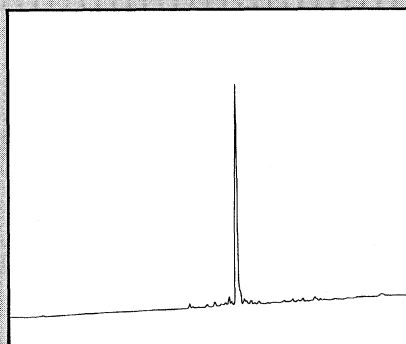
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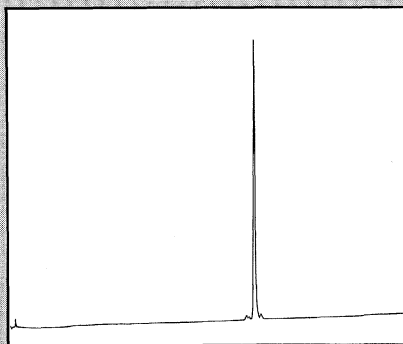
PEPTIDE SEQUENCE	LEU	HIS	PHE	PRO	HIS	ILE	TYR	VAL	ARG	ASP	AVG. STEP YIELD %
Ninhydrin Analysis	•	96.7	99.7	99.7	99.6	98.9	99.5	98.3	99.5	99.4	99.0
Preview Sequence Analysis	•	•	•	99.5	99.2	94.9	96.6	96.5	97.1	97.9	97.4
RESIDUE NUMBER	10	9	8	7	6	5	4	3	2	1	

\*Ninhydrin values for amino acids coupled to proline are not quantitative.



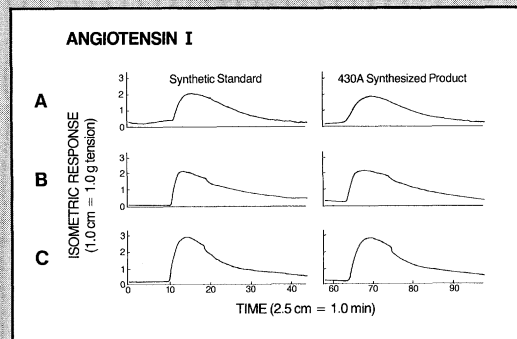
**Angiotensin I, Crude**

mobile phase 0.1% TFA/CH<sub>3</sub>CN  
gradient 0 to 60% in 60 minutes  
flow rate 1.0 mL/min  
detector 216 nm  
column Brownlee, C-8, 300Å, 10µm  
4.6 mm x 250 mm



**Angiotensin I, HPLC Purified**

mobile phase 0.1% TFA/CH<sub>3</sub>CN  
gradient 0 to 60% in 60 minutes  
flow rate 1.0 mL/min  
detector 216 nm  
column Brownlee, C-8, 300Å, 10µm  
4.6 mm x 250 mm



Panels A, B and C are isometric responses of two different Ile<sup>5</sup>-Angiotensin I—a synthetic standard and the 430A-produced, purified peptide—on three separate rabbit aortic strips. The responses produced by the Applied Biosystems Ile<sup>5</sup>-Angiotensin I were not significantly different than those of the standard. Sample concentrations were: in panel A, 564 ng/mL; in panels B and C, 500 ng/mL.

These response data were furnished by Drs. M. C. Khosla and A. Husein of the Cleveland Clinic Foundation.



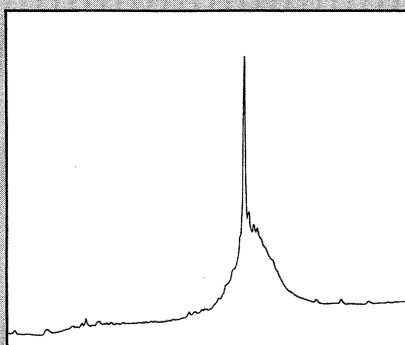
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Step Yield (% Coupled) Standard ABI t-boc cycles, version 1.0

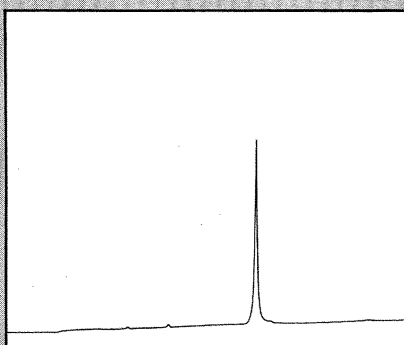
PEPTIDE SEQUENCE					GLY	GLY	LYS	GLU	SER	ARG	GLY	GLN	GLN	VAL	PRO	PRO	GLY	ASP	ARG	GLN	ALA	GLU	VAL	LEU	
Ninhydrin Analysis					99.7	99.8	99.5	99.4	99.2	99.6	99.4	99.6	99.2	98.0	97.0	99.8	99.1	98.9	99.0	99.1	98.7	98.6	98.5	98.5	
Preview Sequence Analysis					•	•	99.6	99.6	99.5	99.6	99.5	•	•	99.1	•	1	98.9	99.0	99.0	98.6	98.7	98.6	98.5	98.4	
RESIDUE NUMBER					67	66	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	
→	LYS	SER	TYR	ASP	PHE	SER	ASP	GLY	SER	GLU	GLU	TYR	GLU	ALA	ASN	LEU	GLU	ALA	ASP	LEU	THR	THR	GLN	ALA	LEU
	95.8	97.4	97.2	97.8	98.3	98.3	97.9	96.9	98.5	98.3	98.0	97.1	97.2	98.2	96.9	98.1	97.7	98.0	98.0	98.2	97.6	95.0	82.7	96.0	96.1
	98.5	98.5	98.5	98.5	98.8	97.9	98.0	97.8	97.0	•	•	98.8	•	99.3	99.3	99.3	98.9	99.1	98.9	93.9	•	•	98.4	99.0	98.1
	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23
→	VAL	ARG	ALA	GLN	SER	SER	GLN	ARG	ASN	ARG	SER	SER	SER	SER	ALA	PRO	ARG	SER	SER	SER	NET	AVG. STP. YIELD %			
	96.1	94.9	95.2	94.6	95.5	95.5	96.4	92.5	92.2	91.7	93.9	95.0	96.7	96.2	94.5	94.8	94.4	95.0	97.2	•	•	95.9	96.5	96.9	
	98.3	98.5	98.0	96.8	•	•	•	•	97.9	•	•	•	•	•	•	95.2	95.1	97.2	•	•	•	•	•		
	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	98.9		
→																									

\*These are amino acid resin samples from the first coupling of the HOBT ester double couple cycles used for the Arg, Asn and Gln couplings. The calculation of the average step yield excludes these (\*) residues. †Ninhydrin values for amino acids coupled to proline are not quantitative.



**M-67-G (CONH<sub>2</sub>), Crude**

mobile phase 0.1% TFA/CH<sub>3</sub>CN  
gradient 0 to 60% in 60 minutes  
flow rate 1.0 mL/min  
detector 214 nm  
column Brownlee, C-8, 300Å, 10 µm  
4.6 mm x 100 mm



**M-67-G, (CONH<sub>2</sub>), Purified**

mobile phase 0.1% TFA/CH<sub>3</sub>CN  
gradient 0 to 60% in 60 minutes  
flow rate 1.0 mL/min  
detector 214 nm  
column Brownlee, C-8, 300Å, 10 µm  
4.6 mm x 250 mm

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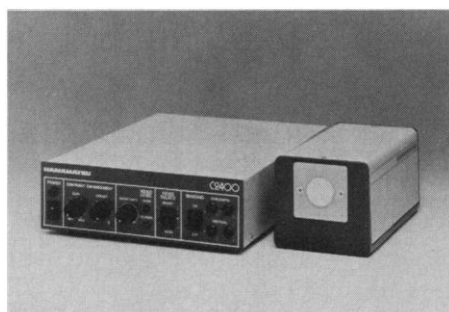


# Four ways to improve your image.

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**C2400 VIDEO CAMERA.** Exceptional performance characteristics plus a variety of unique, user-oriented features enable the C2400 Video Camera to accurately detect details that are invisible with conventional video cameras. A modular control unit supports all available camera heads, and application-specific configurations are easily obtained through a wide choice of options and imaging tubes.

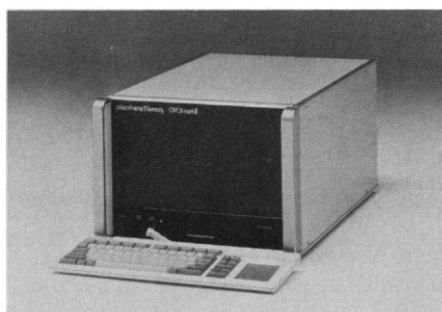
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**C1901 IMAGE PROCESSOR.** This unique digital image processor employs two 16-bit video frame memories and executes a wide range of processing functions. Real-time features such as image integration, background subtraction and shading

correction, as well as 3-D graphics and pseudocolor, make this system ideal for both image enhancement and low light level imaging.

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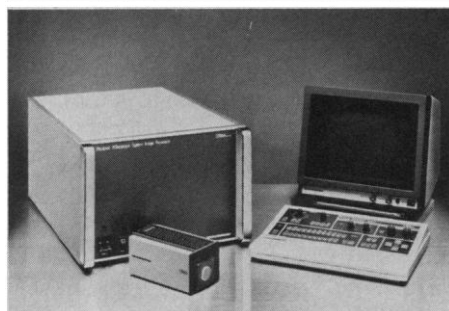


## **C1966 AVEC SYSTEM.**

A totally integrated, turnkey imaging system with extensive enhancement and real-time digital processing capabilities. The C1966 AVEC

system can dramatically improve image quality and detectability when visualizing low contrast, low intensity and dynamic specimens. A wide selection of video detectors is available, with characteristics ranging from high resolution to high sensitivity, from UV to IR. Highly flexible and easy to use.

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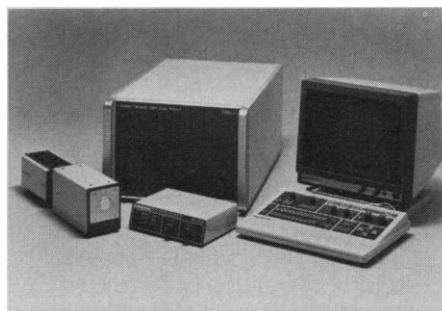


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Some of the international meetings scheduled for 1987 are:

## Herpes and Papilloma Viruses

Milan, Italy / March 26-27

Scientific Organization: F. De Palo (I), F. Rilke (I) and H. Zur Hausen (D)

## IV Pan American Congress of Andrology

São Paulo, Brazil / May 4-6

Scientific Organization: A. Negro-Vilar (USA) and M. P. De Castro (BZ)

## Inhibin - Non-Steroidal Regulation of Follicle Stimulating Hormone Secretion

Tokyo, Japan / May 21-22

Scientific Organization: H. Burger (Aus) and M. Igarashi (J)

## Development and Function of the Reproductive Organs

Turku, Finland / June 10-12

Scientific Organization: M. Parvinen (SF)

## IV Colloquium of the European Pineal Study Group

Modena, Italy / August 31 - September 4

Scientific Organization: G.P. Trentini (I), A. Oksche (D) and P. Pèvet (F)

## Cell-to-Cell Communication in Endocrinology

Florence, Italy / October 8-9

Scientific Organization: L. Martini (I), M. Serio (I) and C.W. Bardin (USA)

## Differentiation Therapy for Cancer

Tucker's Town, Bermuda / October 23-25

Scientific Organization: G.B. Rossi (I), F. Takaku (J) and S. Waxman (USA)



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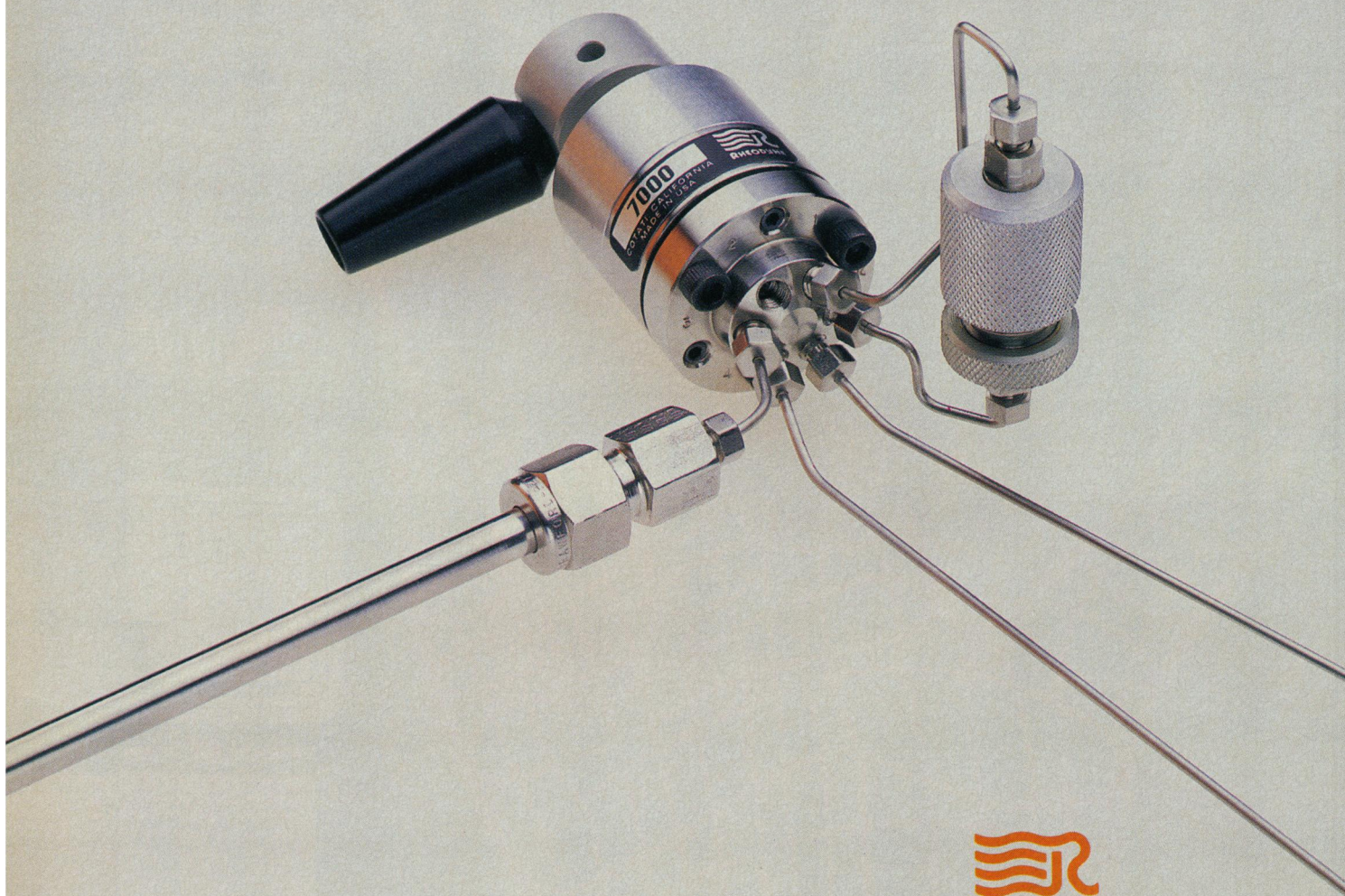
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# AAAS

## ANNUAL MEETING

### II. Life Sciences and Technology

**Ecology:** Biological Invasions; Deep-Sea Vents & Cold-Water Seeps; Large Marine Ecosystems

**Ecology—Great Lakes:** Socio-Economic Issues; Contaminant Issues; Physical Problems; Stock Assessment.

**Molecular Biology:** Human Genome; Leukemias and Lymphomas; Chromosome Abnormalities and Cancer; Biochemistry

**Biomedical Technology:** Medical Imaging; Transformation of Scientific Practice; Communication for Voiceless; Corporate-Academic Ties

**Medical Sciences:** Immunoassays; Mouth Infections (Herpes, AIDS); Neural Transplantation; Strategy for AIDS; Protein Drugs; Noise Pollution

**Biomedical Ethics:** Decisions for Critically Ill; Gene Therapy; Use of Microorganisms

**Health Policy:** Black and Hispanic Health Care; Health Policy Agenda; Technology Assessment of Health Care; Demographic Perspectives on Cause of Death; Teratologic Developmental Defects

**Agricultural Research:** Rhizosphere Dynamics; Plant Biotechnology; Antibiotic and Pesticide Resistance

**Agricultural Policy:** Public Perception of Farming; 1985 Food Security Act.

**Frontiers of Neuroscience:** A feature of this year's Annual Meeting will be a three-day seminar on The Frontiers of Neuroscience, organized by Dr. Daniel Alkon and featuring the leaders in this rapidly developing field. There is an EXTRA CHARGE for attending this seminar in ADDITION TO REGISTRATION FEE for the Meeting:

\$60 for AAAS Members      \$85 for non-members

TO RECEIVE AN APPLICATION FOR THIS SEMINAR: WRITE "NEUROSCIENCE" ON YOUR MEETING REGISTRATION FORM WHEN YOU RETURN IT TO US.

#### Other subject areas of Meeting:

- I. Physical Sciences & Technology
- III. Social & Behavioral Sciences
- IV. International Science & Policy

Watch this space for  
advance notices  
of the Meeting

See 12 December  
issue of SCIENCE  
for full program or write:  
AAAS Meetings Office  
1333 H St NW,  
Washington DC 20005

# CHICAGO

14-18 FEBRUARY 1987



## Advance Registration Form

S2

### AAAS Annual Meeting ♦ Chicago ♦ 14 – 18 February 1987

Mail to: AAAS Meetings Office, Annual Meeting Registration, 1333 H Street, NW, Washington, DC 20005

#### Please Print or Type

Name of registrant \_\_\_\_\_  
(Last) (First & initial)

Name of spouse registrant \_\_\_\_\_  
(Last) (First & initial)

Institution/Company \_\_\_\_\_  
(To be printed on badge) (Registrant)

\_\_\_\_\_  
(Spouse registrant)

Mailing address \_\_\_\_\_  
(Street)

\_\_\_\_\_  
(City/State) (Zip code) (Telephone number)

Convention address \_\_\_\_\_  
(Where you can be reached) (Hotel and/or telephone number)

Sat Sun Mon Tue Wed

Check days on which you will attend meeting: ☐ ☐ ☐ ☐ ☐

☐ Check here if you need special services due to a handicap. We will contact you before the meeting.

■ Your registration badge, receipt, and voucher for full Program and Abstracts will be mailed to you in early January. ■ Registrations received after 30 January will be held at the Advance Registrants' Desk at the Hyatt Regency Hotel. ■ Refund requests must be made by letter or telegram to the above address before 6 February 1987 and will be honored after the Meeting. No refunds are made on cancellations received after this date. ■ Student registration fees apply to full-time undergraduate or graduate students only.

\*Membership includes 51 issues of *Science*. Inquire for Canadian and other foreign rates.

Name(s) of new member(s): \_\_\_\_\_

#### Registration Fees:

Members (check appropriate box):

☐ Regular (\$65) ..... \$ \_\_\_\_\_  
☐ Student ☐ Retired ☐ H.S. Teacher  
or ☐ Spouse of registrant (\$35) ..... \$ \_\_\_\_\_

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or ☐ Spouse of registrant (\$45) ..... \$ \_\_\_\_\_

#### Join AAAS — register as a member:

(Add dues to member registration fee above)

\*Single membership dues (\$65) ..... \$ \_\_\_\_\_

\*Double [member & spouse] (\$82) ..... \$ \_\_\_\_\_

\*Single student or retired (\$40) ..... \$ \_\_\_\_\_

\*Double student or retired (\$57) ..... \$ \_\_\_\_\_

Retired or spouse membership  
without *Science* (\$17) ..... \$ \_\_\_\_\_

TOTAL AMOUNT ..... \$ \_\_\_\_\_

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Signature \_\_\_\_\_

## Hotel Reservation Form ♦ Hyatt Regency Chicago

### AAAS Annual Meeting ♦ Chicago ♦ 14 – 18 February 1987

Mail to: Reservations, Hyatt Regency Chicago, 151 East Wacker Drive, Chicago, IL 60601

Send confirmation to:

Name \_\_\_\_\_  
(Last) (First & initial)

Mailing address \_\_\_\_\_  
(Street)

\_\_\_\_\_  
(City/State) (Zip code) (Telephone number)

Other occupant(s) of room: \_\_\_\_\_  
(Name) (Name)

Indicate special housing needs due to a handicap:

☐ wheelchair accessible room; other \_\_\_\_\_

Charge my major credit card (card type): \_\_\_\_\_

Card No. \_\_\_\_\_ Expires \_\_\_\_\_

Signature \_\_\_\_\_

**Hyatt Regency Hotel Rates:** Add 10.1% state and city sales tax. Check appropriate box for type of room desired.

Room Category	Single	Double or Twin	Parlor + 1 Bedrm.	Parlor + 2 Bedrms.
Standard	<input type="checkbox"/> \$79	<input type="checkbox"/> \$96	<input type="checkbox"/> \$300 & up	<input type="checkbox"/> \$379 & up
Club Level	<input type="checkbox"/> \$102	<input type="checkbox"/> \$118		

Arrival date \_\_\_\_\_

Time \_\_\_\_\_ ☐ a.m. ☐ p.m.

Departure date \_\_\_\_\_

Time \_\_\_\_\_ ☐ a.m. ☐ p.m.

Be sure to list definite arrival and departure dates and times. reservations will be held only until 6 p.m. unless accompanied by 1 night's deposit or major credit card guarantee.

■ Reservations must be submitted to the Hyatt Regency (address above) on this official form by **23 January 1987**. Reservations received after this cut-off date are conditional on space availability. ■ Make any changes or cancellations directly with the hotel, which will also confirm your reservations.

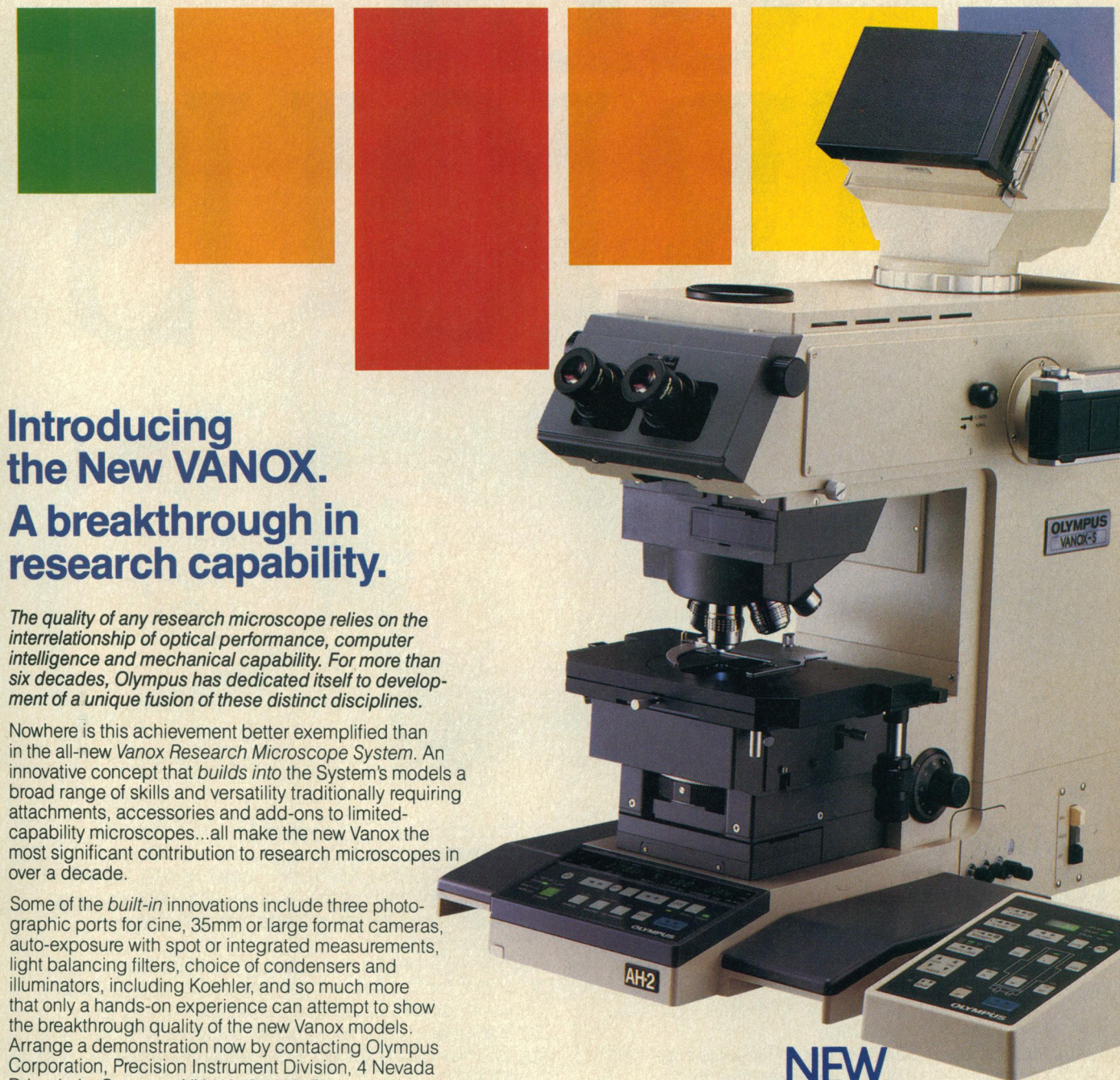
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■ Children to age 18 free of charge in same room with parents.



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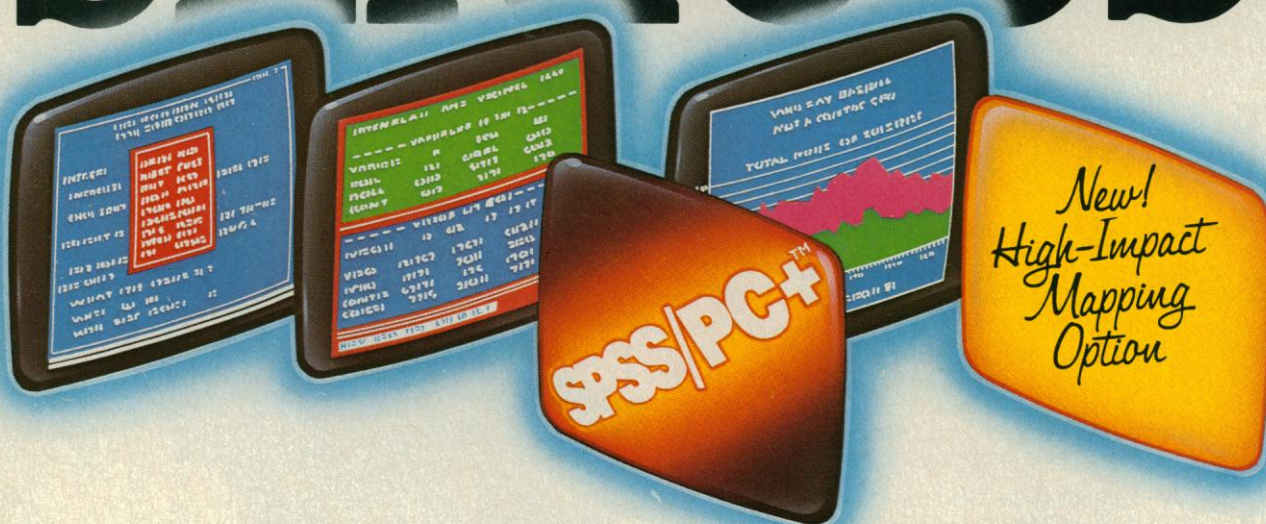
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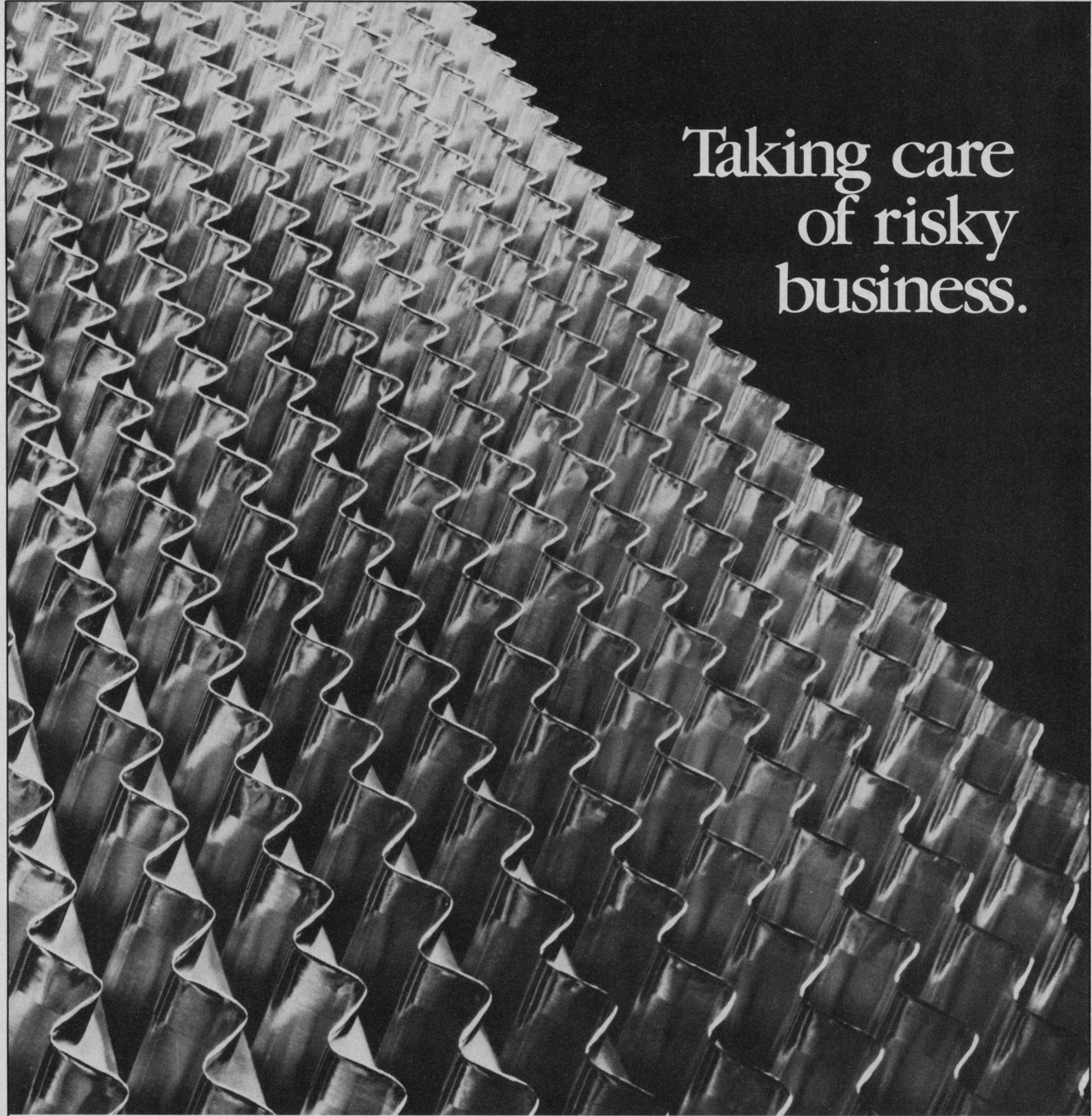
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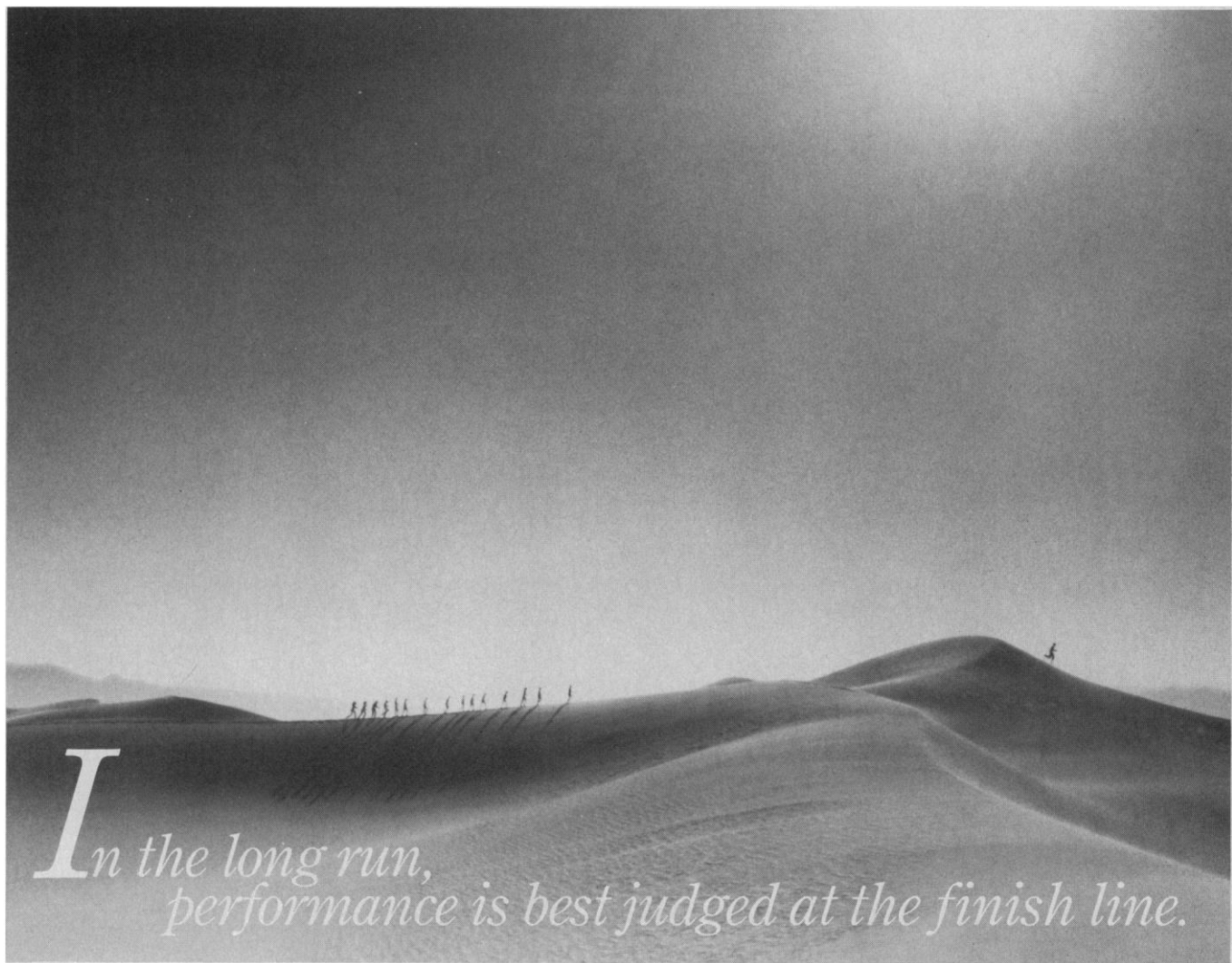
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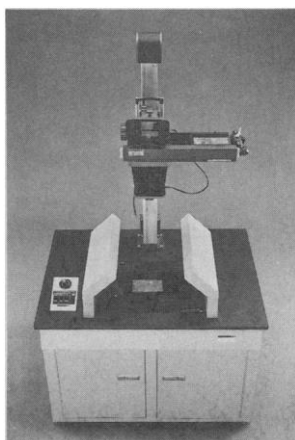
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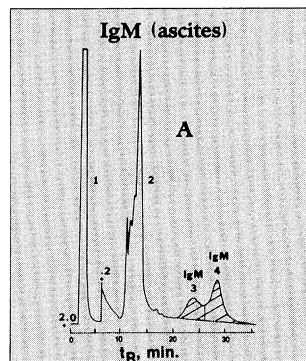
“There is an enormous area in here, where man will start to try, with simple organic chemistry, to mimic antibodies, and I think Baker has now done that.”

—Fred Regnier to the  
1986 Pittsburgh Conference

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A technological advance for immunoglobulin purification.

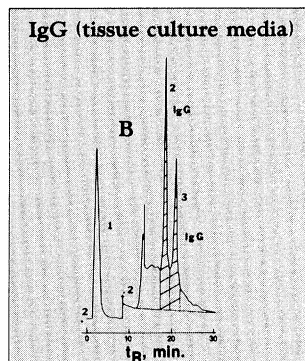
The separation of antibodies derived from double producing hybridomas shown below, is an example of ABx™ resolving power.



### ANALYTICAL CONDITIONS:

**Column:** Bakerbond ABx,™  
4.6 x 250 mm, 5 micron  
**Mobile Phase:** A=10mM KH<sub>2</sub>PO<sub>4</sub>, pH 6.0  
B=500mM KH<sub>2</sub>PO<sub>4</sub>, pH 6.8  
0% B to 50% B over 60 min.  
**Gradient:**  
**Flow Rate:** 1mL/min.  
**Pressure:** 1,000 PSI  
**Detection:** UV at 280nm; AUFS: see +  
**Peaks:**  
1. Albumins, transferrin  
2. Weakly bound proteins  
3. IgM  
4. IgM  
**Sample:** Mouse ascites fluid 0.5 mL  
**IgM Purity:** Greater than 95%  
Separation of Monoclonal Antibodies from  
Double-Producing Hybridomas

+ Peak 1 of non-retained proteins represents 90-95% of all non-immunoglobulin proteins. Detector sensitivity for all other retained peaks has been increased ten-fold to emphasize retained proteins and monoclonal antibodies.



### ANALYTICAL CONDITIONS:

**Column:** Bakerbond ABx,™  
4.6 x 250 mm, 5 micron  
**Mobile Phase:** A=10mM MES, pH 6.0  
B=250mM KH<sub>2</sub>PO<sub>4</sub>, pH 6.8  
0% B for 10 min.  
**Gradient:** Step gradient to 20% B  
20% B to 50% B over 60 min.  
**Flow Rate:** 1 mL/min.  
**Pressure:** 1,000 PSI  
**Detection:** UV at 280 nm; AUFS: see +  
**Peaks:**  
1. Albumins, transferrin  
2. IgG  
3. IgG  
**Sample:** Tissue Culture Media 0.5 mL  
**Purity:** 2. greater than 95%  
3. greater than 95%

J.T. Baker has developed Bakerbond ABx (antibody exchanger), a patented, highly-resolving silica-based “mixed mode” chromatographic matrix which provides rapid purification of immunoglobulins from any biological fluid.

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In pioneering work with applications for space-based defense systems and the next generation of missile seekers, Hughes Aircraft Company has demonstrated an advanced infrared sensor. The device is believed to be the world's first high-density, staring, long-wavelength infrared focal plane array (FPA). The hybrid chip, smaller than a fingernail, is integrated with optics and electronics to create TV-like images of a scene, even in total darkness. Unlike conventional infrared sensors, which mechanically scan a scene by means of oscillating or rotating mirrors, the FPA stares at a scene in its view at one time. It promises significant performance, size, weight, and cost benefits over ordinary sensors. The device was developed for the Defense Advanced Research Projects Agency as part of Strategic Defense Initiative efforts.

Programmable software formats within a night vision system for helicopters allow new features to be added as needed to meet new threats. The Hughes Night Vision System (HNVS) is a low-cost, forward-looking infrared system that provides excellent imagery and object detection day or night in all weather. It has extensive built-in test and fault isolation test capabilities. Among the features that may be modified to meet specific requirements are flight symbology, navigational data, automatic set-up mode, system status data, and push-buttons around the display face.

From Alaska to Florida, from Labrador to Hawaii, a new air defense system helps protect North America by watching the skies far beyond U.S. and Canadian borders. The Joint Surveillance System (JSS) can detect attacks from space, by aircraft, and by missiles launched from submarines. The system is comprised of eight regional operations control centers that tie into existing civilian and military radars. Each center receives radar data through a communications network with 285 circuits. Computers process information, prepare it for display consoles, and compare it with known flight plans. When an aircraft is classified as unknown, fighter interceptors scramble and are directed to make visual identification. Hughes developed and built JSS for the U.S. Air Force.

F-4F Phantoms equipped with the same radar carried by F/A-18 Hornet Strike Fighters will maintain their effectiveness through the end of the century. The AN/APG-65 radar is an all-digital multimode system designed for both air-to-air and air-to-surface missions. In air-to-air operations, the Hughes radar will give the Phantom a clean radar scope in either look-up or look-down attitudes. It will also provide track-while-scan capability, long-range search and track, and close-in combat modes. The all-weather sensor will make the aircraft fully AIM-120 AMRAAM capable. Hughes is under contract from Messerschmitt-Boelkow-Blohm for the definition phase of West Germany's F-4F Improved Combat Efficiency program. The company will also work with AEG-Telefunken on the program.

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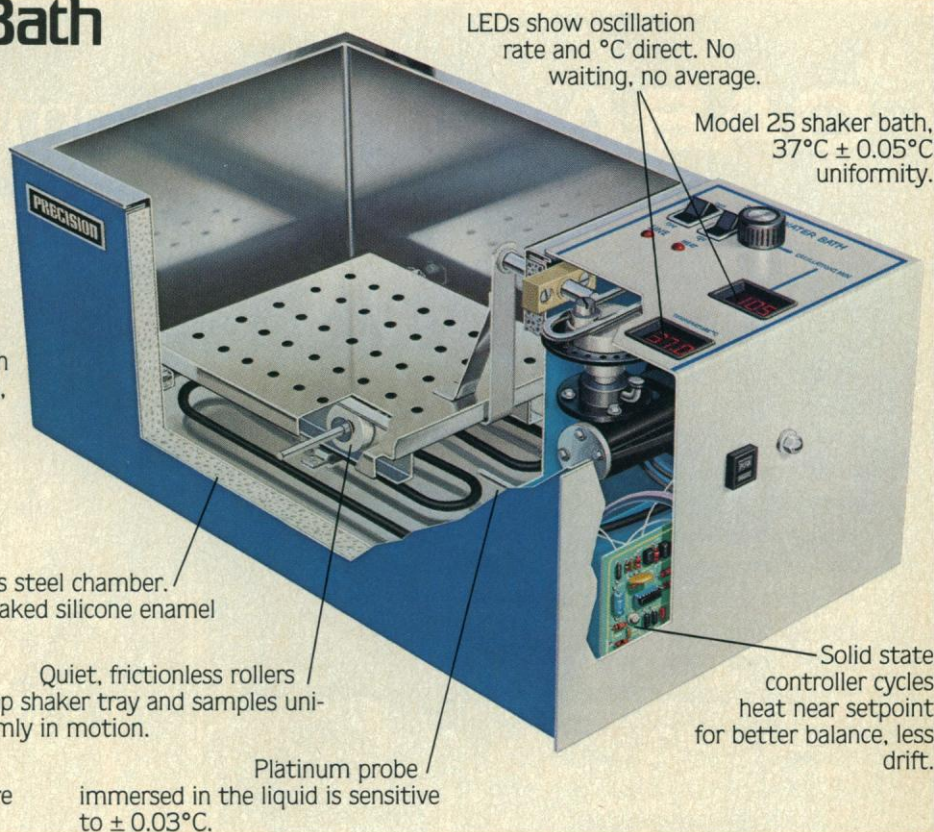


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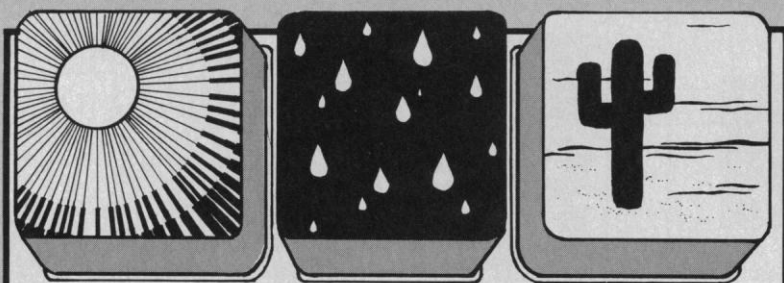


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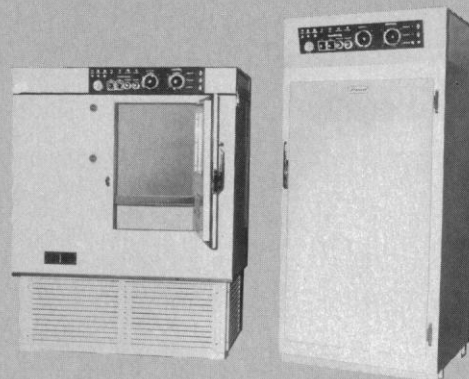
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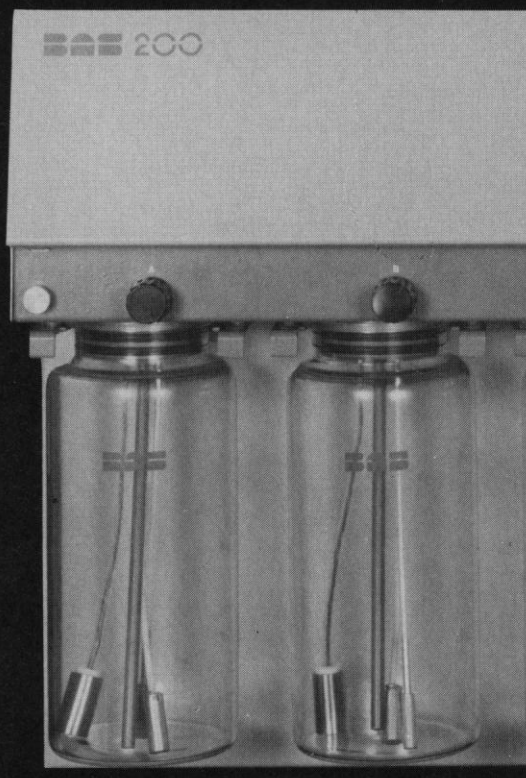
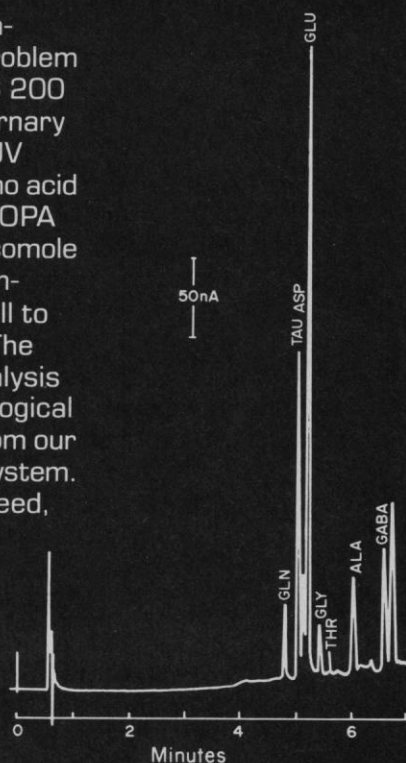
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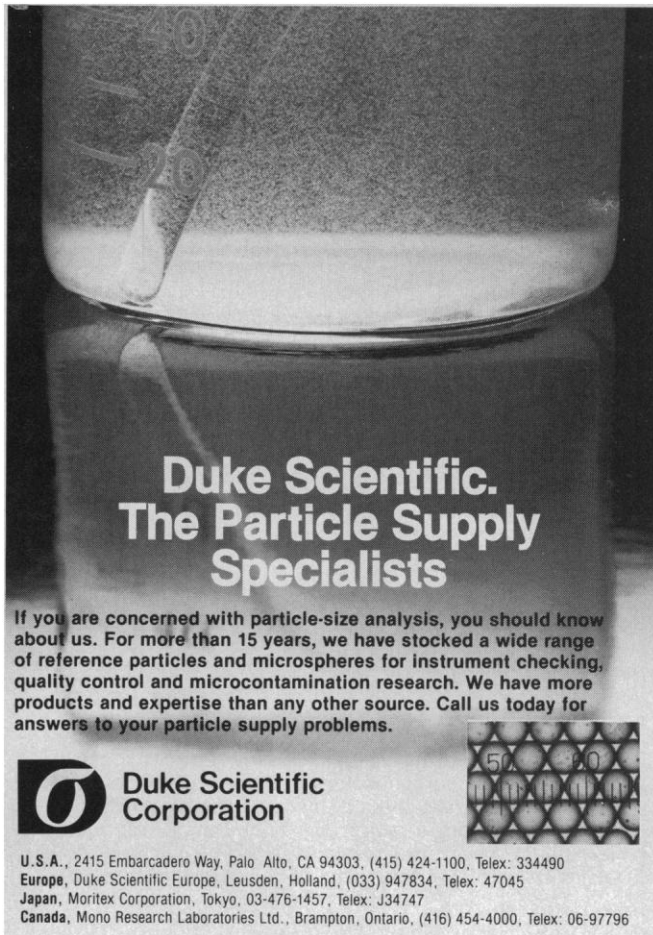


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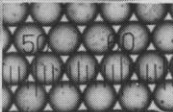
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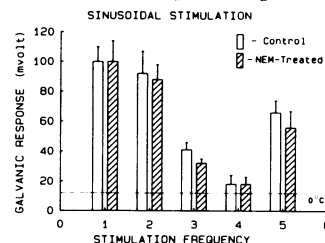
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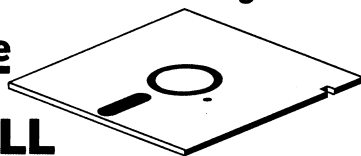
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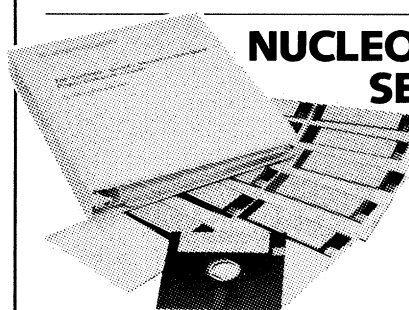
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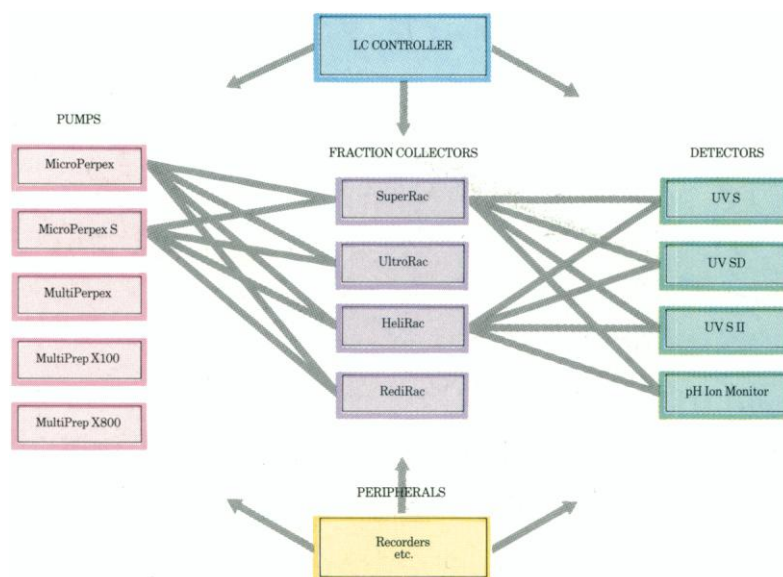
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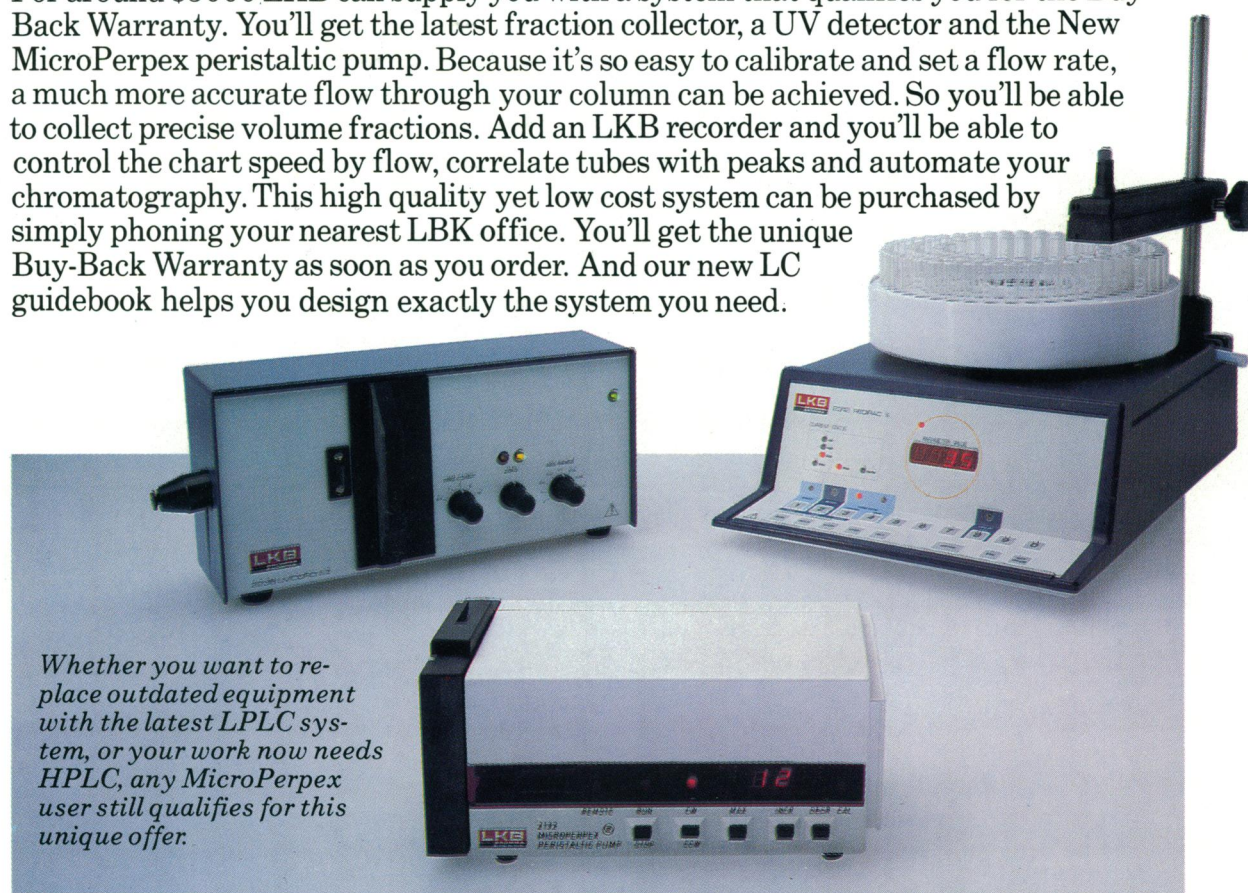
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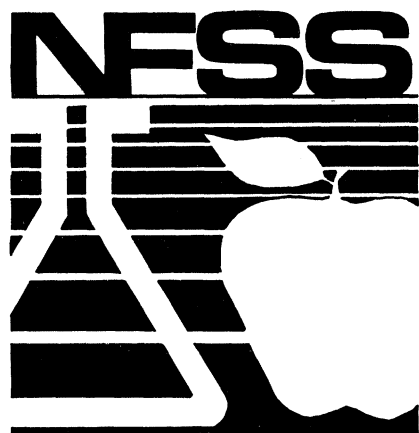
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