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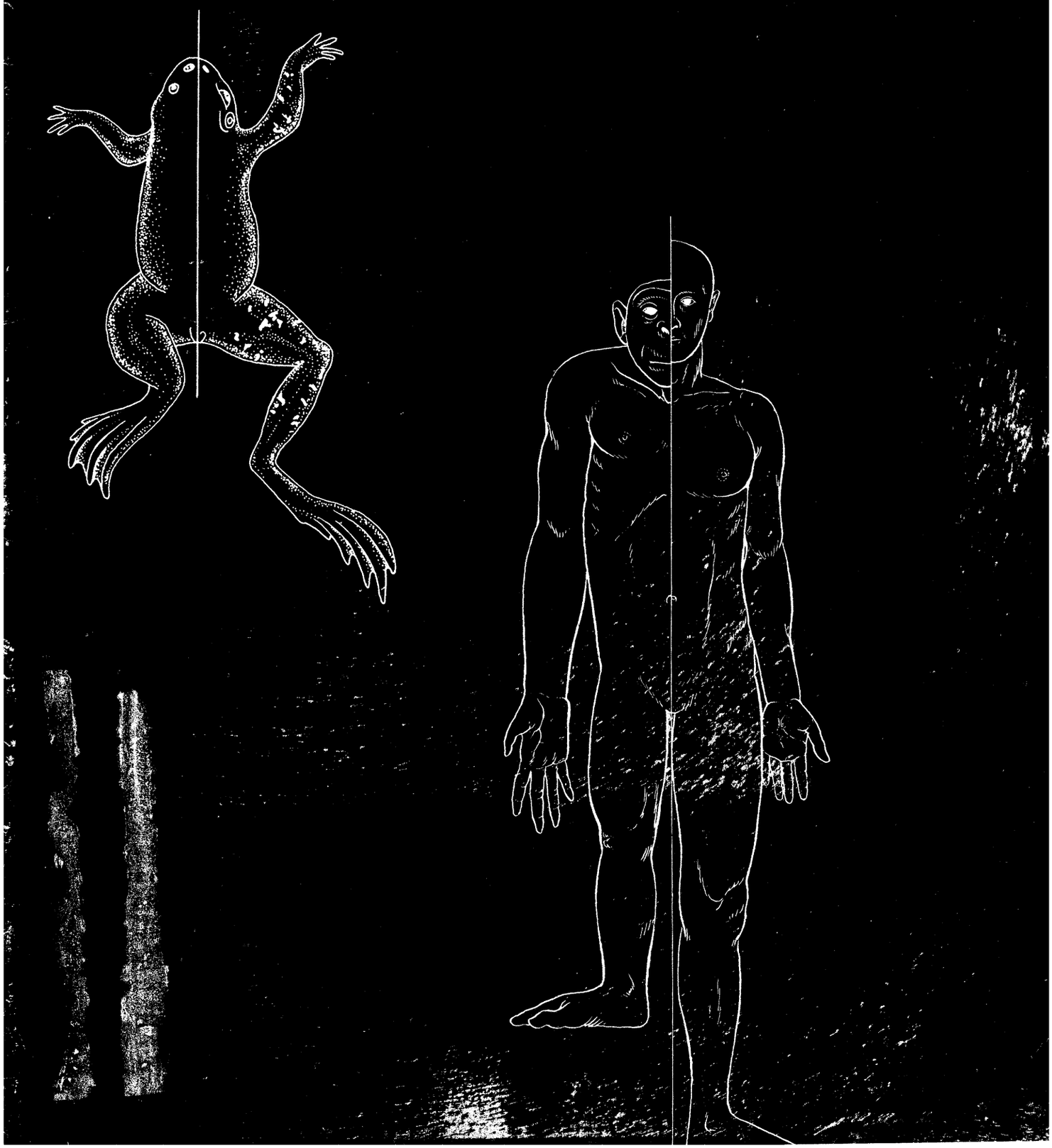


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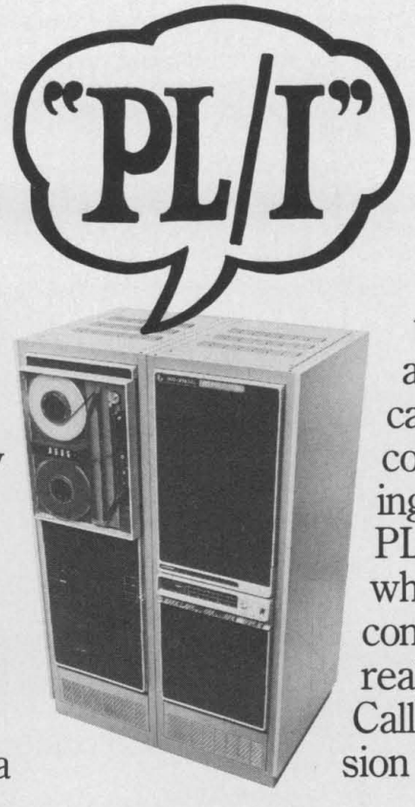


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# SCIENCE





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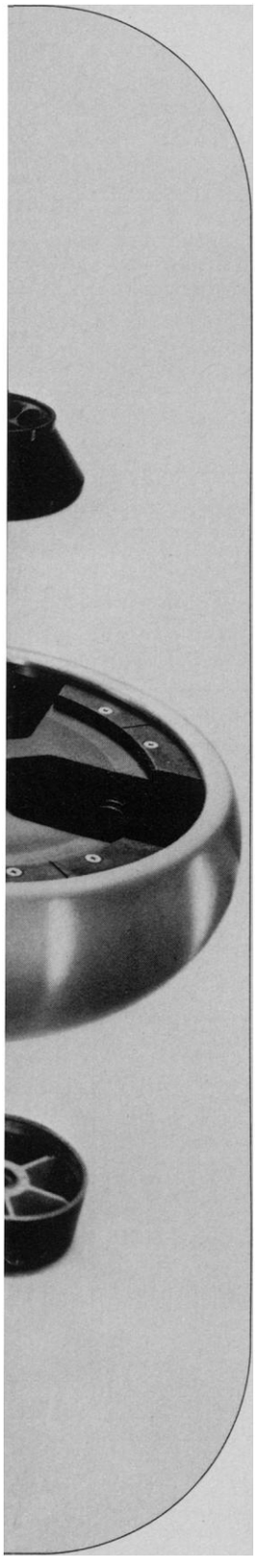
**COVER**

Comparison of body shapes. The half chimpanzee–half human drawing illustrates the morphological differences between ape and human. The half *Xenopus*–half *Rana* diagram illustrates the morphological differences between representatives of two different suborders of frogs. The ape-human difference is at least as large as that between the two frogs. This contrasts with the biochemical picture. Biochemically, the two frogs are at least 30 times further apart than humans are from apes. See page 209. [Diagram, S. L. Washburn, University of California, Berkeley]

# an evolutionary line:



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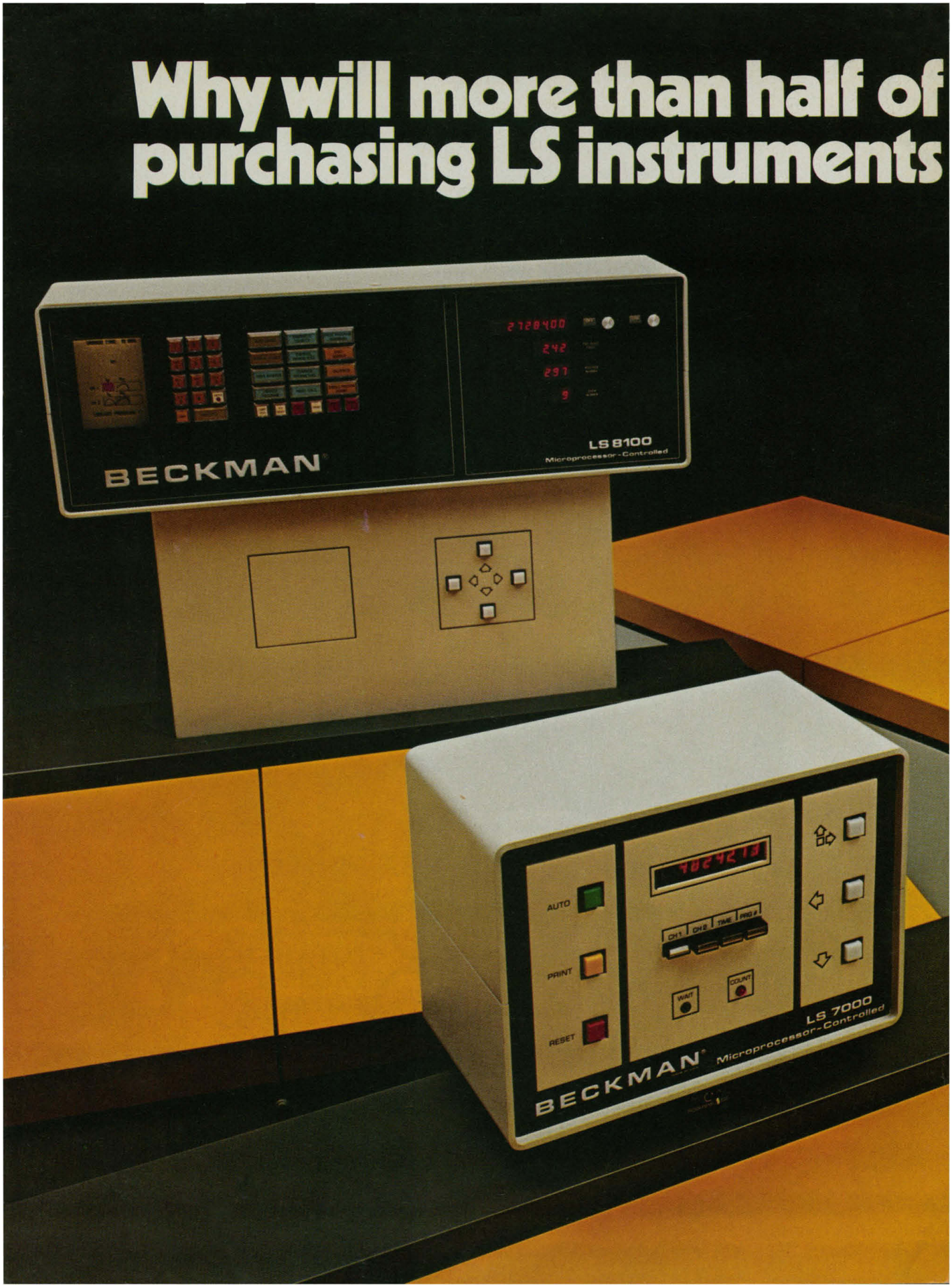

# all researchers select Beckman?


A decade of technical innovation dedicated to improving both the simplicity of instrument operation and data quality is the main reason.

For example, today's Beckman LS counters feature microprocessor control centers that blend true one-button operation for workhorse throughput, with on-line data reduction capability for a multiplicity of independent users.

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As you might expect, this genuine commitment to nuclear counting technology has also paid off for the user group with very high instrument reliability rates. While service, when necessary, has been fast, precise and readily available from a nationwide support network.

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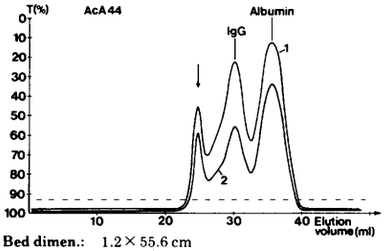
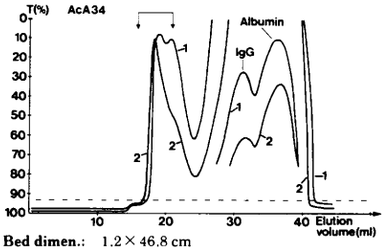
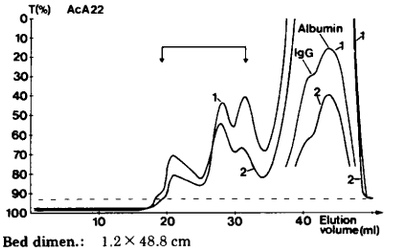



**Bed dimen.:** 1.2 × 55.6 cm
**Flow rate:** 5.0 cm/h
**UV-detection:** Curve 1, 280 nm T × 1 Curve 2, 254 nm T × 1




**Bed dimen.:** 1.2 × 46.8 cm
**Flow rate:** 5.0 cm/h
**UV-detection:** Curve 1, 280 nm T × 5 Curve 2, 254 nm T × 5




**Bed dimen.:** 1.2 × 48.8 cm
**Flow rate:** 2.6 cm/h
**UV-detection:** Curve 1, 280 nm T × 5 Curve 2, 254 nm T × 5

**Buffer:** 0.05M phosphate, pH 7.0, containing 0.171M NaCl and 0.02% $NaN_3$
**Sample:** 0.3 ml human serum (70 mg protein/ml)
**Uvicord III monitoring:** For AcA 44, 100—0% transmission (T); for AcA 34 and AcA 22, 100—80% T with automatic switching to 100—0% T

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| Ultrogel type | Effective fractionation range* |
|---|---|
| AcA 22 | 100,000 — 1,200.000 |
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*Globular proteins

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**20-Year Average Annual Costs* for $50,000 5-Year Renewable Term Policies**

| | Policies Issued To Men | | | Policies Issued To Women | | |
|---|---|---|---|---|---|---|
| | Issue age 25 | Issue age 35 | Issue age 45 | Issue age 25 | Issue age 35 | Issue age 45 |
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| Connecticut General | 223.00 | 378.50 | 816.50 | 204.00 | 313.00 | 673.00 |
| Equitable | 187.00 | 343.50 | 754.00 | 163.50 | 297.50 | 677.50 |
| John Hancock | 200.50 | 344.00 | 750.00 | 192.00 | 307.50 | 659.00 |
| Massachusetts Mutual | 196.00 | 337.50 | 737.00 | 184.50 | 313.00 | 683.00 |
| Metropolitan | 188.50 | 347.00 | 779.50 | 162.50 | 267.00 | 565.00 |
| New York Life | 189.00 | 337.50 | 751.00 | 171.00 | 281.00 | 602.00 |
| Northwestern Mutual | 163.00 | 300.00 | 684.00 | 147.00 | 264.00 | 592.00 |
| Prudential | 164.00 | 300.00 | 592.00 | 146.00 | 242.00 | 462.00 |
| Travelers | 200.50 | 360.50 | 820.00 | 182.00 | 281.00 | 603.00 |
| **Mean Cost for 10 Companies** | **192.75** | **340.05** | **749.80** | **176.25** | **286.70** | **616.10** |

*Based on 1977 premium rates and dividend scales, adjusted for interest (4%) to recognize the time value of money; dividends not guaranteed.

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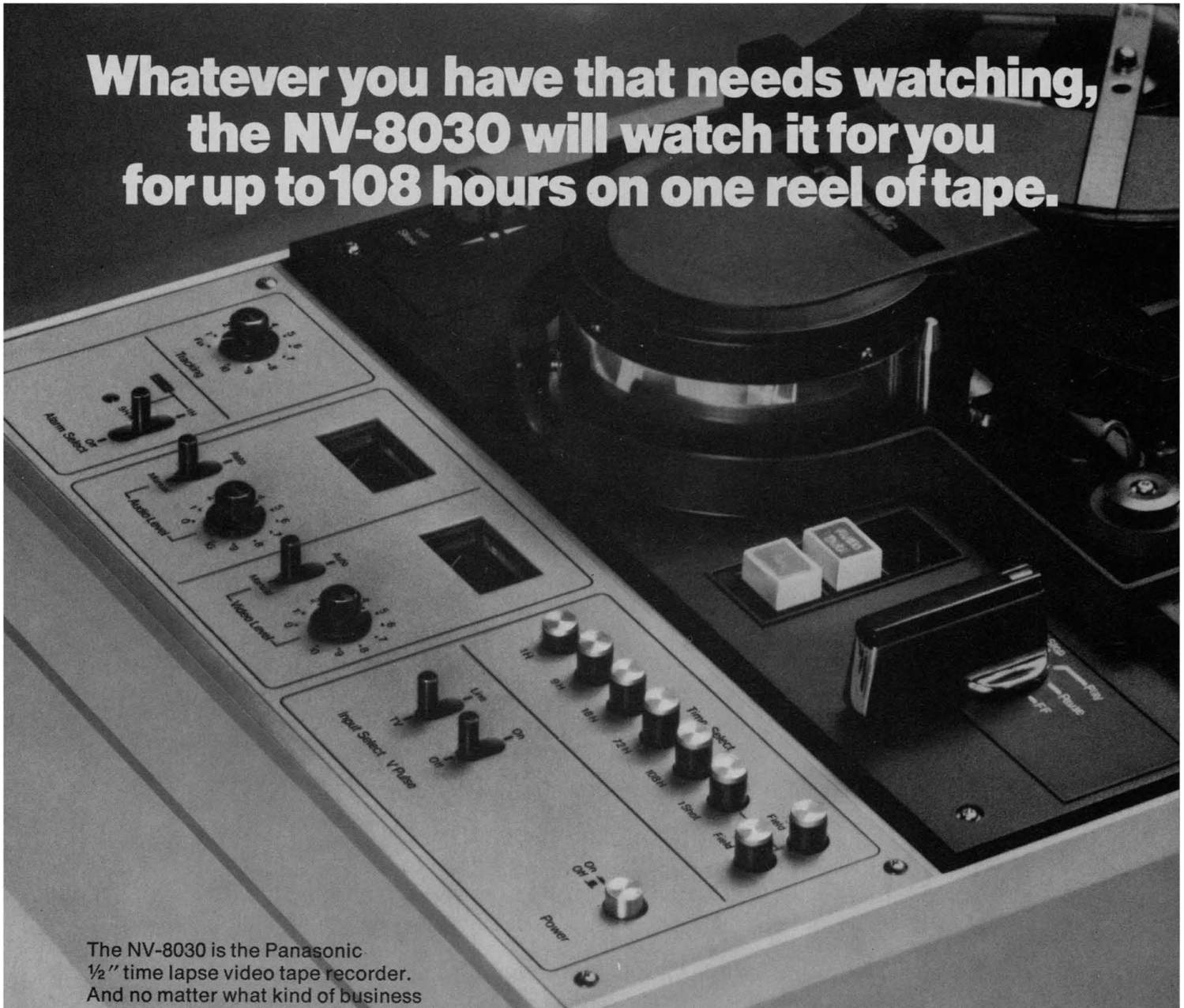


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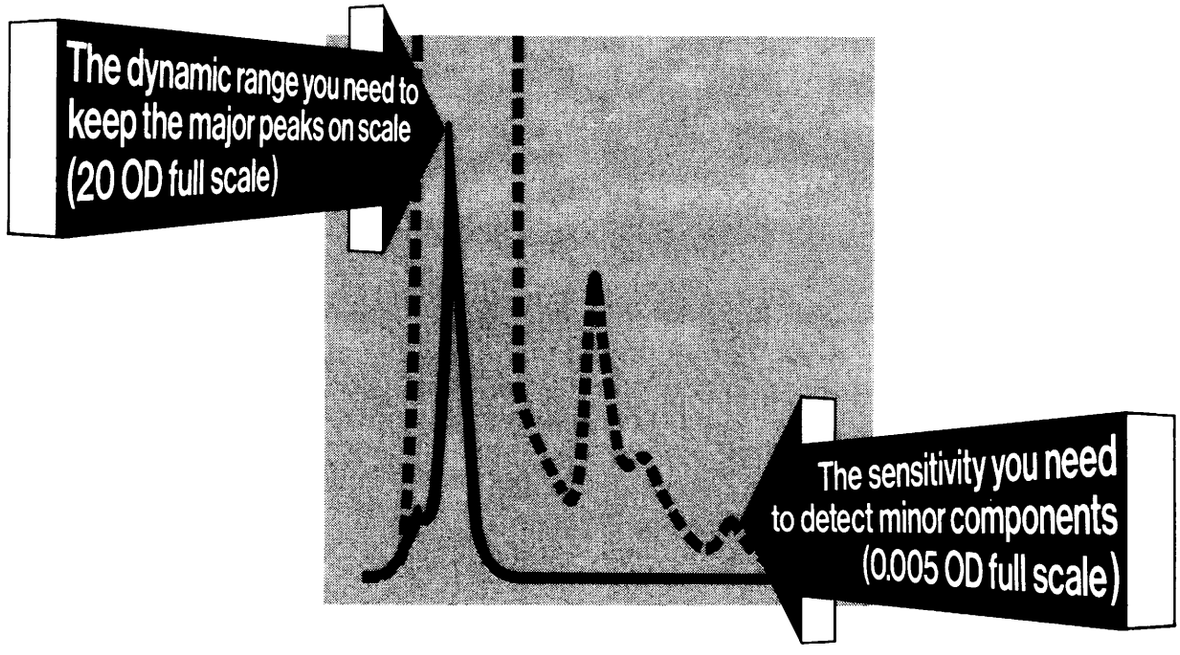


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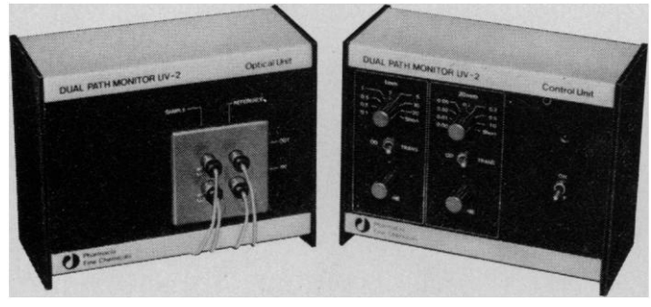


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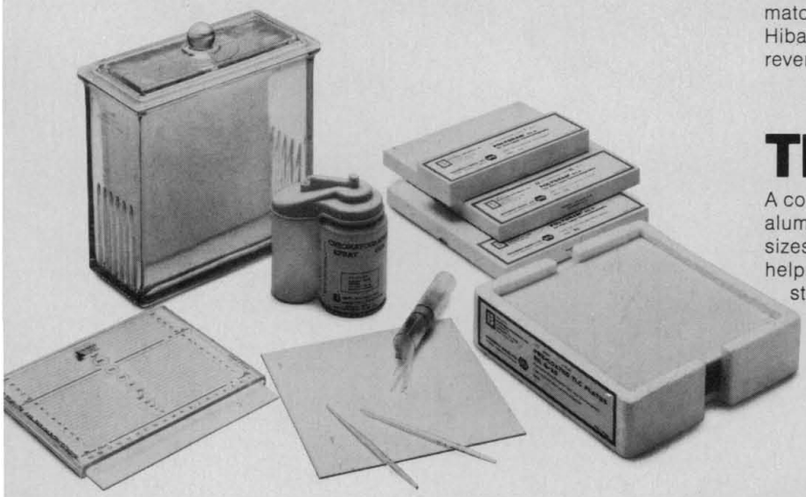

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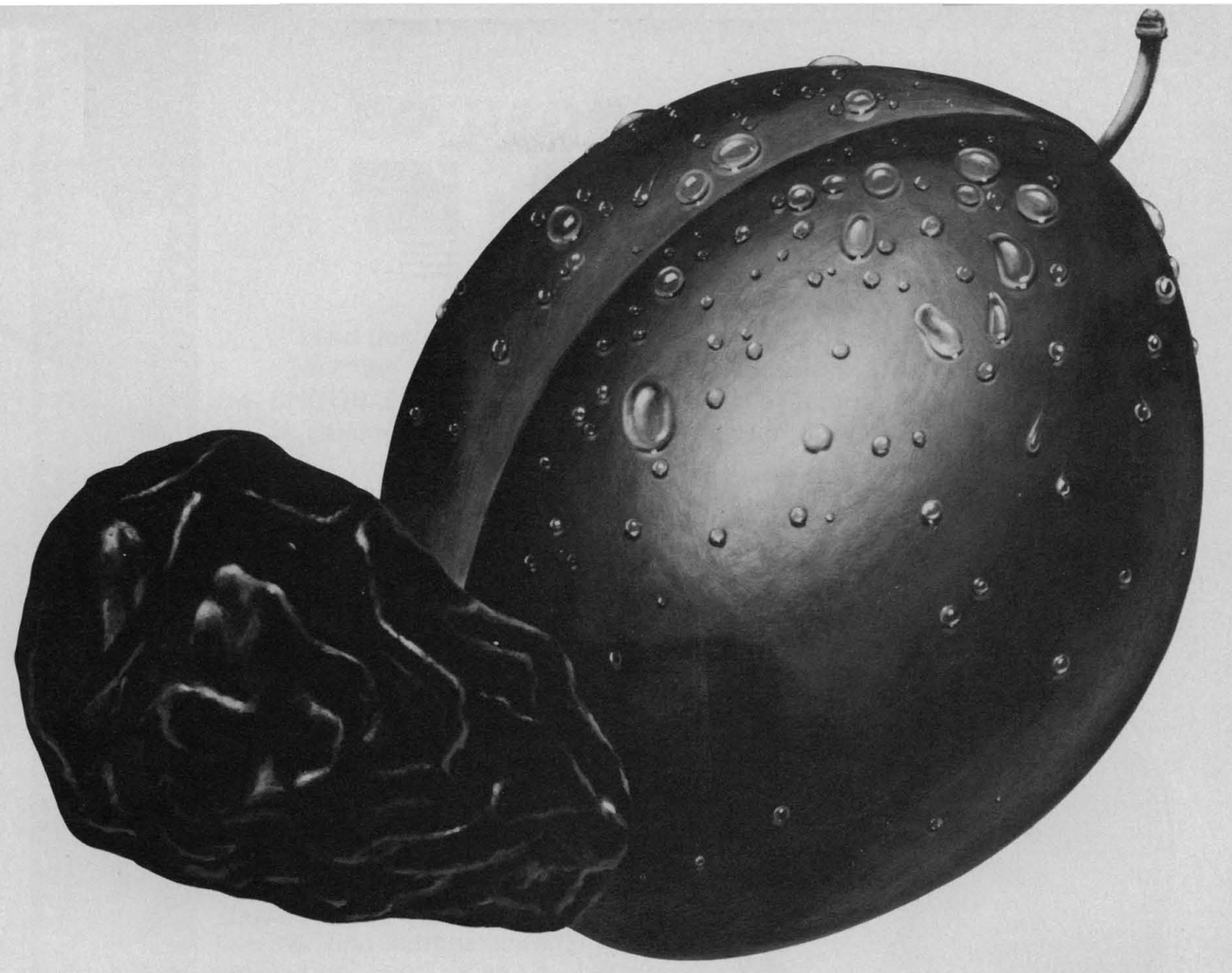

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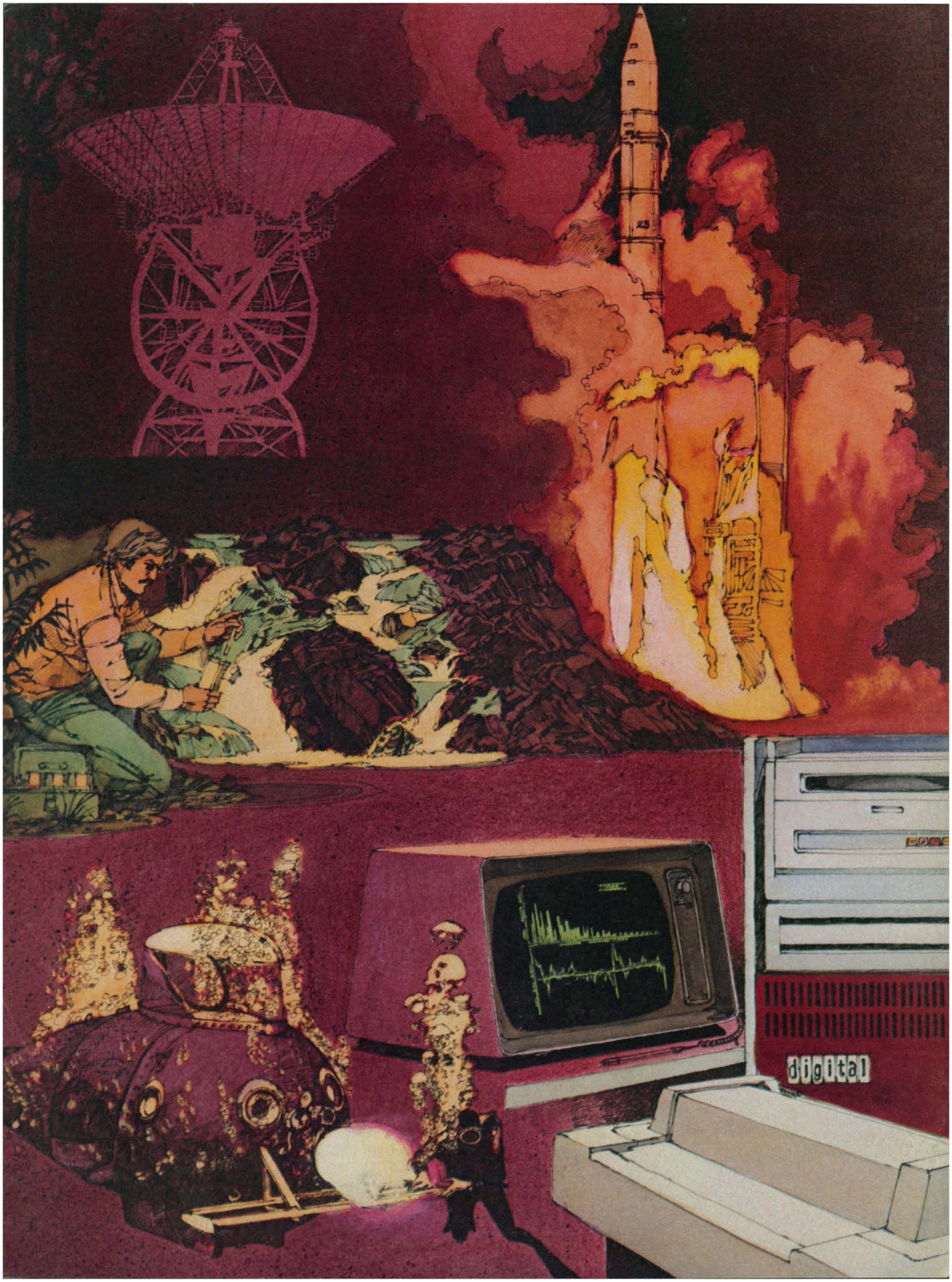
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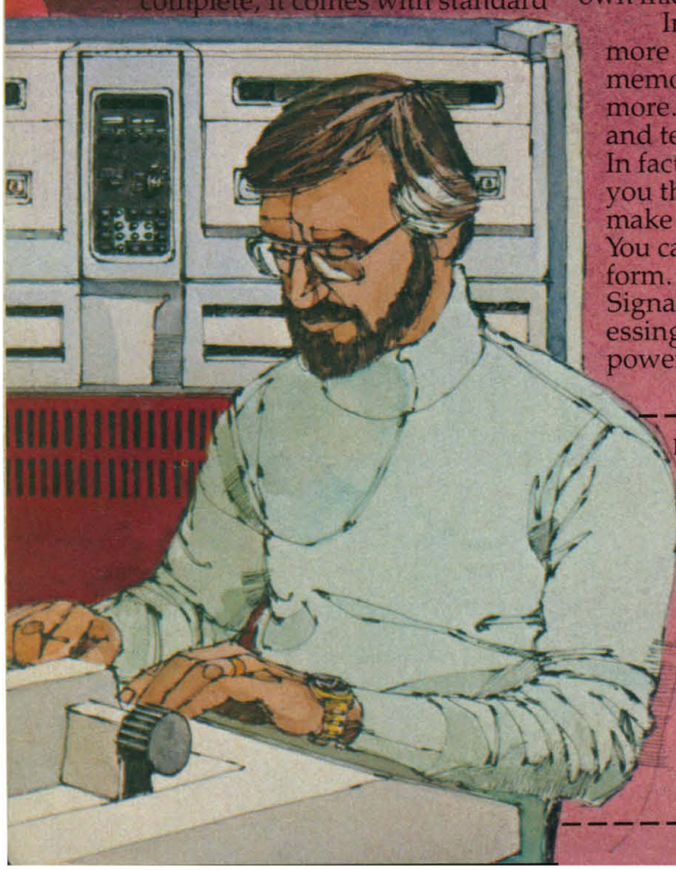

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## LETTERS

### The LDH Virus: An Interfering Biological Contaminant

The lactate dehydrogenase-elevating virus (LDH virus) is widely distributed in nature, having been found in wild and laboratory mice in North America, Australia, England, and Europe (*1–4*).

Of special relevance to the biological research community is the inconspicuous and thus unappreciated presence of this "silent" virus in many of the mouse-passaged materials used in biomedical research. Known contaminations have occurred in more than 100 transplantable mouse tumors, many of the oncogenic virus preparations, and other viral, bacterial, and *Bartonella*-like materials that have been or are being serially passed in mice (*1–4*).

We wish to call attention to the interpretative hazards associated with the wide variety of physiological alterations that this ubiquitous agent is capable of inducing in experimental mice. Some of the host alterations that are known to be associated with this viral infection have been erroneously ascribed to implanted tumors, oncogenic viruses, or to other experimentally imposed factors or conditions. Thus, certain immunological changes or manifestations observed in mice after tumor transplants or inoculation with other oncogenic materials may result, either largely or in part, from the concomitant LDH viral infection. The presence of the LDH virus is therefore capable of modifying and compromising otherwise carefully acquired biological data.

Following is an abridged list of host alterations and influences that are associated with the LDH viral infection and have caused or are capable of causing distortion, misinterpretation, or confusion of experimental data:

1) Immunological effects: lymphocyte trapping; thymus involution; changes in T cells, B cells, and macrophages; moderate splenomegalia and lymph node enlargement; enhancement or depression of humoral immunity; depression of cellular immunity; and production of virus-antibody complexes (*1–6*).

2) Endocrinological alterations: two- to tenfold increases in plasma corticosterone levels during the acute phase of viral infection (*1, 6, 7*).

3) Host enzyme changes: two- to hundredfold increases in plasma LDH and some other plasma enzymes, some of lifelong persistence (*1–4*).

4) Modifications of cancer therapy: potentiation of asparaginase and glutaminase effectiveness (*8*).

5) Alterations of host clearance capabilities: decreases in the rate of clearance of many naturally occurring or injected enzymes and other proteins and two- to tenfold increases in their half-life (*9*).

6) Changes in tumor behavior: increases in the incidence and growth rates of certain tumors and reduction of the percentage of regressions and of host survival times (*6, 10*).

7) Alterations in oncogenic viral expression: increases in tumor incidence; reduction of spontaneous regressions; increases in the number of spleen foci; and production of interferon (*6, 11*). Suppression of the incidence of mouse mammary tumor viruses or of tumors induced by the Moloney sarcoma virus under special conditions (*12*).

Investigators working with biological materials that have a high probability of carrying this silent virus are urged to establish its presence or absence. Editors and reviewers charged with monitoring the accuracy of published material should challenge submitted manuscripts that are appropriately suspect. As a minimum, the presence or absence of the virus in recipient mice and in mouse-passaged preparations should be clearly stated in all reports of research in which such materials were used.

However, to cope most effectively with this problem, it is also necessary to remove the passenger LDH virus, when present, from the classical, as well as newer, transplantable mouse tumors, from oncogenic and other virus preparations, and from miscellaneous mouse-passaged materials such as experimental murine pathogens and *Eperythrozoon coccoides*. Protective housing, quarantine procedures, and appropriate sanitary safeguards should also be used to prevent uncontrolled reinfection (*12, 13*).

The LDH virus produces a lifelong persisting viremia in infected animals. There is no known therapeutic means capable of eliminating the virus from the host. It is possible, however, by utilizing either special tissue culture techniques or appropriate heterotransplantation procedures to delete the LDH virus from specific tumors, mouse-passaged bacterial and viral materials, or other contaminated preparations, and then to transplant such virus-free materials back into "clean" mice (*2, 4*).

While it is possible for each laboratory to test and "purify" their own contaminated preparations, in practice this is time-consuming and requires special expertise and appropriate research facilities. Since LDH viral contamination will be a continuing problem for the foreseeable future because of recontaminations, individual solutions to the problem

are not consistent with realistic research economics. Such a special technical need of a significant section of the biological and biomedical research community could be more effectively accomplished by establishing a central laboratory within or sponsored by the National Institutes of Health or an appropriate institute or foundation. The establishment of such a center for both the detection and elimination of the virus would provide greater assurance that costly research studies in which mice are used would not be subject to misinterpretation as a consequence of the presence of an uncontrolled agent that alters immunological and other basic physiological parameters.

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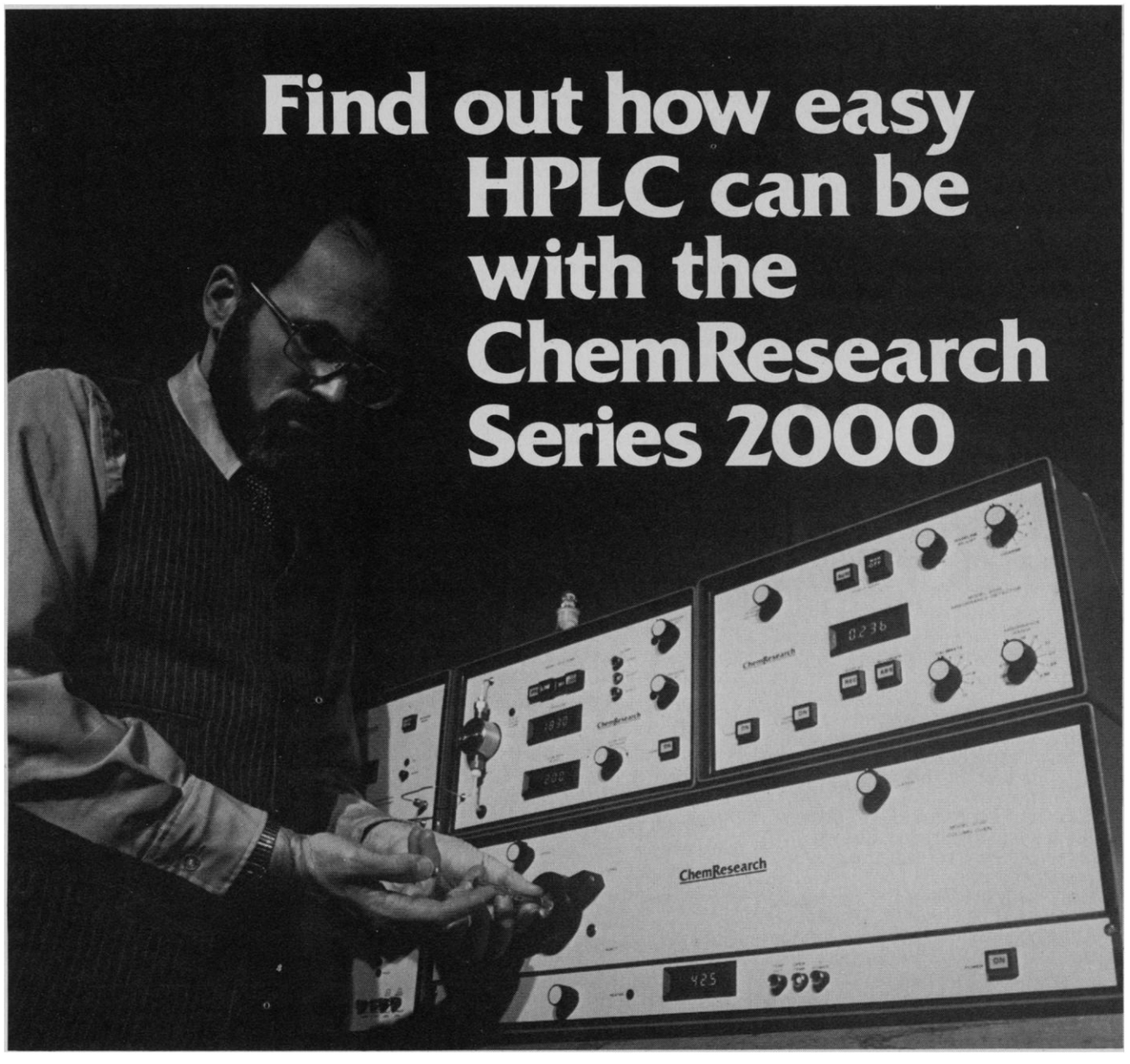
## Xeroxing Life

Barbara J. Culliton's excellent summary of the burgeoning controversy over human cloning (News and Comment, 24 Mar., p. 1314) suggests that once it is full-blown, this one will be dominated by arguments even more specious than those advanced (on both sides) by recombinant DNA research extremists. I am concerned here with only one of the possibilities: doubtless there will be opportunity in the future for ventilation of the others. At issue is the false notion, thus far undisputed by scientists responding to the press, that the product of a single successful nuclear transplantation is a "clone," that is, an *identical copy* (I avoid Jeremy Rifkin's plug for Xerox) of the individual donating the transplanted nucleus. My concern with this specific point is that, more than any other, the idea of mass production of identical persons is repugnant to the laity, perhaps because it is so obvious a departure from the organic way of doing things.

There is, however, no possibility in principle of making copies identical to an individual donor by the method being discussed. All animal ova studied so far, including those of mammals, contain a population of "maternal" messenger RNA molecules, laid down in the egg cytoplasm during oogenesis, and functioning in protein synthesis during development proper (*1*, *2*). Protein synthesis is indispensable for development, and a

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very large fraction of it—perhaps all in some species—is directed during the critical early stages by maternal RNA templates. The maternal messages are not genes, to be sure, but they are immediate products of genes, and they carry an enormous amount of genetic information. A conservative average might be the equivalent of 10,000 structural genes. The DNA from which these templates are copies is that of the *mother's* genome, and in the particular cases most likely to be of interest here, it is specifically DNA of the oocyte that is transcribed into RNA during the period of growth in the ovary (*2*, *3*).

The force of this is that an ovum is *not* a genetic tabula rasa; it is not the indifferent branch upon which a foreign shoot is grafted, nor yet the single somatic plant cell induced by a surrogate ovular fluid to produce an entire plantlet. The animal egg is a highly specialized and comparatively huge cell that contains not only a nuclear genome but also a complex (approximately $10^7$ nucleotides) derivative genome in the form of very stable messenger RNA, the function of which is to direct the protein synthesis by which divergences of cell type, central to morphogenesis, eventually appear (*3*). This derivative genetic information is specifically the mother's, *not* the father's nor, obviously, that of a donor cell selected in the laboratory.

It is still too early to say what identifiable features of the adult phenotype are regularly the unique products of maternal messages, but it is certain that they are not trivial features (*2*); in addition to the universal processes of cleavage, germ-layer formation, and morphogenetic movements in early development, there are certain to be maternally determined external adult characteristics, for example, the equivalent of left- versus right-handed spiraling in some molluskan shells. The mother's genes therefore make in oogenesis a critical and individual contribution to the outcome of animal development, and must do so even if the zygotic nucleus is removed from the fertilized egg.

There is therefore no possibility that a *literal* copy of the donor individual can be produced by the insertion of a somatic nucleus into recipient cytoplasm of a conveniently available egg. A roughly similar individual, yes; but a carbon copy, no. Only the nuclear genes are likely to be pretty accurate copies of the transplanted set. Yet it will be, I predict, the symbolic and emotional content of the carbon copy idea that most excites the popular imagination.

None of this is meant to cast doubt upon the possibility nor the inherent interest of animal cloning. There are other methods than the one about to be sprung on an unsuspecting world by Rorvik's *oeuvre*. Some of those can work in principle, but nobody has come close to succeeding with them, and there isn't much serious effort anyway. None of the alternatives has been mentioned in the press as yet. There are also variations of the nuclear insertion method, involving more than one generation of recipients, that can work in principle, but they are nearly as remote in practical terms. It takes exquisite skill and knowing how to deal with a preponderance of failures to apply such methods even to amphibian eggs. The mammalian egg is an order of magnitude smaller and more fastidious about its environment; its development is an order of magnitude more complex, and each generation requires gestation in utero.

We have, therefore, a long way to go. It is, however, a way that should not be blocked nor impeded by hysterical appeals to Stop Xeroxing People. Besides, the Xerox Corporation is having enough trouble as it is with its common stock.

PAUL R. GROSS

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## Geological Survey Director

Deborah Shapley (News and Comment, 10 Mar., p. 1054) has cast an unwarranted slur on the selection of Henry W. Menard as Director of the U.S. Geological Survey.

The headline of her article ("Old boy system produces Geologic Survey chief") implies that Menard was selected by the clandestine pick-up-the-phone-and-call-old-friends method of filling unadvertised positions that is so rightly decried today for shutting out qualified candidates.

Nothing in the article supports this implication. Menard is described as being "one of the boys," and it is noted that his name was not on the original list of five candidates. But isn't there a difference between being one of the boys and being selected for a position through an unjust old-boy network?

DAVID MCGEARY

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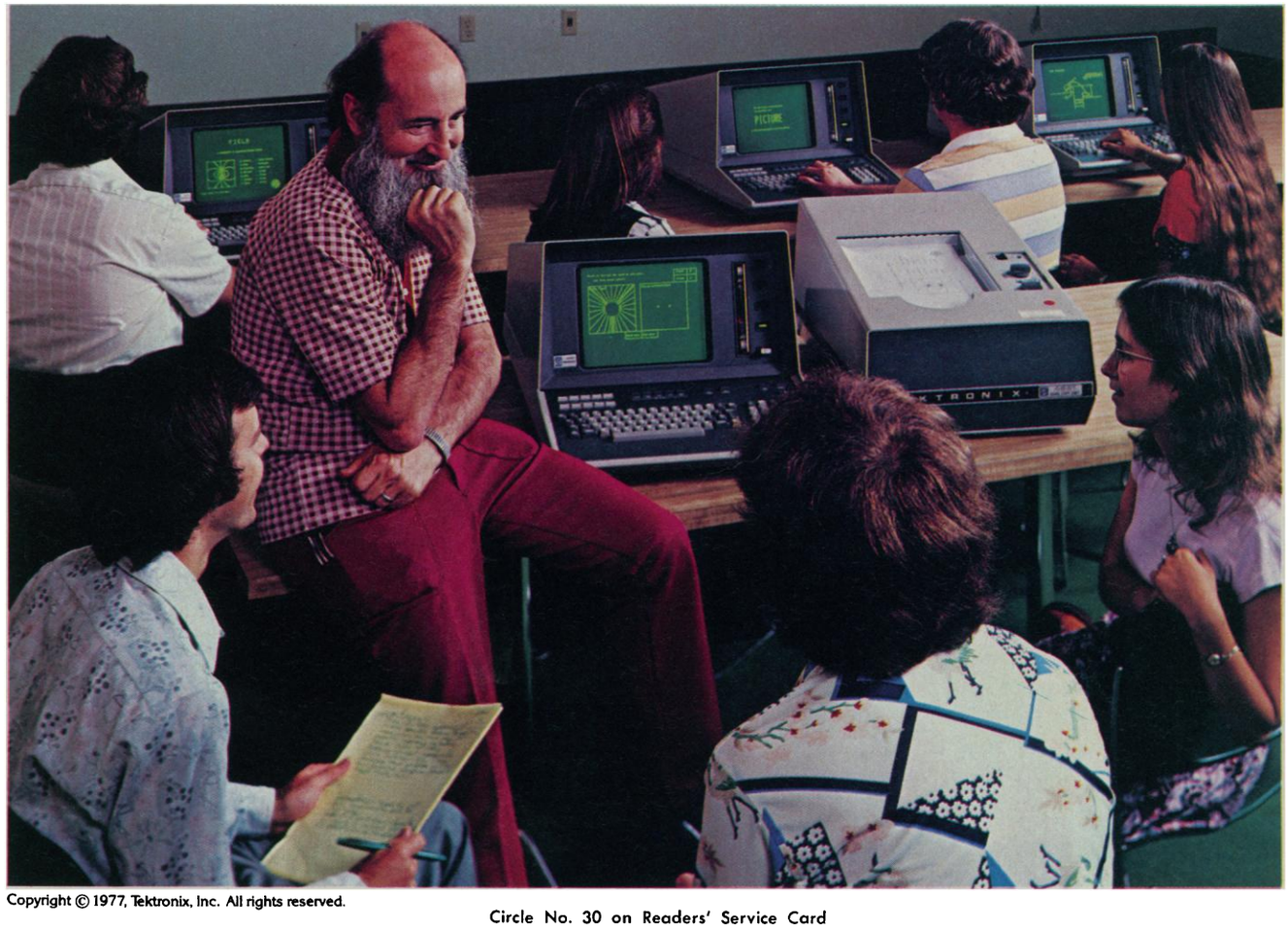




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14 April 1978, Volume 200, Number 4338 **SCIENCE**



# Energy and Development

The United Nations Conference on Science and Technology for Development to be held in Vienna in September 1979 could be an important constructive event. Many observers, however, fear that it will be just another confrontation of politicians from developed and less developed countries. Transfer of science and technology cannot be accomplished by the interaction of politicians or by gifts of black boxes or tons of blueprints—a prerequisite is human interaction at an expert level.

The organizers of the U.N. conference might well draw lessons from a symposium entitled "Energy and Development in the Americas," held from 13 to 17 March near Santos, Brazil.* Participants came from 16 countries and included about 110 scientists, engineers, and government representatives. They brought to the meeting different backgrounds of knowledge and experience, and found mutual pleasure and benefit in friendly interchanges. Topics covered included nuclear energy, oil, oil shale, coal, synthetic fuels, hydropower, windmills, hydrogen, solar energy, biomass, efficient use of energy, and energy for rural peoples. The participants shared the belief that the days of cheap oil are over and the conviction that each country must survey its own energy resources and move toward an energy independence based on indigenous supplies.

For Latin America in general, this means an emphasis on solar energy, biomass, and the development of large hydropower potentials. Venezuela has a great oil resource in its Orinoco tar sands; Brazil, oil shale; Colombia, substantial coal reserves; and Mexico, newly discovered oil; but the region as a whole is lacking in fossil fuels.

A problem much on the minds of participants was the continuing crowding into cities of the peoples of Latin America. There was a search for a means of slowing this trend by making rural life more attractive. Ways of creating cheap, small, practical energy sources were discussed. A problem of the cities is to provide electricity. Today, Argentina, Brazil, and Mexico are proceeding with nuclear power plants. Some of their neighbors are considering following this path.

From the standpoint of energy research programs, the United States is clearly the leader in terms of quantity and scope. This country is also becoming expert at building "demonstration plants." But with respect to converting research into production facilities that make a difference to the country's energy supply, the United States lags.

Brazilians are moving ahead with the production of alcohol for motor fuel and of charcoal from eucalyptus trees for steel mills. The use of palm oil to supplement diesel fuel is on the horizon, and the development of hydropower is continuing.

Two speakers from outside the Western Hemisphere provided additional perspectives. The French are proceeding with the operation of a nuclear reprocessing plant and with practical means of disposing of nuclear wastes. They have developed and are implementing long-range plans for their energy future. If one takes into account the skimpy resources of the Indian subcontinent, the United States is put to shame by the Indians. They are building a large number of biomass converters to produce methane from cow manure. The heating value of the methane is five times that of the cow dung. Sludge from the digesters makes excellent fertilizer.

This international meeting, sponsored jointly by the Brazilian Society for the Progress of Science and Interciencia, was organized in less than 6 months. In the year and a half remaining before the Vienna meeting, the United Nations still has time to create sessions and an atmosphere in which significant interchange can occur.—PHILIP H. ABELSON

*The Proceedings of the Interciencia—SBPC Symposium, "Energy and Development in the Americas," including 35 presentations, will be published in July 1978 by the Sociedade Brasileira para O Progresso da Ciencia, Caixa Postal 11008, 01000 São Paulo, S.P., Brazil. Reports and recommendations of the five workshops of the symposium will be published in the May-June issue of *Interciencia*, available at $2.50 (postpaid) from Interciencia, Apartado 51842, Caracas 105, Venezuela.

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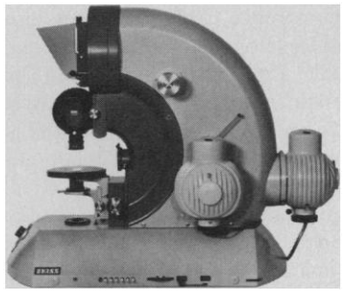

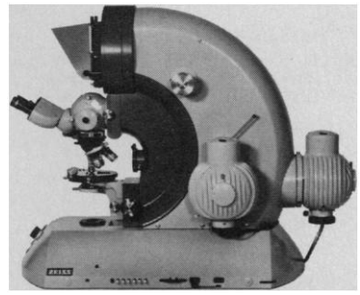

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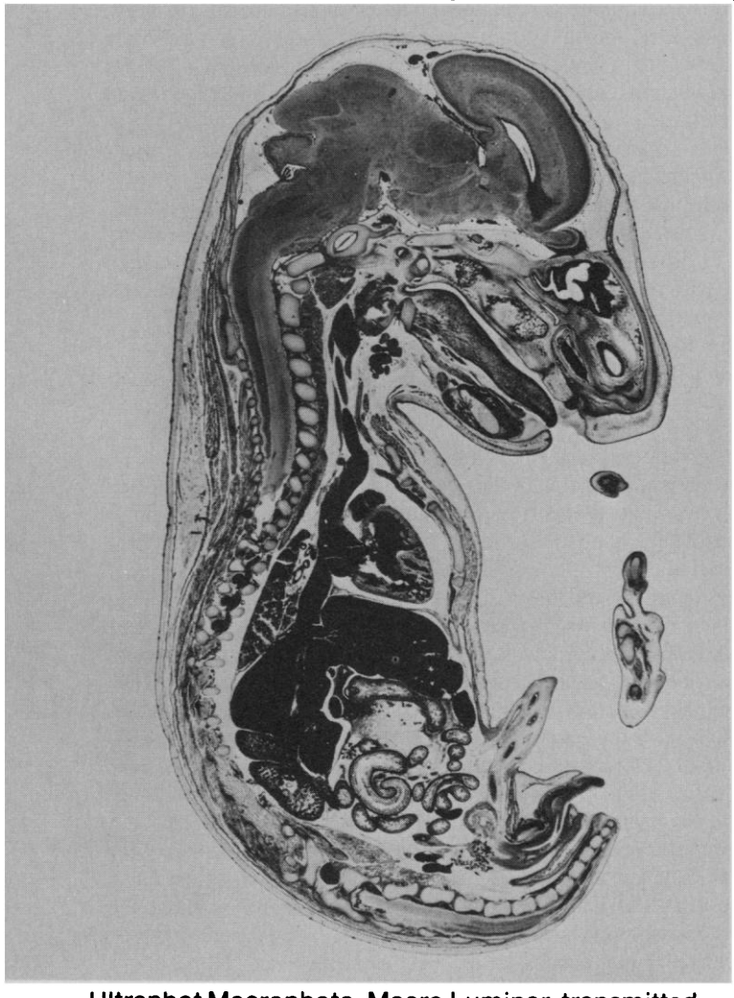

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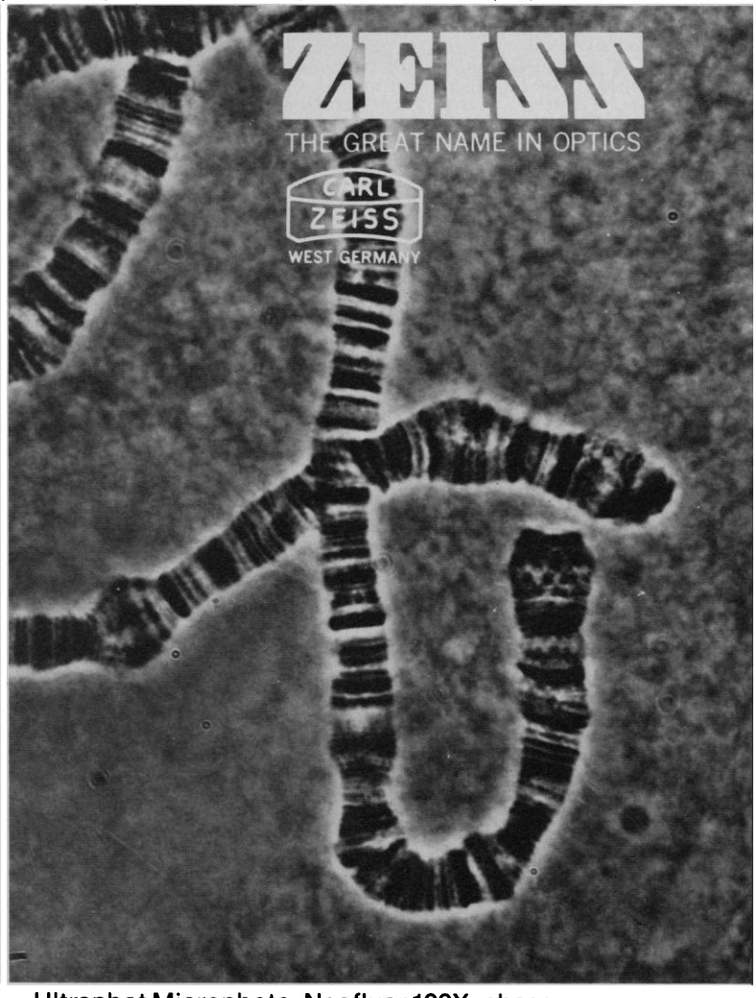


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### Research Microscope

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### Dish for Tissue Culture

The Petriperm dish has a bottom constructed from a plastic foil. The foil, 25 micrometers thick, may be permeated by gases. Cells grow on this hydrophilic surface at the boundary of liquid and gas phases. Because the liquid medium's action as a diffusion barrier is circumvented, any depth of medium may be used. Oxygen supply is optimum, even in rapidly growing cultures and more nutrient may be added in the form of more medium. The foil facilitates transmittance of light, even below 300 nanometers. Heraeus. Circle 706.

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The oscillating ball flowmeter electronically measures ultra-low flow rates. A flow transducer consists of a vertically positioned borosilicate glass tube containing a magnetic ball; the tube has an electromagnet at the top and a light source and optical sensor at the bottom. At zero flow the ball is made to oscillate in the tube at 20 hertz; as the rate of flow increases, the frequency of oscillation is reduced. The signal related to the rate of flow detected by the transducer is processed and the rate of flow is displayed. Lab-Crest Scientific Glass. Circle 703.

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### Literature

*Computing Quantitative Infrared Analyzer* describes the Miran 80 analyzer for solid, liquid, or gas samples. Foxboro/Wilks. Circle 710.

*Science Tools* has a special issue devoted to whole-body autoradiography that details techniques, instrumentation, and references. LKB-Produkter. Circle 711.

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*Gel-Filled Electrode* describes the GX combination electrode that features a lifetime supply of gelled electrolyte in a sealed chamber. Orion Research. Circle 721.

*Membrane Filter Selection Guide* summarizes the characteristics of such filters for a variety of research applications and includes a chemical compatibility chart. Schleicher & Schuell. Circle 722.

*Automated Peptide Synthesizers* is devoted to three models and includes a price list for chemicals and accessories for bench-top and fully automated systems. Vega Biochemicals. Circle 723.

*Guide to Searching the Biological Literature* includes 72 slides and two cassettes. It compares several search methods for the same subject to illustrate relative strength and weakness. Science Media. Circle 724.

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**Applied Mineral Exploration with Special Reference to Uranium**. Robert V. Bailey and Milton O. Childers. Westview Press, Boulder, 1977. xx, 542 pp., illus. $65.

**Biological Oceanographic Processes**. Timothy R. Parsons, Masayuki Takahashi, and Barry Hargrave. Pergamon, New York, ed. 2,1977. xii, 332 pp., illus. Paper, $15.90. Pergamon International Library. *To order this book circle No. 376 on Readers' Service Card*

**A Catalog of the Mosquitoes of the World**. (Diptera: Culicidae). Kenneth L. Knight and Alan Stone. Entomological Society of America, College Park, Md., ed. 2, 1977. xii, 612 pp. $12.50. Thomas Say Foundation, vol. 6.

**Cells, Molecules and Temperature**. Conformational Flexibility of Macromolecules and Ecological Adaptation. V. Ya. Alexandrov. Translated from the Russian by V. A. Bernstam. Springer-Verlag, New York, 1977. xii, 330 pp., illus. $39.60. Ecological Studies, vol. 21. *To order this book circle No. 377 on Readers' Service Card*

**A Change in the Weather**. Fitzhugh Green. Norton, New York, 1977. 248 pp., illus. $9.95.

**Chemical and Engineering Thermodynamics**. Stanley I. Sandler. Wiley, New York, 1977. xx, 588 pp., illus. $21.

**Chemical Engineering**. J. M. Coulson and J. F. Richardson. Vol. 4, Solutions to the Problems in *Chemical Engineering, Volume 1*. J. R. Backhurst and J. H. Harker. Pergamon, New York, 1977. viii, 208 pp. $15.50. *To order this book circle No. 378 on Readers' Service Card*

**Cross-National Comparative Survey Research**. Theory and Practice. Proceedings of a conference, Budapest, July 1972. Alexander Szalai and Riccardo Petrella, Eds. Pergamon, New York, 1977. xviii, 498 pp. $28. *To order this book circle No. 379 on Readers' Service Card*

**Deeper Pathways in High-Energy Physics**. Proceedings of a meeting: Coral Gables, Fla., Jan. 1977. Arnold Perlmutter and Linda F. Scott, Eds. Plenum, New York, 1977. viii, 744 pp., illus. $59.50. Studies in the Natural Sciences, vol. 12.

**Dimensional Instability.** An Introduction. Charles W. Marschall and Robert E. Maringer. Pergamon, New York, 1977. viii, 324 pp., illus. $25. Series on Materials Science and Technology, vol. 22. Pergamon International Library. *To order this book circle No. 381 on Readers' Service Card*

**Dynamics of Rotors**. Papers from a symposium, Varanesi, India, Dec. 1975. J. S. Rao, Ed. Pergamon, New York, 1977. vi + pp. 259–372, illus. Paper, $15. *Mechanism and Machine Theory*, vol. 12, no. 4. *To order this book circle No. 380 on Readers' Service Card*

**Dynamics of Solids and Liquids by Neutron Scattering**. S. W. Lovesey and T. Springer, Eds. Springer-Verlag, New York, 1977. xii, 380 pp., illus. $31.70. Topics in Current Physics, vol. 3. *To order this book circle No. 382 on Readers' Service Card*

**Education for Traditional Food Procurement in the Orinoco Delta**. Kenneth Ruddle and Ray Chesterfield. University of California Press, Berkeley, 1977. x, 172 pp. + plates. Paper, $9.50. Ibero-Americana: 53.

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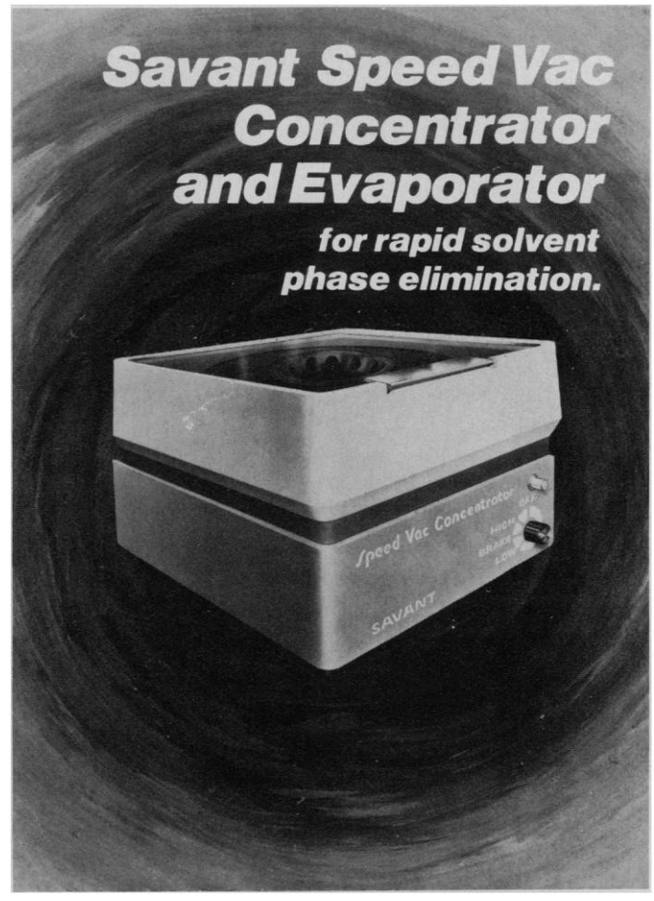


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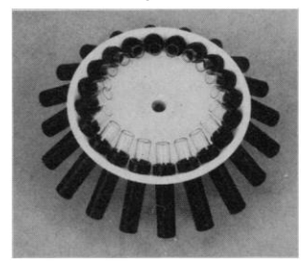

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Proceedings of a symposium, Fort Lauderdale, Fla., Dec. 1975. T. Nejat Veziroğlu, Ed. University of Miami Clean Energy Research Institute, Miami, 1977 (distributor, Pergamon, New York). xii, 680 pp., illus. Paper, $65. *To order this book circle No. 383 on Readers' Service Card*

**Group Theory for Social Workers**. An Introduction. Ken Heap. Translated from the Norwegian edition (Oslo). Pergamon, New York, 1977. xiv, 252 pp. $15. Social Work Series. Pergamon International Library. *To order this book circle No. 384 on Readers' Service Card*

**Handbook of Dam Engineering**. Alfred R. Golzé, Ed. Van Nostrand Reinhold, New York, 1977. xiv, 794 pp., illus. $54.50. *To order this book circle No. 385 on Readers' Service Card*

**Handbook of Solid Waste Management**. David Gordon Wilson, Ed. Van Nostrand Reinhold, New York, 1977. x, 752 pp., illus. $39.50. *To order this book circle No. 386 on Readers' Service Card*

**International Symposium on Solid Ionic and Ionic-Electronic Conductors**. Rome, Sept. 1976. R. D. Armstrong, Ed. Pergamon, New York, 1977. xii + pp. 677–810, illus. $20. Also published as *Electrochimica Acta*, vol. 22, no. 7. *To order this book circle No. 387 on Readers' Service Card*

**An Introduction to Chemical Engineering Kinetics and Reactor Design**. Charles G. Hill, Jr. Wiley, New York, 1977. xiv, 594 pp., illus. $22.95.

**An Introduction to Organic Chemistry**. William H. Reusch. Holden-Day, San Francisco, 1977. xxviii, 818 pp., illus. $19.95.

**Kreskin's Mind Power Book**. Kreskin. McGraw-Hill, New York, 1977. xii, 212 pp. $8.95.

**Land Policy and Urban Growth**. Haim Darin-Drabkin. Pergamon, New York, 1977. viii, 444 pp., illus. $16.50. Urban and Regional Planning Series, vol. 16. *To order this book circle No. 388 on Readers' Service Card*

**Large Engineering Systems**. Proceedings of a symposium, Winnipeg, Canada, Aug. 1976. Alvin Wexler, Ed. Pergamon, New York, 1977. xii, 710 pp., illus. $60. *To order this book circle No. 389 on Readers' Service Card*

**Lectures on Selected Topics in Statistical Mechanics** . D. ter Haar. Pergamon, New York, 1977. viii, 124 pp. $15. International Series in Natural Philosophy, vol. 92. *To order this book circle No. 390 on Readers' Service Card*

**Neurometrics**. Clinical Applications of Quantitative Electrophysiology. E. Roy John. Erlbaum, Hillsdale, N.J., 1977 (distributor, Halsted [Wiley], New York). xxii, 292 pp., illus. $19.95. Functional Neuroscience, vol. 2.

**Neuropeptide Influences on the Brain and Behavior**. Papers from a conference. Lyle H. Miller, Curt A. Sandman, and Abba J. Kastin, Eds. Raven, New York, 1977. xii, 298 pp., illus. $25. Advances in Biochemical Psychopharmacology, vol. 17.

**Neurophysics**. Alwyn C. Scott. Wiley-Interscience, New York, 1977. xii, 340 pp., illus. $24.95.

**A New Era in Space Transportation**. Proceedings of a congress, Anaheim, Calif., Oct. 1976. L. G. Napolitano, Ed. Pergamon, New York, 1977. viii, 452 pp., illus. $50. *To order this book circle No. 391 on Readers' Service Card*

**The Nonclassical Ion Problem**. Herbert C. Brown with comments by Paul von R. Schleyer. Plenum, New York, 1977. xxii, 302 pp., illus. $24.95.

**Organophosphorus Pesticides**. Criteria (Dose/Effect Relationships) for Organophosphorus Pesticides. R. Derache. Published for the Commission of the European Communities by Pergamon, New York, 1977. xii, 200 pp., illus. Paper, $19.50. *To order this book circle No. 401 on Readers' Service Card*

**Pensions and Industrial Relations**. A Practical Guide for All Involved in Pensions. Harry Lucas. Pergamon, New York, 1977. xiv, 192 pp. $15. *To order this book circle No. 392 on Readers' Service Card*

**Pesticide Handbook-Entoma**. 1977–78. Robert L. Caswell, Ed. Entomological Society of America, College Park, Md., ed. 27, 1977. 248 pp. Cloth, $9; paper, $7.50.

**Photosynthesis I**. Photosynthetic Electron Transport and Photophosphorylation. A. Trebst and M. Avron, Eds. Springer-Verlag, New York, 1977. xxiv, 732 pp., illus. $89.50. Encyclopedia of Plant Physiology, New Series, vol. 5. *To order this book circle No. 402 on Readers' Service Card*

**Physiology of the Heart**. Arnold M. Katz. Raven, New York, 1977. xiv, 450 pp., illus. $24.50.

**Point Mapping Stability**. Jacques Bernussou with the collaboration of J. L. Abatut, J. P. Babary, A. Giraud, Liu Hsu, and F. Roubellat. Pergamon, New York, 1977. xii, 104 pp., illus. $12.50. *To order this book circle No. 394 on Readers' Service Card*

**The Politics of Policy Making in America**. Five Case Studies. David A. Caputo, Ed. Freeman, San Francisco, 1977. xiv, 90 pp., illus. Cloth, $11.95; paper, $5.95.

**Pollutant Effects on Marine Organisms**. Proceedings of a workshop, College Station, Tex., May 1976. Lexington (Heath), Lexington, Mass., 1977. xii, 214 pp., illus. $16.

**Portrait of Nature**. The World as Seen by Modern Science. Alan Cottrell. Scribner, New York, 1977. 236 pp., illus. Paper, $4.95. Reprint of the 1975 edition.

**Pottery and Early Commerce**. Characterization and Trade in Roman and Later Ceramics. D. P. S. Peacock, Ed. Academic Press, New York, 1977. xvi, 340 pp., illus. $25.

**Problems in Metallurgical Thermodynamics and Kinetics**. G. S. Upadhyaya and R. K. Dube. Pergamon, New York, 1977. xvi, 252 pp. Cloth, $15; paper, $7.50. Materials Science and Technology, vol. 25. *To order this book circle No. 393 on Readers' Service Card*

**Progress in Ape Research**. Proceedings of a conference, 1976. Geoffrey H. Bourne, Ed. Academic Press, New York, 1977. xiv, 300 pp., illus. $16.

**Protein Metabolism of the Brain**. A. V. Palladin, Ya. V. Belik, and N. M. Polyakova. Translated from the Russian edition (Kiev, 1972) by Basil Haigh. Abel Lajtha, Transl. Ed. Consultants Bureau (Plenum), New York, 1977. xii, 336 pp., illus. $35. Studies in Soviet Science.

**Proteins of Iron Metabolism**. Papers from a meeting, New York, Apr. 1977. Elmer B. Brown, Philip Aisen, Jack Fielding, and Robert R. Crichton, Eds. Grune and Stratton, New York, 1977. xxxiv, 444 pp., illus. $35. *To order this book circle No. 405 on Readers' Service Card*

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**Psychology of Learning**. Readings. William L. Mikulas, Ed. Nelson-Hall, Chicago, 1977. xvi, 592 pp., illus. $19.95. *To order this book circle No. 396 on Readers' Service Card*

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Cherniack. Saunders, Philadelphia, 1977. vi, 292 pp., illus. Spiral bound, $8.50.

**Pupillometry**. The Psychology of the Pupillary Response. Michel Pierre Janisse. Hemisphere, Washington, D.C., and Halsted (Wiley), New York, 1977. xiv, 204 pp., illus. $22.50. The Series in Clinical and Community Psychology.

**Recent Advances in Cancer Treatment**. Papers from a symposium, Brussels, Sept. 1976. Henri J. Tagnon and Maurice J. Staquet, Eds. Raven, New York, 1977. xvi, 360 pp., illus. $26. Monograph Series of the European Organization for Research on Treatment of Cancer, vol. 3.

**The Rise of American Philosophy**. Cambridge, Massachusetts, 1860–1930. Bruce Kuklick. Yale University Press, New Haven, Conn., 1977. xxviii, 674 pp., illus. $17.95.

**The Science and Practice of Welding**. A. C. Davies. Cambridge University Press, New York, ed. 7, 1977. xiv, 714 pp., illus. $13.95.

**Science with Young Children**. Bess-Gene Holt. National Association for the Education of Young Children, Washington, D.C., 1977. viii, 136 pp., illus. Paper, $3.25. *To order this book circle No. 398 on Readers' Service Card*

**Sedimentary Petrology**. W. v. Engelhardt, H. Füchtbauer, and G. Müller. Part 3, The Origin of Sediments and Sedimentary Rocks. Wolf v. Engelhardt. Translated from the German edition (Stuttgart, 1973) by William D. Johns. Schweizerbart'sche Verlagsbuchhandlung, Stuttgart, and Halsted (Wiley), New York, 1977. viii, 360 pp., illus. $49.50.

**Selective Heat Sensitivity of Cancer Cells**. A. Rossi-Fanelli, R. Cavaliere, B. Mondovi, and G. Moricca, Eds. Springer-Verlag, New York, 1977. xii, 190 pp., illus. $26.40. Recent Results in Cancer Research, vol. 59. *To order this book circle No. 397 on Readers' Service Card*

**Shock**. Pathology, Metabolism, Shock Cell, Treatment. Iuliu Şuteu, Traian Băndilă, Atanasie Cafriţă, Alexandru I. Bucur, and Vasile Cândea. Translation and revision of the Romanian edition (Bucharest, 1973). Abacus Press, Tunbridge Wells, Kent, England, 1976 (U.S. distributor, ISBS, Forest Grove, Ore.). xxiv, 448 pp., illus. + plates. $49. *To order this book circle No. 400 on Readers' Service Card*

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**The Thames Transformed.** London's River and Its Waterfowl. Jeffrey Harrison and Peter Grant. Photographs by Pamela Harrison. Deutsch, London, 1976 (U.S. distributor, Transatlantic Arts, Levittown, N.Y.). 240 pp. + plates. $15.

**Two-Phase Flow and Heat Transfer Symposium-Workshop**. Fort Lauderdale, Fla., Oct. 1976. T. Nejat Veziroğlu, Ed. Pergamon, New York, 1977. xii, 318 pp., illus. Paper, $35. *To order this book circle No. 399 on Readers' Service Card*

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