24 February 1978 • Vol. 199 • No. 4331

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SCIENCE

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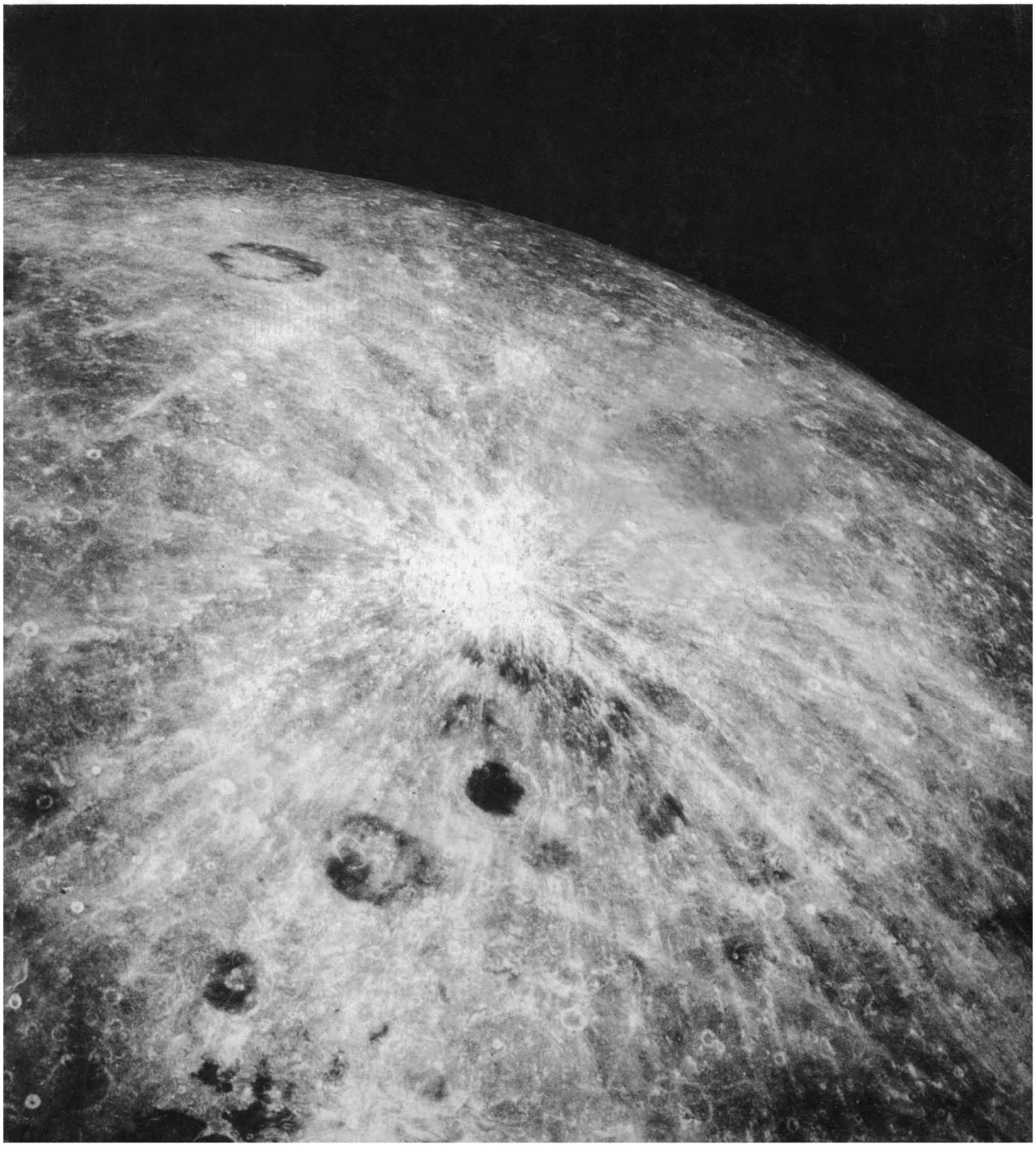

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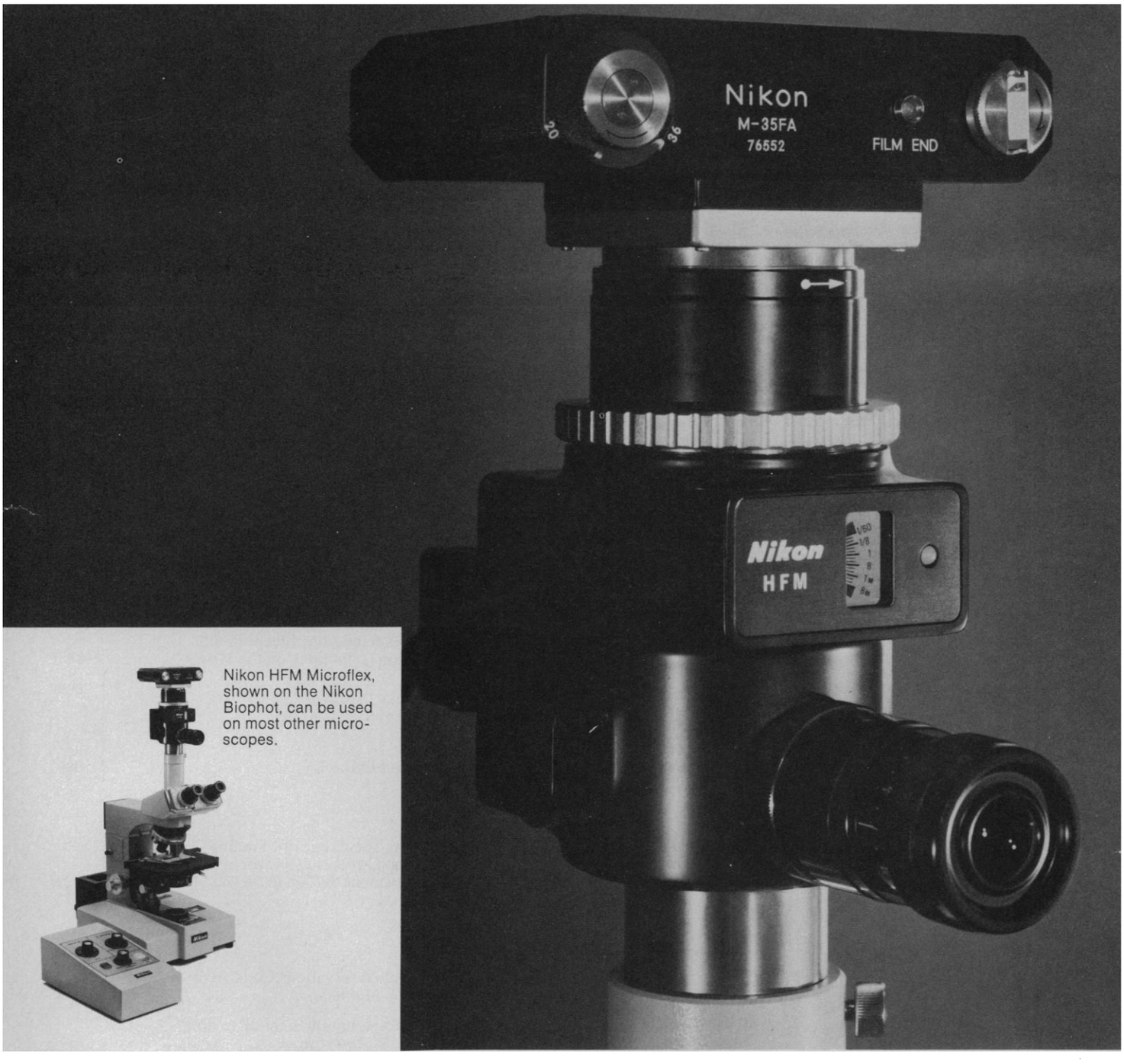

Nikon HFM Microflex, shown on the Nikon Biophot, can be used on most other microscopes.

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ISSN 0036-8075

24 February 1978

Volume 199, No. 4331

SCIENCE

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

Apollo 13 photograph of the region around crater Giordano Bruno, described by astronauts as one of the most striking of lunar features. It is the small crater near center, with large system of bright rays, evidence of geologically recent origin. Identifiable larger craters clustered just to the south are Joliot, Lomonosov, Maxwell, and Szilard. See page 875. [Courtesy of National Space Center Data Center]

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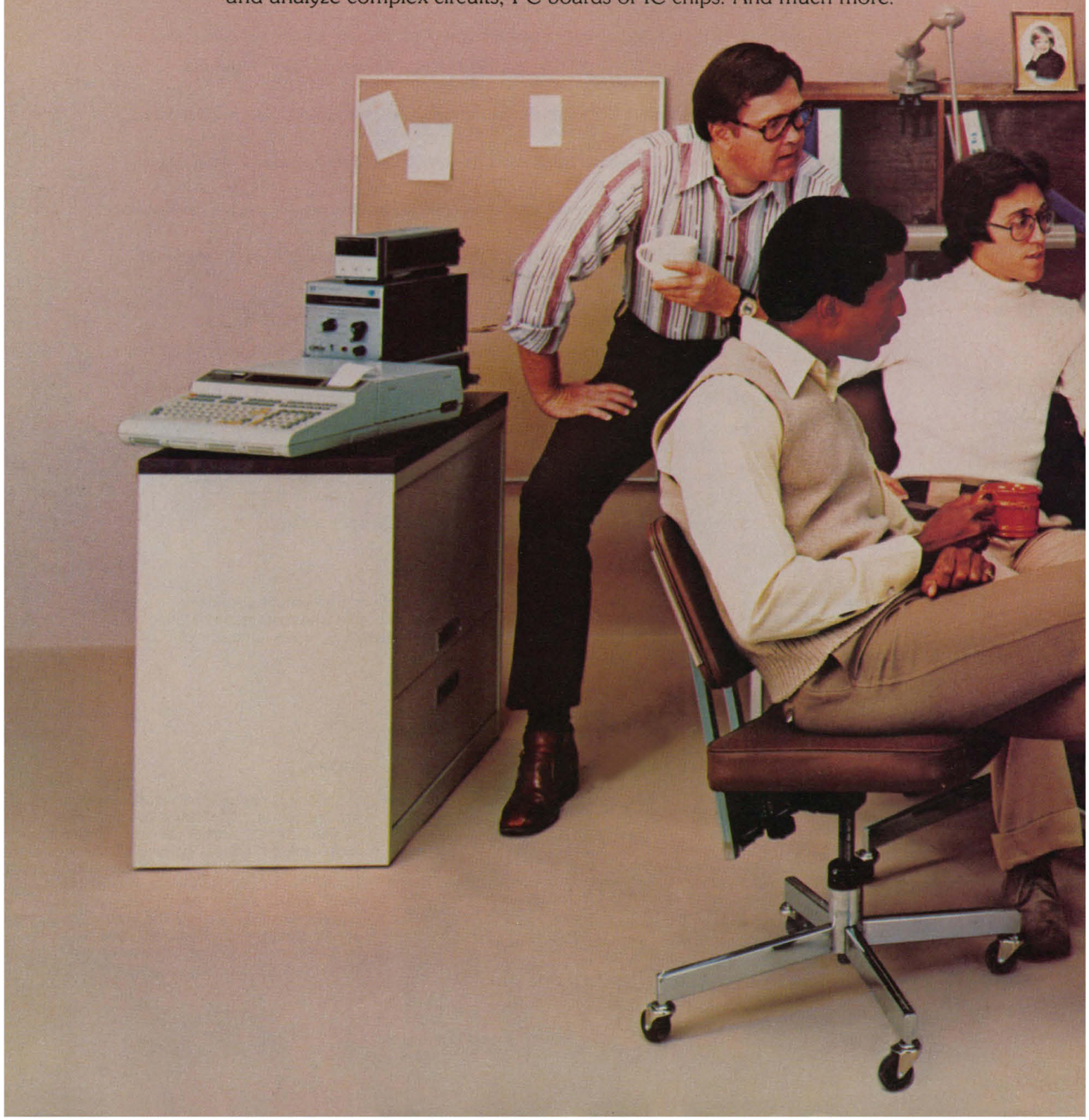

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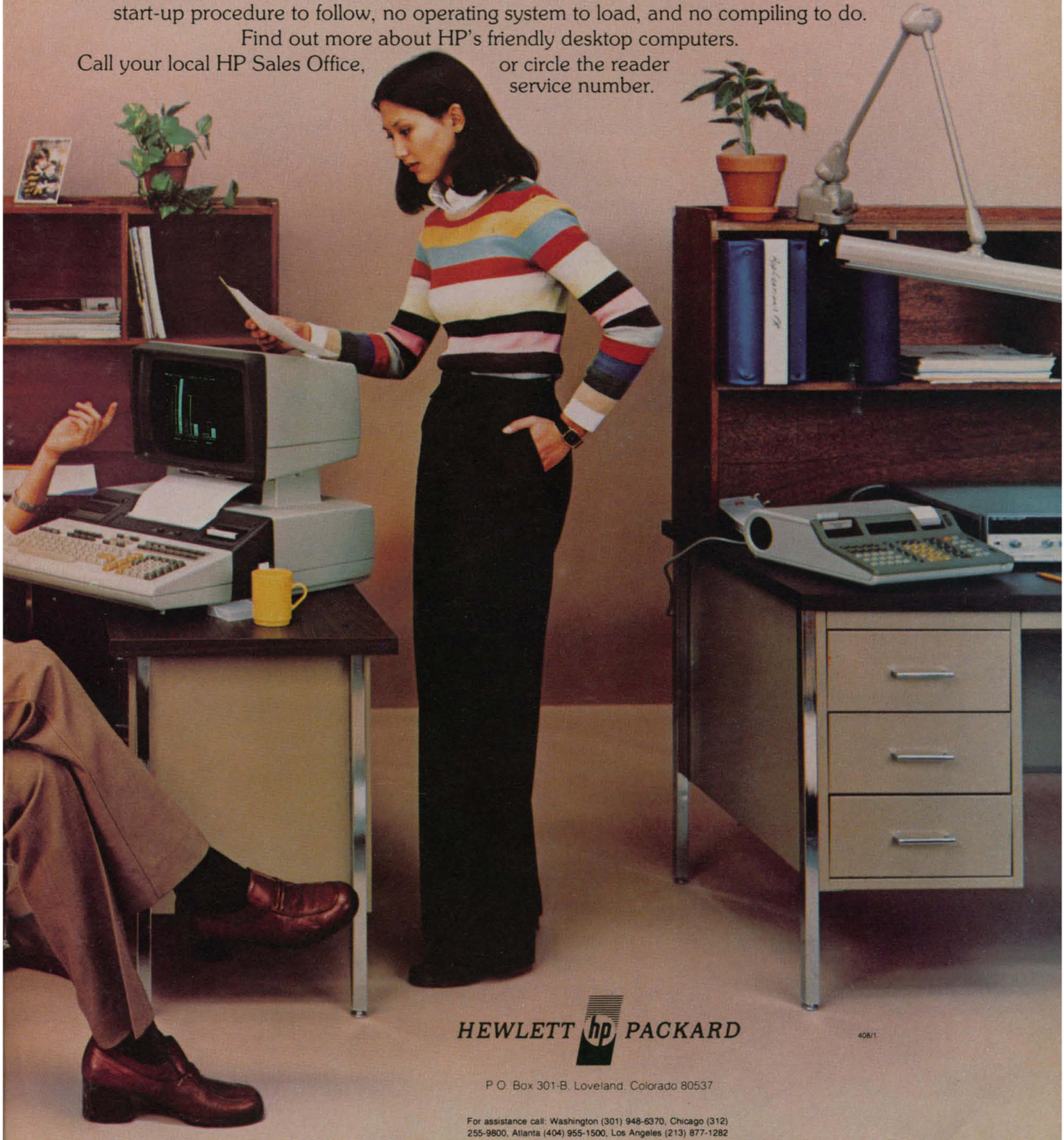

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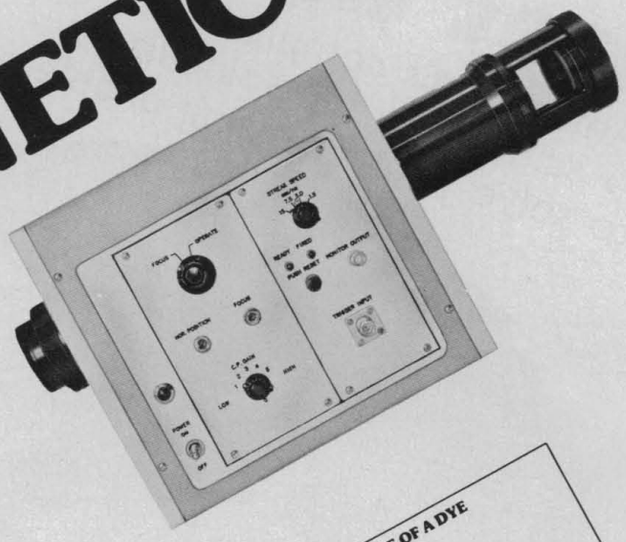

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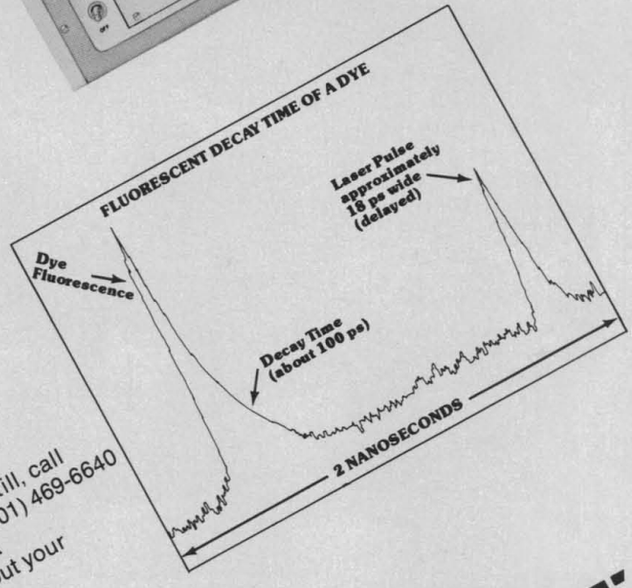

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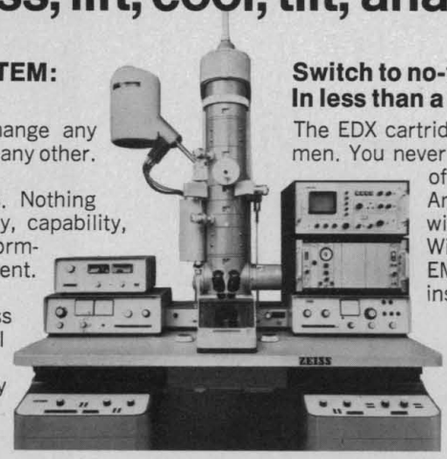

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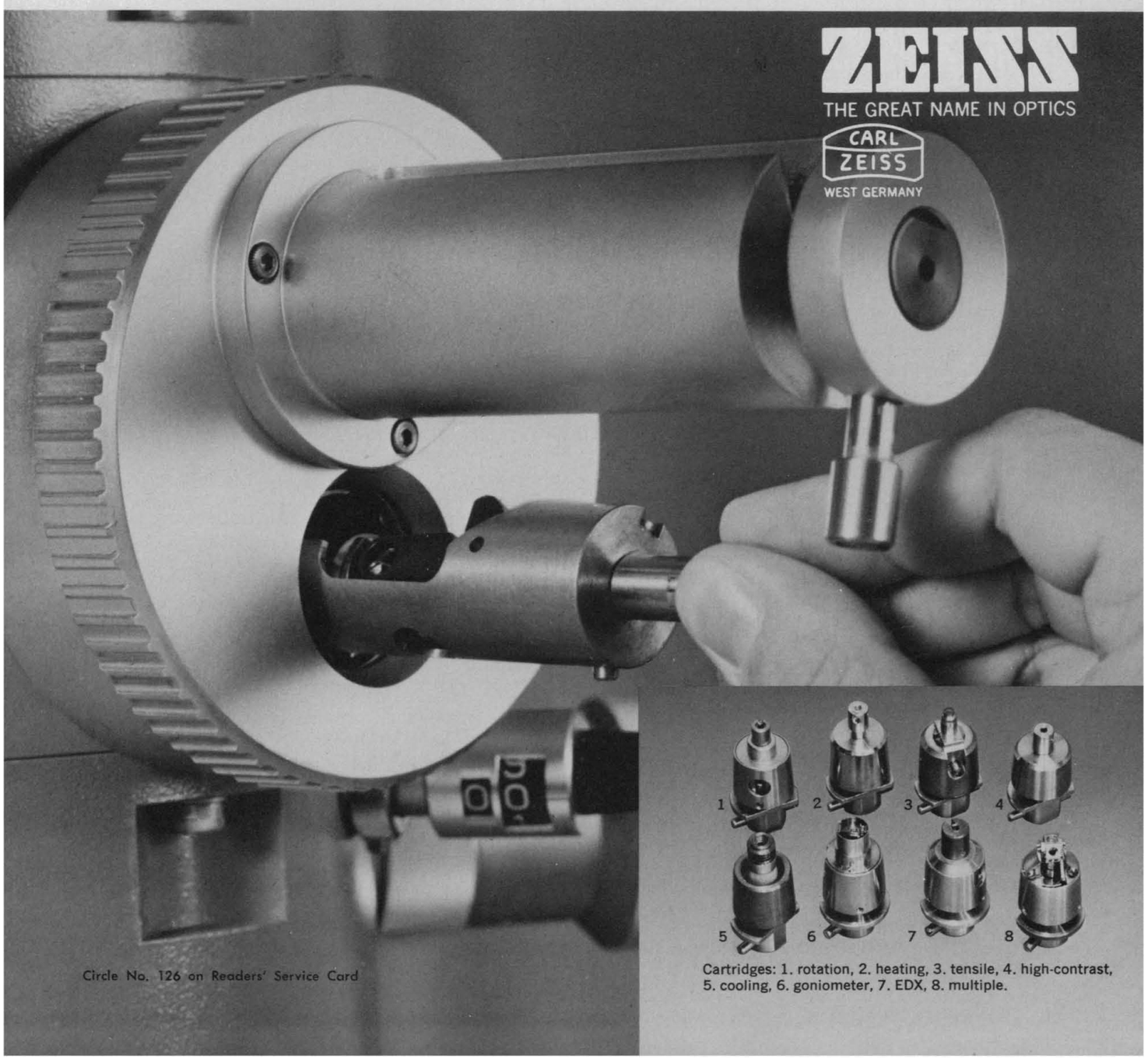

Cartridges: 1. rotation, 2. heating, 3. tensile, 4. high-contrast, 5. cooling, 6. goniometer, 7. EDX, 8. multiple.

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Four immuno techniques with one LKB Multiphor

Human serum analysed with LKB Multiphor and
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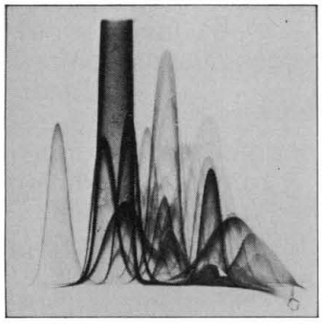
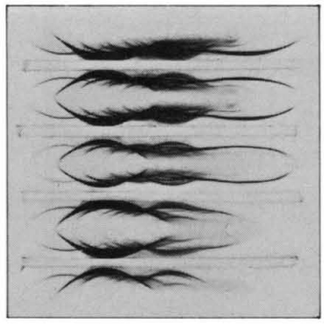
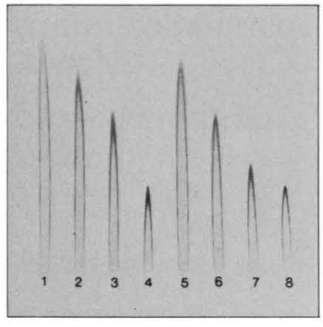


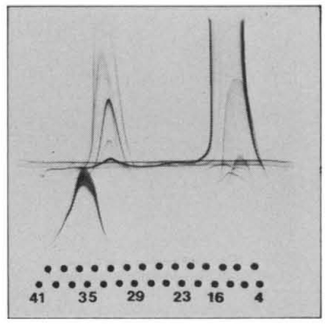
Crossed immunoelectrophoresis



Immunoelectrophoresis according to Grabar & Williams



"Laurell" rockets



Fused rocket immunoelectrophoresis with intermediate gel.

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The researcher will find immunoelectrophoresis useful in protein purification; e.g. the fused rocket technique for determining the number of components in a column chromatography peak. The clinician is able to perform both qualitative and quantitative assays of protein samples.

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Please contact us for more information about LKB equipment for immunoelectrophoresis: LKB 2117-301 Multiphor, 2117-201 Multiphor Electrophoresis Kit, 2117-401 Multiphor Immunoelectrophoresis Kit, and 2121 Power Supply.

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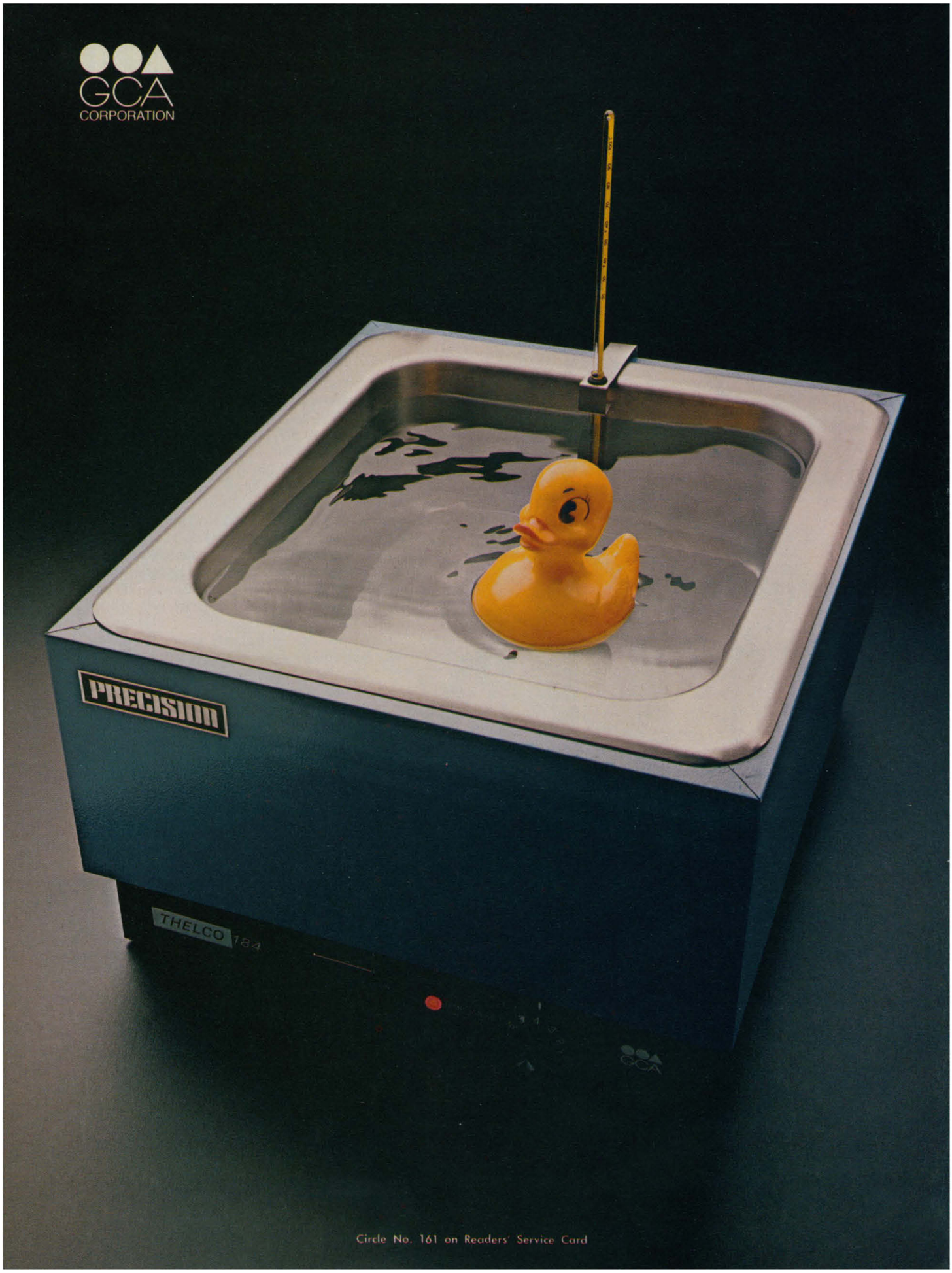

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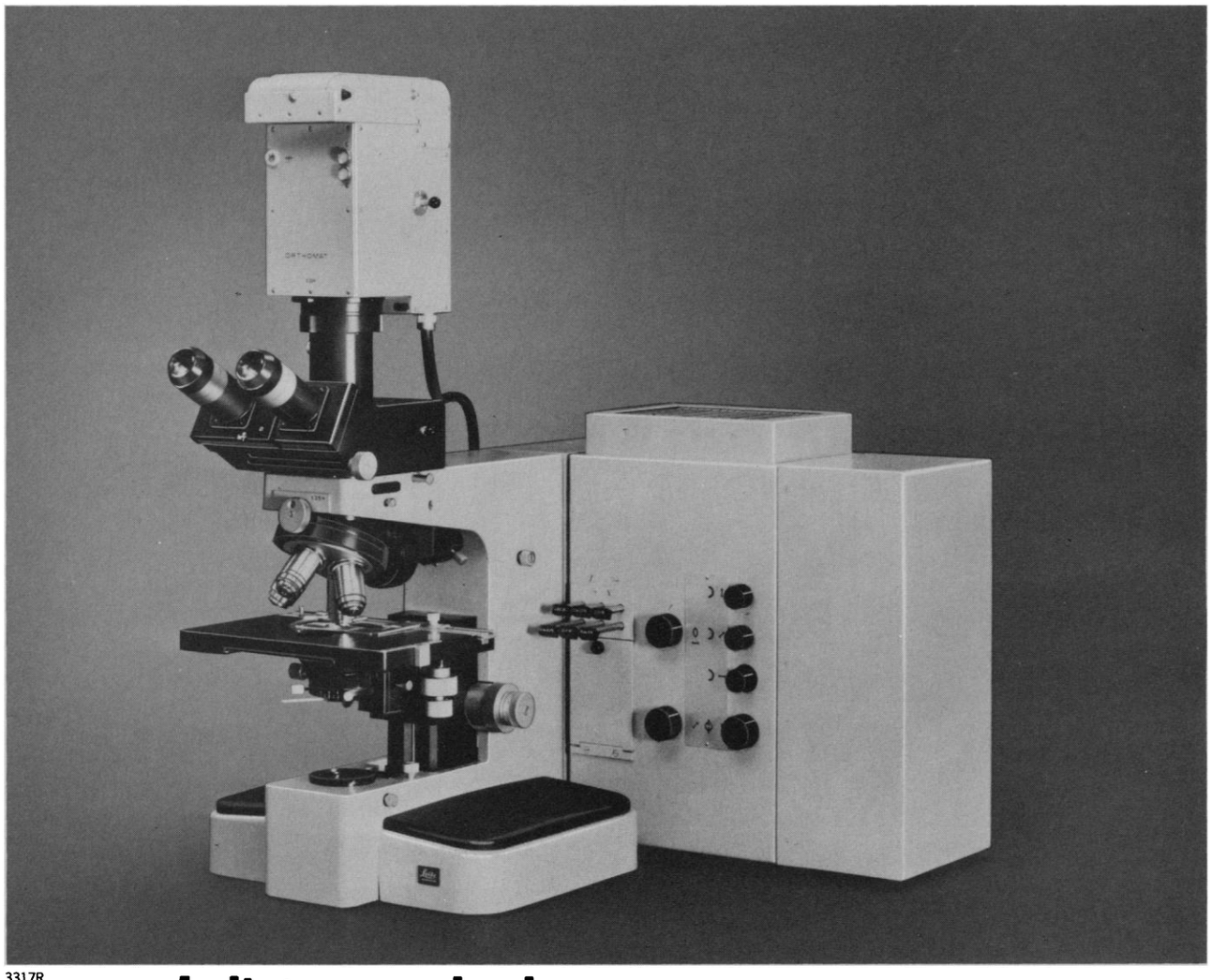

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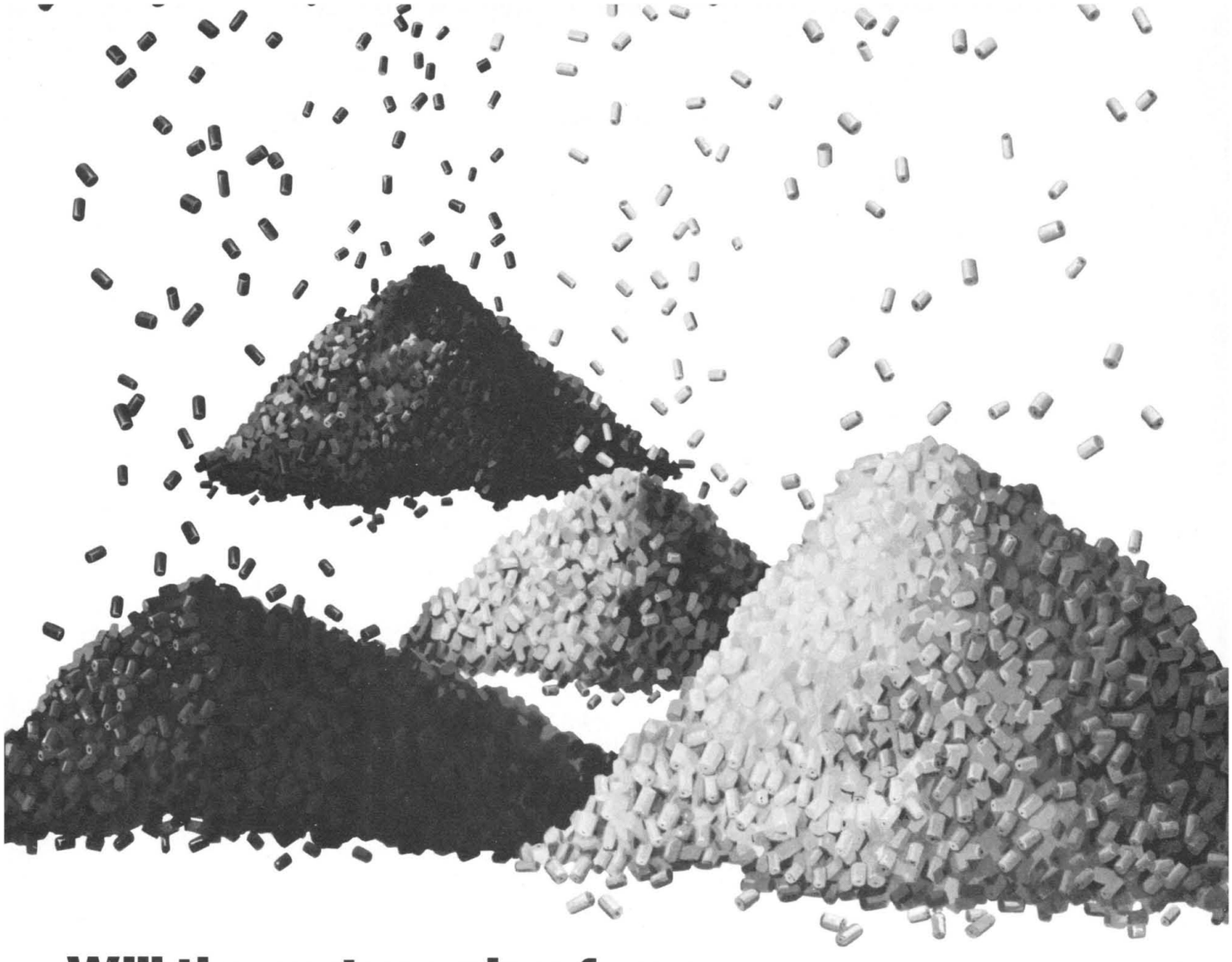

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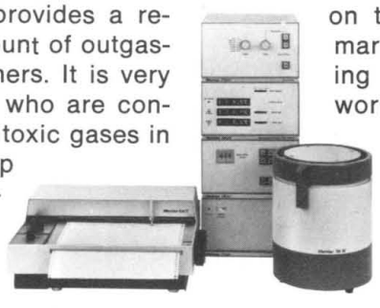

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LETTERS

The Feingold Diet

In her article "Food additives and hyperactivity" (Research News, 3 Feb., p. 516), Gina Bari Kolata infers that C. Keith Connors and his associates at the University of Pittsburgh studied the effect of the Feingold diet on a group of hyperactive children. She says Connors "has some evidence that the behavior of a small fraction of hyperactive children might improve with the diet. He finds that the behavior of most children, however, is not affected by it."

The Pittsburgh group did not conduct a study of the full Feingold diet. They did study the effects of artificial food dyes and artificial flavors on children. The Feingold diet eliminates artificial colors, artificial flavors, the additives BHA and BHT, and a number of natural salicylates (varying according to the sensitivity of the child). Feingold also recommends, in general, a diet that is high in protein and low in carbohydrates.

While members of the Feingold Association of the United States are gratified by the work of Connors and his associates, and even more so by the research of Herbert Levitan of the University of Maryland, we do not agree that a study of the effect of food dyes and flavors is synonymous with a test of the Feingold diet.

Parents of hyperactive children aren't waiting for the scientific imprimatur to be affixed to the diet 20 years from now. The Feingold Association, founded less than 3 years ago, now has about 20,000 families on the diet. They help each other through more than 100 local organizations. Our children are on the diet because it works.

MICHAEL MORRISON
Feingold Association of the United States, 1029 Jericho Turnpike, Smithtown, New York 11787

Retrolental Fibroplasia Study

A News and Comment article in *Science* (16 Dec. 1977, p. 1127) relays the opinion that the 1953–1954 Cooperative Study of Retrolental Fibroplasia is an example of a premature termination of a randomized controlled clinical trial. However, it should be made clear that the decision to end this study at the end of 1 year was made *before* the trial began and not as a result of findings during the trial.

The cooperative study was one of the first large-scale randomized clinical trials conducted in the United States. The details of the rather involved experimental design used in that study are spelled out in the published report (*1*). An unfortunate defect in the design of the trial limited the evidence concerning mortality.

The mischief caused by misconceptions concerning the clinical trial is felt in our courts of law. Conscientious physicians are being sued because they prescribed oxygen on the basis of the evidence available before the results of the cooperative study were announced (September 1954).

The resistance caused by a combination of social, political, and ethical forces, noted in the *Science* article, played a definite role in blocking further randomized clinical trials that might have answered the many unresolved questions about retrolental fibroplasia remaining at the end of the 1953–1954 trial. They are unresolved today.

WILLIAM A. SILVERMAN
90 La Cuesta Drive, Greenbrae, California 94904

References

1. V. E. Kinsey, *AMA Arch. Ophthamol.* **56**, 481 (1956).

NIH Grant Investigations: A Reply

The 25 November 1977 issue of *Science* contains an article entitled "Research management scandals provoke queries in Washington" (News and Comment, p. 804). One section, in which situations investigated by the Division of Management Survey and Review (DMSR) of the National Institutes of Health (NIH) are discussed, is headed by a paragraph stating, "Like any police file, many DMSR reports . . . make for chilling reading." Several excerpts from the file are reported, including the following:

> Another case involved two researchers at Brandeis University who got a grant from the National Institute of General Medical Sciences. Afterwards, DMSR alleged, the researchers departed for Israel, and apparently took with them some $6000 worth of equipment bought with NIGMS funds. The DMSR recommended that the cost of the equipment and part of their salaries be repaid to the government.

It is generally known by the biological community that my wife Raquel Rotman Sussman and I are the two researchers from Brandeis that left for Israel. We

consider the statement above and the semantically equivocal juxtapositions in the article to be harmful to our reputations and perhaps even unfair journalistic license.

At the time of our departure from Brandeis in June 1973, we were midway through the third year of a 5-year grant from NIH. I served as principal investigator and my wife as coprincipal investigator. Several months before our leave-taking, we corresponded with NIH to obtain information in order to arrange for the premature termination of the grant. We also provided the university with an itemized list of equipment and supplies left in our laboratory and obtained permission to take certain major items with us. Some time after our departure, NIH auditors arrived on campus in connection with a dispute involving the fiscal practices of another department. While there, they spot-checked other accounts including our own. Questions arose concerning several expenditures which could not be accounted for satisfactorily by the individuals present. We were not contacted to provide the needed information and explanations. In the absence of these, NIH disallowed the expenditures in question and the costs were absorbed by Brandeis. The items included:

1) One month's salary and fringe benefits to my wife and myself. (She received her total salary from the grant. I received a stipend representing 2/9ths of my annual salary.) We arrived in Israel on 15 June and began work shortly afterward. Between then and October, the start of our appointments at the Hebrew University, we did considerably more than 1 month's work which eventually culminated in eight significant publications, all bearing formal acknowledgments of NIH support.

2) Approximately $6000 for assorted small items of equipment ranging from a flash evaporator ($300) to a centrifuge rotor ($895). These were brought to Israel and used in the performance of the work described above. Each of the items was vitally necessary to our work, and the time required for their replacement would have resulted in delays of 4 to 6 months. More than a year later, after learning of the disallowance by NIH, we offered to ship the items back to Brandeis at our expense. Instead, Brandeis donated them to the Hebrew University.

3) The sum of $111 for shipping plus $21.50 for a telegram. We shipped a package to Israel by Air Freight containing frozen antiserums and enzyme preparations that had been collected during the tenure of the grant. The telegram was to warn a graduate student to pick up the package at the airport.

In assessing the ethical niceties of our actions, three considerations might prove revealing.

1) Before my departure, I was urged to accept a leave of absence rather than resign my position. Had I accepted the leave I could have retained a token laboratory at Brandeis and continued to use the grant funds, thereby subverting the NIH policy on support of overseas research.

2) Although my wife is an independent investigator of recognized international stature, her annual salary at the time of our departure was $12,000. This significant underpayment reflects our joint desire to convince the most skeptical examiner of the propriety of our professional relationship.

3) In 27 years of support from the Office of Naval Research, the National Science Foundation, and NIH, we have never overspent our grants, nor has any item of expense been disallowed before or after this experience.

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Decision-Making: What Basis?

Decision-making by the source rather than the force of an argument is universally condemned in retrospect but widely embraced in practice. The history of every human discipline teems with illustrations of extreme examples.

I have been advised by a professor of mathematics at a major university, himself a joint author of a high school geometry text, that his time is too valuable to waste on a brief manuscript on the foundations of geometry which I asked him to review. He said, in effect, that the foundations of geometry were worked over in the last half of the last century "by some pretty good mathematicians." He did not say, but he implied, that that work is inviolate and no useful contribution could come from someone not recognized in the field.

Were this an isolated incident, the cost would be minuscule. That it is widespread, nigh universal, is the real tragedy.

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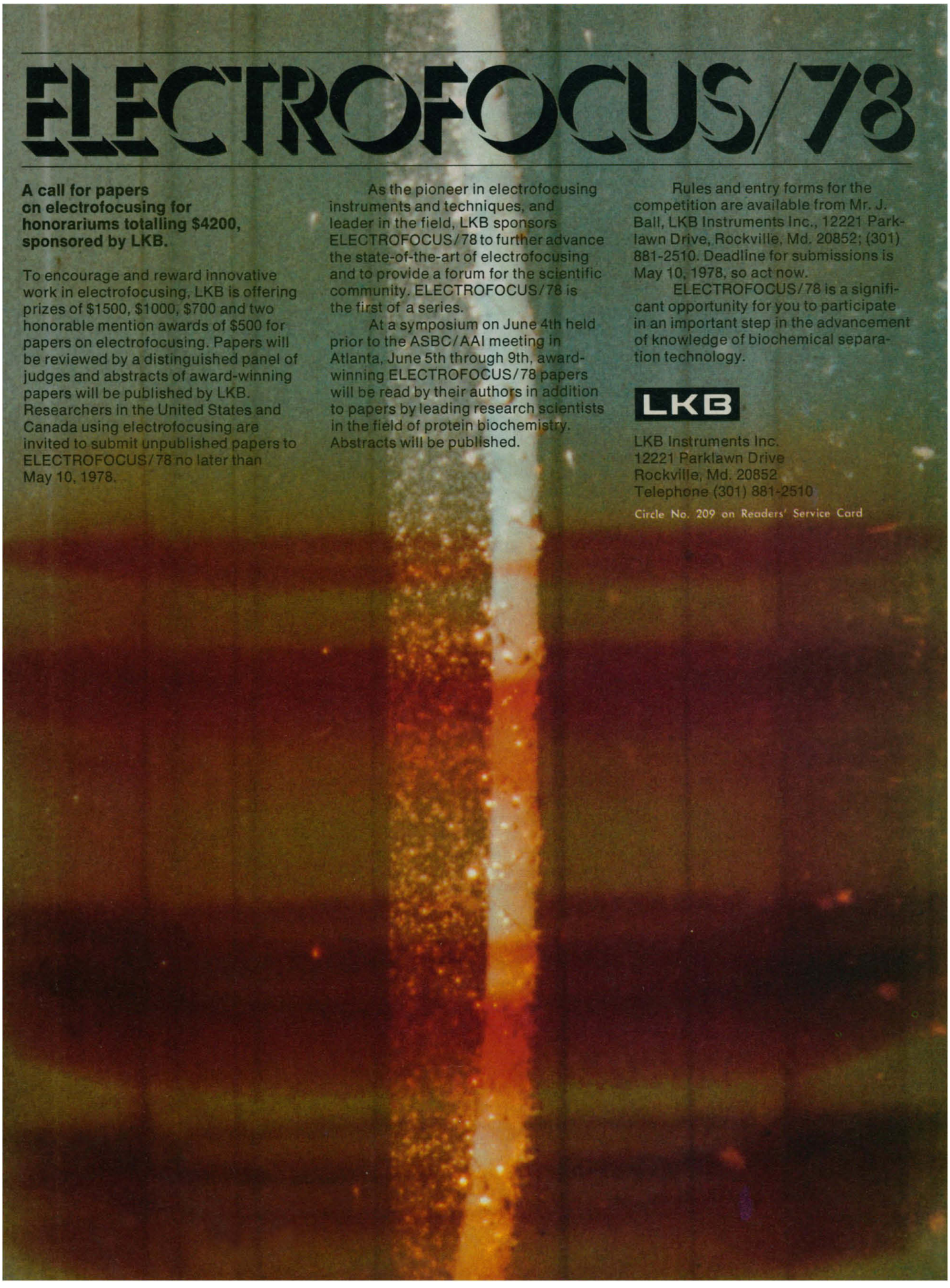

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24 February 1978, Volume 199, Number 4331 SCIENCE

Pedagogical Plainsmen

Truman Lee Kelley once labeled as "pedagogical plainsmen" those teachers and administrators who were so obsessed with norms and averages that they busily shoveled off peaks of excellence to make plains of uniformity. The plainsmen are still at work, trying now to reduce differences among colleges and universities to achieve a homogenized postsecondary system of education. Worthy objectives lie behind some of their efforts; college is not solely for the smartest, and special help is needed to overcome early disadvantages. Yet if the plainsmen succeed too well they will weaken the whole educational system. In intellectual affairs, as in athletics, a setter of high standards can improve the performance of all the rest. Why was it, Kevles* has asked, that in the late 1800's geology in the United States so exceeded physics in quality and usefulness? His answer: high standards set by the U.S. Geological Survey toned up geology throughout the land, while physics had no such standard setter. The Westinghouse Science Talent Search, the portable fellowships of the National Science Foundation, and other rigorously selective programs have encouraged nonwinners as well as winners; how often one hears a comment such as "I didn't win, but I sure learned a lot in trying."

But high standards are now called undemocratic and harmful. Thus some universities increase salaries across the board instead of on a merit basis; published ratings of the quality of graduate programs are disparaged; we are warned not to list universities in order of their research funds or the number of degrees conferred but to stick to a bland alphabetical listing; *elite* has become a dirty word; *higher education* has given way to *postsecondary education*; and *university* can now mean a large college.

Traditionally, colleges and universities of high quality have been valued both for themselves and as standard setters that contribute to the whole far out of proportion to their small number. This principle is still valid, but stating it is not enough, for resources are now often allocated on specific, segmental grounds, not on general principles. Federal funds have swung far in the direction of noncompetitive grants to students, while competitive support has dwindled. Peer review is accused of cronyism despite much evidence of its effectiveness in identifying research of quality. State legislatures find it easier to allocate funds to universities, colleges, and 2-year colleges by a numerical formula than to support each on the basis of its own distinctive requirements.

Champions of elite institutions are needed on all these and similar fronts. Fortunately, there is a currently popular concept that can reinforce their arguments: the values of diversity. We need different types of colleges, different kinds of achievement, different leagues of competition, and different types of rewards—all worthy of respect and support, but as diverse members of a larger community, neither to be treated alike nor to be expected to approach uniformity. Even within this diversity of institutions, however, champions of selective high quality will be needed to combat the plainsmen. They will be accused of making self-serving arguments, and will be called elitists. So be it.

Their arguments will be self-serving, but they will be nation-serving as well, as is the advocacy of high standards in other realms. And of course they will be elitists, in the older meaning of the word. That is the point, for what the plainsmen do not understand is that although their plains are sometimes shadowed, they are also nourished by the peaks.—DAEL WOLFLE, *University of Washington, Seattle 98195*

*Daniel J. Kevles, in *Nineteenth-Century American Science: A Reappraisal*, George H. Daniels, Ed. (Northwestern Univ. Press, Evanston, Ill., 1972), p. 142.

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Spectrophotometer for Metallic Elements

The IL 551 Video I model uses atomic absorption techniques for the determination of metallic elements. The device is microcomputer-equipped and displays the data on a cathode-ray tube. Data collection and analysis are activated by 12 pushbuttons for simplicity of operation. Once the operator selects the analytical conditions for the elements of interest, the instrument displays choices of mode, integration time, and so forth. Linearity of the analytical curve for any element may be corrected with up to five standards. Data may be routinely analyzed as well as collected and stored. Instrumentation Laboratory. Circle 712.

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The Third Arm is a flexible tool capable of gripping a variety of standard laboratory clamps for holding apparatus in selected positions. It can be mounted on a bench top, a wall, or another rack and when mounted it may be moved in several directions. It pivots, raises or lowers, and extends and retracts as selected. It has spring-counterbalanced articulation at three points so that the item grasped remains held at the desired angle. Pope Scientific. Circle 711.

Scanning Spectrometer

The RSS-C offers rapid (10^{-3} second) or slow (minutes) scanning of spectra. It features a monochromator with two optical elements, a low-inertia grating mounted on the shaft of a galvanometer and a spherical mirror. Although it is normally operated in the ultraviolet, visible, and near-infrared spectral range (200 to 900 nanometers), the device's all-reflective optics also permit infrared scanning. A microprocessor increases versatility and compatibility with other data-processing equipment. It operates in single- or double-beam modes, the latter for logarithmic ratio output. Derivative spectra may be recorded. Data is read on a recorder for slow scanning and on either a cathode-ray tube or a tape for rapid scanning. Harrick Scientific. Circle 713.

Liquid Chromatograph

The model 850 HPLC features a constant-volume, three-piston pump and microcomputer control of operation. The controller provides digital readout of such parameters as flow and pressure and allows the operator to select solvent gradients precisely. Any of the operating parameters may be altered at any time during analysis without interrupting the experiment. The controller also features diagnostic testing of critical components. Solvent delivery is controlled in both the gradient and isochratic modes. The pumping system has an internal volume of only 50 microliters per stroke and provides flow of from 0.2 to 9.9 cubic centimeters per minute. An oven in the modular column compartment keeps the solvent, columns, and samples at the same temperature. The compartment will accommodate up to six columns (up to 30 centimeters in total) in series. An organic vapor sensor alerts the operator to any leakage of solvent. The detector is sensitive to 0.002 AUFS plus or minus 1 percent noise. The filter photometer operates at six wavelengths from 254 to 546 nanometers. Solvents are mixed on the low-pressure side of the pump. DuPont Instruments. Circle 707.

Atomic Absorption Spectrophotometer

The AA 775 series are microprocessor-controlled, double-beam units. An eight-bit microprocessor collects and sorts photometric data and executes routines to correct for background and perform absorbance conversion. A rational-function algorithm is applied for optimum accuracy in calibration. Five standards are used for calibration. Samples are quantified by using the mean of several measurements made in rapid sequence. Even fast, transient peaks are quickly detected and their height and area are determined. Single-function keys on the control panel call up the routines desired by the operator. Varian Instrument Division. Circle 709.

Vibration-Isolation Tables

Vibration isolation tables prevent shock and vibration from affecting microscopes, ultramicrotomes, micromanipulators, hardness testers, balances, and other sensitive laboratory instruments. A combination of mass, elastomers, and air mounts removes up to 95 percent of such disturbances. Modular components enable the scientist to select a design compatible with space requirements. Table-top units will support up to 270 pounds of equipment, are 99 percent efficient at removing noise and vibration at 40 hertz and above, and have a fully loaded resonant frequency of 1.8 hertz. Nikon Instrument Division. Circle 708.

Literature

Research Equipment describes a line of apparatus for agitation, drying, and chemical reaction. Bench Scale Equipment. Circle 714.

Electrophoresis Purity Reagents includes materials for electrophoresis and isoelectric focusing techniques. Bio-Rad Laboratories. Circle 716.

Newly offered instrumentation, apparatus, and laboratory materials of interest to researchers in all disciplines in academic, industrial, and government organizations are featured in this space. Emphasis is given to purpose, chief characteristics, and availability of products and materials. Endorsement by *Science* or AAAS is not implied. Additional information may be obtained from the manufacturers or suppliers named by circling the appropriate number on the Readers' Service Card (on pages 842A and 906A) and placing it in the mailbox. Postage is free.

—RICHARD G. SOMMER

BOOKS RECEIVED

(*Continued from page 874*)

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Applications of Bifurcation Theory. Proceedings of a seminar, Madison, Wis., Oct. 1976. Paul H. Rabinowitz, Ed. Academic Press, New York, 1977. x, 390 pp., illus. $15.50. Publication No. 38 of the Mathematics Research Center, University of Wisconsin at Madison.

Applied Geomorphology. A Perspective of the Contribution of Geomorphology to Interdisciplinary Studies and Environmental Management. John R. Hails, Ed. Elsevier, New York, 1977. xvi, 418 pp., illus. Paper, $39.95.

Applied Salt-Rock Mechanics 1. The In-situ Behavior of Salt Rocks. C. A. Baar. Elsevier, New York, 1977. viii, 294 pp., illus. $38.95. Developments in Geotechnical Engineering 16A.

Approaches to the Study of International Organizations. Unesco, Paris, 1977 (U.S. distributor, Unipub, New York). 208 pp. Paper. *International Social Science Journal*, vol. 29, No. 1.

Atlas of Descriptive Histology. Edward J. Reith and Michael H. Ross. Harper and Row, New York, ed. 3, 1977. xiv, 288 pp. $14.95.

Beyond the Crisis. Norman Birnbaum, Ed. Oxford University Press, New York, 1977. xvi, 232 pp. Cloth, $11.95; paper, $5.95.

Biochemical Actions of Hormones. Vol. 4. Gerald Litwack, Ed. Academic Press, New York, 1977. xxxvi, 514 pp., illus. $37.50.

Biology as a Social Weapon. Papers from a symposium, Ann Arbor, Mich., Sept. 1975. The Ann Arbor Science for the People Editorial Collective. Burgess, Minneapolis, 1977. vi, 154 pp. Paper, $5.95.

Cocaine: 1977. Robert C. Petersen and Richard C. Stillman, Eds. National Institute on Drug Abuse, Rockville, Md., 1977 (available from the Superintendent of Documents, Washington, D.C.). viii, 224 pp. Paper, $3. NIDA Research Monograph No. 13.

Combinatorial Surveys. Proceedings of a conference, Egham, Surrey, England, July 1977. Peter J. Cameron, Ed. Academic Press, New York, 1977. viii, 226 pp. $13.65.

Computers and Their Societal Impact. Martin O. Holoien. Wiley, New York, 1977. xiv, 264 pp., illus. $10.95.

Control Mechanisms in Cell-Type Conversion in Newt Lens Regeneration. Tuneo Yamada. Karger, Basel, 1977. x, 126 pp., illus. $32.75. Monographs in Developmental Biology, vol. 13.

Corpus of Maya Hieroglyphic Inscriptions. Peabody Museum of Archaeology and Ethnology, Harvard University, Cambridge, Mass., 1977. Vol. 3, part 1. Ian Graham and Eric von Euw. 62 pp. Paper, $10. Vol. 4, part 1. Eric von Euw. 68 pp. Paper, $10.

A Course on the Application of Group Theory to Quantum Mechanics. Irene Verona Schensted. NEO Press, Peaks Island, Me., 1976. 342 pp. Cloth, $10; paper, $5.

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The Ecology and Evolution of Animal Behavior. Robert A. Wallace. Goodyear, Pacific Palisades, Calif., 1977. xi, 348 pp., illus. $15.95. Reprint of the 1973 edition.

Ecoscience. Population, Resources, Environment. Paul R. Ehrlich, Anne H. Ehrlich, and John P. Holdren. Freeman, San Francisco, 1977. xviii, 1052 pp., illus. Cloth, $39.95; paper, $19.95.

The Emergence of Professional Social Science. The American Social Science Association and the Nineteenth-Century Crisis of Authority. Thomas L. Haskell. University of Illinois Press, Urbana, 1977. xii, 276 pp. $12.

Environmental Effects on Crop Physiology. Proceedings of a symposium, Bristol, England, Apr. 1975. J. J. Landsberg and C. V. Cutting, Eds. Academic Press, New York, 1977. xviii, 388 pp., illus. $28.35.

ERG, VER and Psychophysics. Papers from a symposium, Louisville, Ky., May 1976. Theodore Lawwill, Ed. Junk, The Hague, 1977. viii, 404 pp., illus. Dfl. 120. Documenta Ophthalmologica Proceedings Series, vol. 13.

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The Evolving Continents. Brian F. Windley. Wiley, New York, 1977. xviii, 386 pp., illus. Cloth, $29.92; paper, $11.95.

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New York, ed. 2, 1977. xx, 690 pp., illus. $49.50.

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Marine Manganese Deposits. G. P. Glasby, Ed. Elsevier, New York, 1977. xii, 524 pp., illus. $49. Elsevier Oceanography Series, 15.

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