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COVER Adult brown wheat mite, *Petrobia latens* Muller (body size about 0.5 millimeter). This spider mite species transmits the causal agent of a unique virus-like disease of barley. Although the disease is currently known to be confined to Montana and contiguous areas in Canada, the mite is distributed throughout the world and therefore presents a threat to other barley-producing regions. See page 1188. [Nancy L. Robertson, Montana State University, Bozeman, MT 59717]

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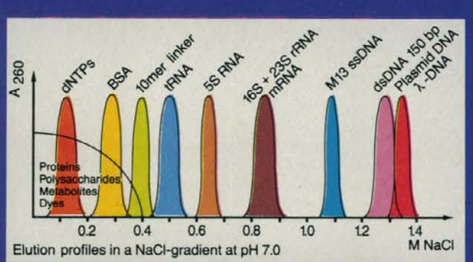

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Engine design

CAN performance and durability of internal combustion engines of cars, trucks, and tanks be improved (page 1157)? New impetus has been added to this pursuit because of recent concerns about air pollution and declining domestic production of petroleum-based fuels. Zucchetto *et al.* discuss how new ceramic materials and various new technologies might be applied to improving engine efficiency. One area of interest has been in construction of low heat rejection engines (to reduce heat loss); such engines might have special pay-offs for combat vehicles. The United States has been slow in comparison with other countries (notably Japan and countries of the European Economic Community) in researching and developing new engine technologies; U.S. efforts will have to be revved up and better coordinated if the United States is to contribute to, compete in, and benefit (economically and in terms of national security) from advanced engine technologies and their expected spin-offs.

Ion channels

PROTEINS that conduct ions across membranes are called ion channels (page 1177). They typically consist of several homologous domains. Subunits form alpha helices with polar and apolar faces, polar faces are thought to line up to form hydrophilic patches, and patches align into ion-conducting pores. Lear *et al.* describe three synthetic ion channel proteins made up solely of two amino acids, leucine (for the apolar face) and serine (for the polar face). Peptides with 21 amino acids could span a lipid bilayer membrane and conduct ions; a shorter peptide could not. The two 21–amino acid peptides differed in only one amino acid per heptad subunit but had different conducting properties. In addition, pore diameters (inferred from conductance measurements) and multimer arrangements (inferred from models) differed. The most favorable conformation and packing arrangement predicted for each synthetic peptide matched well its observed properties. Principles deduced from these studies may be applicable to the design of channels that could be of biologic usefulness.

Brewing troubles

MALTING barley–producing areas of Montana and Canada have been hit by a disease that is reaching epidemic proportions (page 1188). The disease was noted first in Montana in 1982 in one barley field. Robertson and Carroll report that large virus-like particles transmitted by brown wheat mites (cover) are associated with the disease. The disease is unusual in both its virus and its vector: plant viruses are typically smaller than those found in the diseased barley plants (some of which, like animal viruses, are over 4000 nanometers long), and the brown wheat mites have not previously been known to be vectors of pathogens. The particles are transmitted by way of the mite ovaries to the eggs; eggs appear to serve as overwintering hosts for the pathogen. A combination of severe drought conditions between 1983 and 1986 (the mites are dry weather pests) and tremendous expansion of the barley acreage during those years appears to have contributed to the spread of this disease.

Predator-prey reversal

IN summer, dry holes in trees in western North America provide a home for mosquito eggs (of *Aedes sierrensis*) and protozoan cysts (of *Lambornella clarki*); when the holes fill with water during the rainy season, dormant eggs hatch into mosquito larvae and dormant cysts produce free-swimming ciliates (page 1193). The mosquito larvae feed on *L. clarki* and other protozoa in the water and also release into the water a factor that transforms free-swimmers into parasites. Thus, rather quickly, free-swimming ciliates are depleted. The parasitic protozoa then form cysts on the mosquito larvae, bore inside, and cause death; with killing, more parasites are released that can encyst on, enter, and kill other larvae. Washburn *et al.* speculate that this unusual reversal of the predator and prey relation, though induced by the mosquito, might have evolved as a way of preserving the protozoa. Because this relation can dramatically deplete mosquito populations, *L. clarki* might be an effective biologic agent for controlling mosquitoes. The system is one in which stages in and inducers of protozoan morphogenesis can be followed.

Retinal cells

AN unusual morphology characterizes a subset of cat retinal cells in which the neurotransmitter dopamine accumulates (page 1196). When both dopamine and a second substance (a monoamine analog) are injected into eyes of anesthesized cats, the dopamine-accumulating (DA) amacrine cells emit a distinctive bright green fluorescence. Cells can be detected in live retinas in an in vitro preparation and can then be injected with a stain that permits detailed morphologic analysis. These DA amacrine cells have several thick dendritic branches radiating outward; each branch tapers to give rise to a thin axon-like projection extending several millimeters farther. The projections are long and have many probable synaptic contacts with other amacrine cells. Dacey speculates that the long processes may function like axons, may give rise to action potentials, and may contribute to long-range interactions in the retina.

The bottom lines

The light-addressable potentiometric sensor can simultaneously measure *p*H, redox potentials, and transmembrane potentials; applications of this miniaturized device may include use as a biosensor and as a monitor of chemical and physical changes in enzyme-linked immunochemical assays (page 1182).

AMBIS screen image of 2-D gel analysis of ^{35}S-labeled whole cell proteins from murine Swiss 3T3 fibroblasts. Number in second box from bottom of screen, 1491, indicates quantitation of radioactivity in calmodulin. Courtesy of Herbert L. Cooper, National Cancer Institute.

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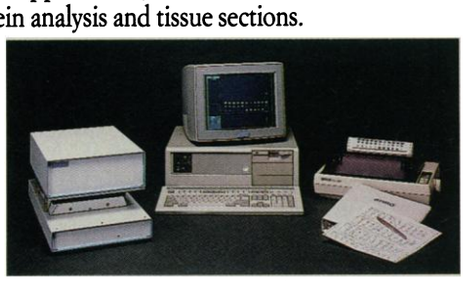

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Need for Long-Range Energy Policies

Energy has not had much attention lately, but it is a matter that should be under continuing high-level consideration. The National Academy of Engineering has chosen to emphasize the importance of the topic. For the inaugural symposium of the prestigious Arnold and Mabel Beckman Center at Irvine, California, on 11 and 12 May, the title chosen was "An energy agenda for the 1990s." Contents of the talks were largely on uses of the various forms of energy, the pollution problems arising therefrom, the desirability of expanding the role of natural gas, the need to increase efficiency in the application of energy, and the requirement of long-range, steadfast energy policies. Robert Malpas, managing director of the British Petroleum Company, spoke on "A view of global forces in the energy scene." He pointed to the emotions aroused when energy is used to foster material well-being, while at the same time, there are increasing fears about the finiteness of oil, about nuclear power, and about acid rain and the greenhouse effect. Malpas pointed out that there is a clear option that would minimize both the supply and pollution problem, namely, to accelerate the rate of increasing energy efficiency. He pointed out, however, that at present the drop in price for oil makes it difficult for the public to understand that crude oil supplies are finite. Also, low prices do not encourage investment for energy efficiency.

Malpas called attention to unrealistic attitudes of the public which, he said, ". . . concludes that technology will come to their rescue on every issue. They believe that it will continue to stretch out the finiteness of oil, . . . and that it will reduce the energy needed per unit of output, without any action or investment on their part. They also believe that environmental and ecological concerns will be solved by the cavalry—technology—riding over the hill!"

The recent record of the United States in improving energy efficiency is not very good. Between 1974 and 1983, U.S. industry reduced unit energy consumption 20 percent. But at the same time, Japanese industry achieved a reduction in unit energy consumption of 50 percent. Due in part to an expansion of the number of U.S. cars and trucks, consumption of petroleum products here for transportation is setting new all-time records.

The dynamism of some newly industrialized countries will surely lead to much greater utilization of energy by them and greater demands for petroleum in the not distant future. In the competition for oil imports, the people of the United States may find themselves at a disadvantage. Others using advanced technology are willing to work longer hours for lower pay while enduring more pollution. The United States may find it necessary to change patterns of energy usage to lessen dependence on imported oil.

At the Beckman symposium, Chauncey Starr, emeritus president of the Electric Power Research Institute, made an interesting case for an expanded future for electricity. He cited two developments that could ultimately be of great importance—fuel cells and improved batteries making electric automobiles more feasible. Research and development of fuel cells has been meeting with increasing success. Fuel cells can achieve efficiencies of 60 to 80 percent. A phosphoric acid fuel cell employs an input of hydrogen and air. The hydrogen can be obtained from hydrocarbons or by gasification of coal. Improvements in the lead-acid battery and of electric vehicles has made the combination marginally competitive for short-range urban uses. Also improvements in the nickel-iron cell have produced a battery with 50 percent more energy storage per unit weight than the lead-acid cell. Starr stated that a successful 100-mile-range electric automobile could satisfy 92 to 95 percent of the average family's trips and could provide 66 to 74 percent of the annual miles traveled, reducing national oil needs by as much as half and reducing urban pollution.

The overwhelming odds are that the United States will eventually be forced to make the transition to an energy economy based on its own natural resources and employing more highly efficient use of energy. Either the transition will be conducted in a gradual, orderly manner, or it will be conducted in a long drawn-out painful way after a major crisis. Technology cannot come riding over the hill to produce a sudden solution.

—PHILIP H. ABELSON

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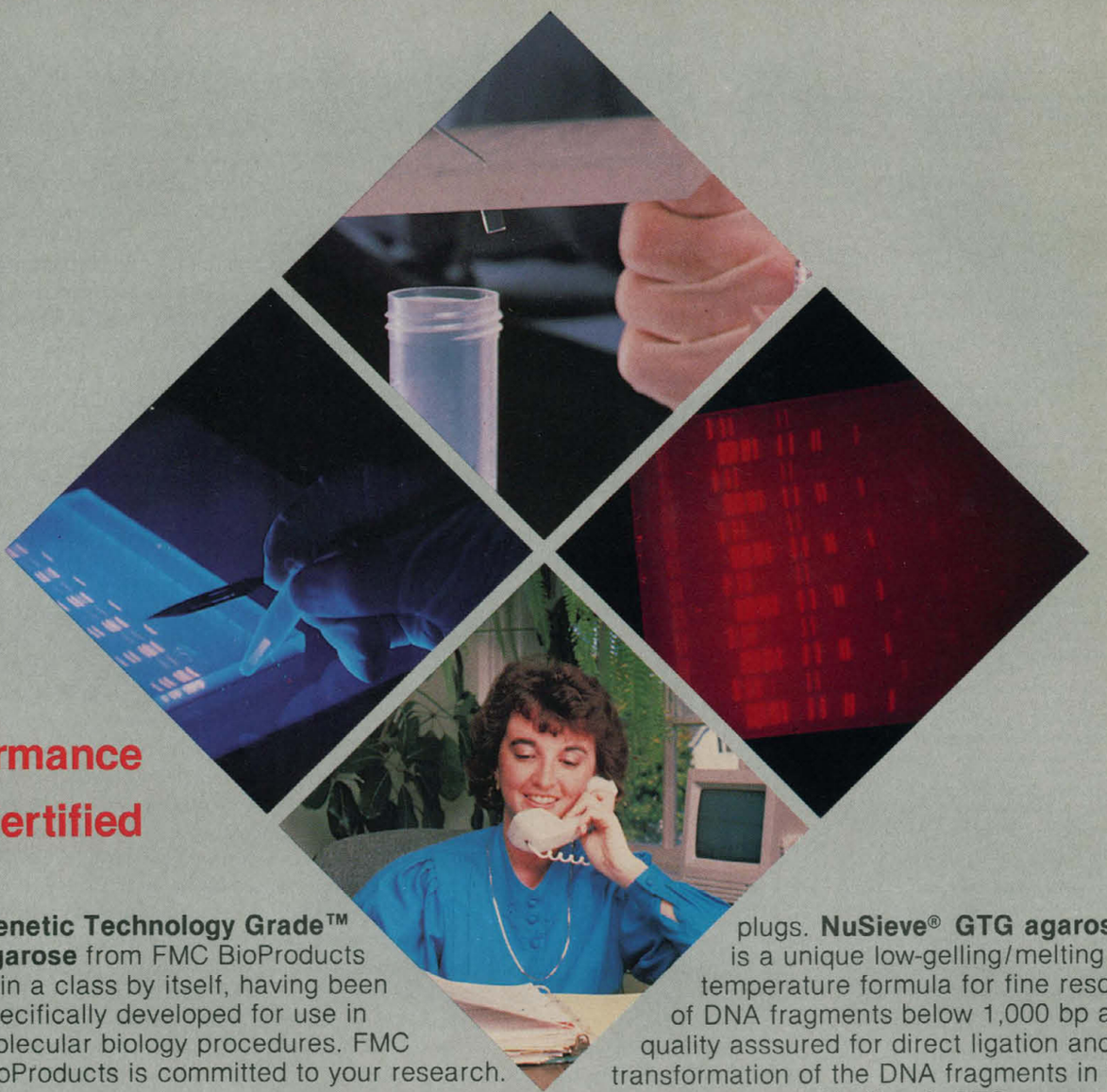

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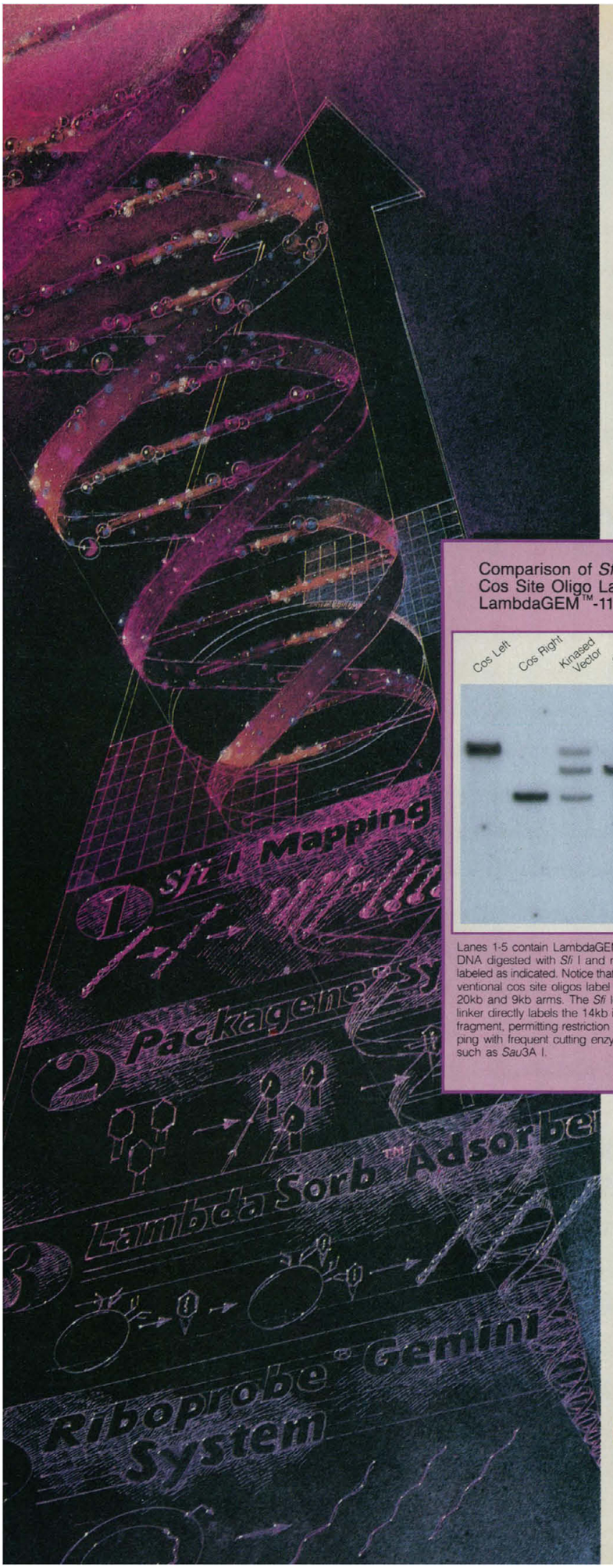

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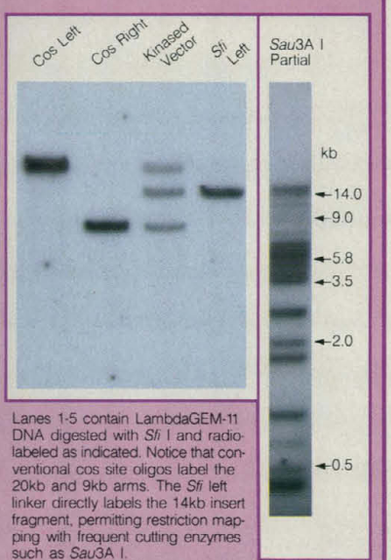
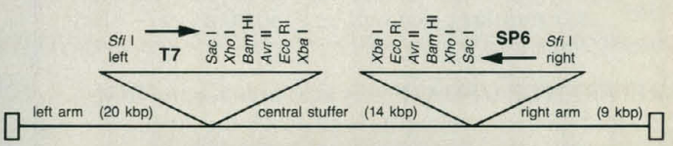


Lanes 1-5 contain LambdaGEM-11 DNA digested with *Sfi* I and radiolabeled as indicated. Notice that conventional cos site oligos label the 20kb and 9kb arms. The *Sfi* left linker directly labels the 14kb insert fragment, permitting restriction mapping with frequent cutting enzymes such as *Sau*3A I.



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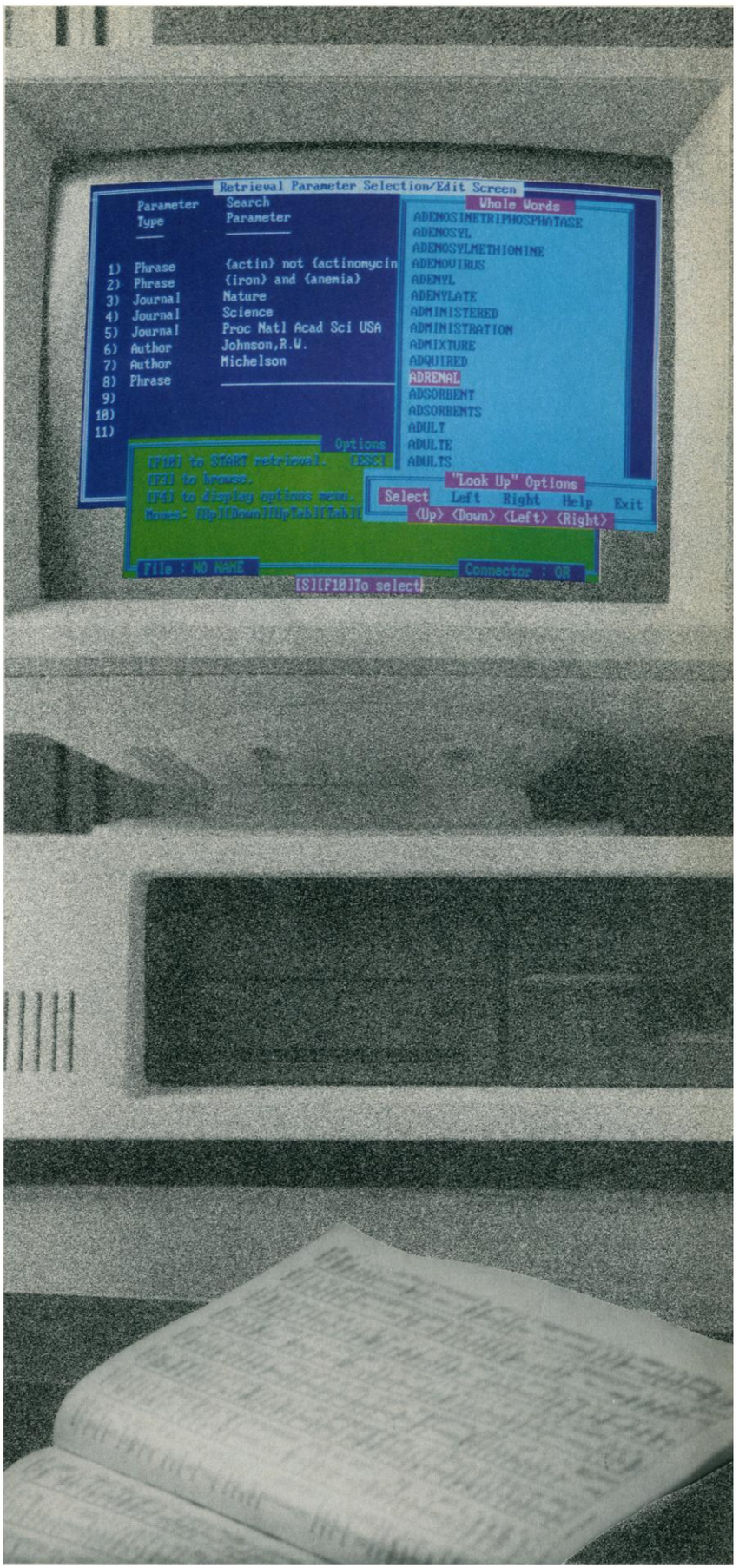

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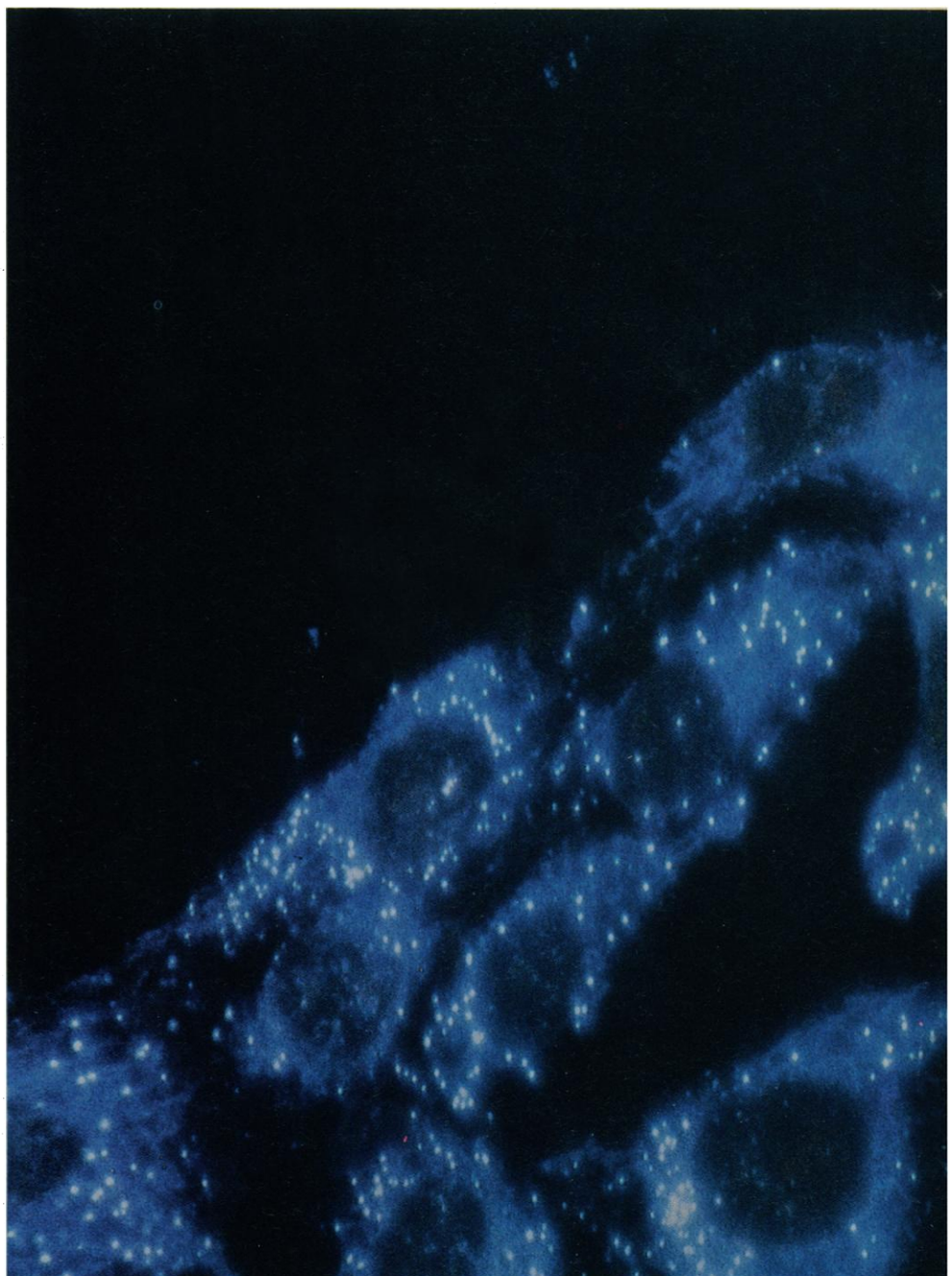

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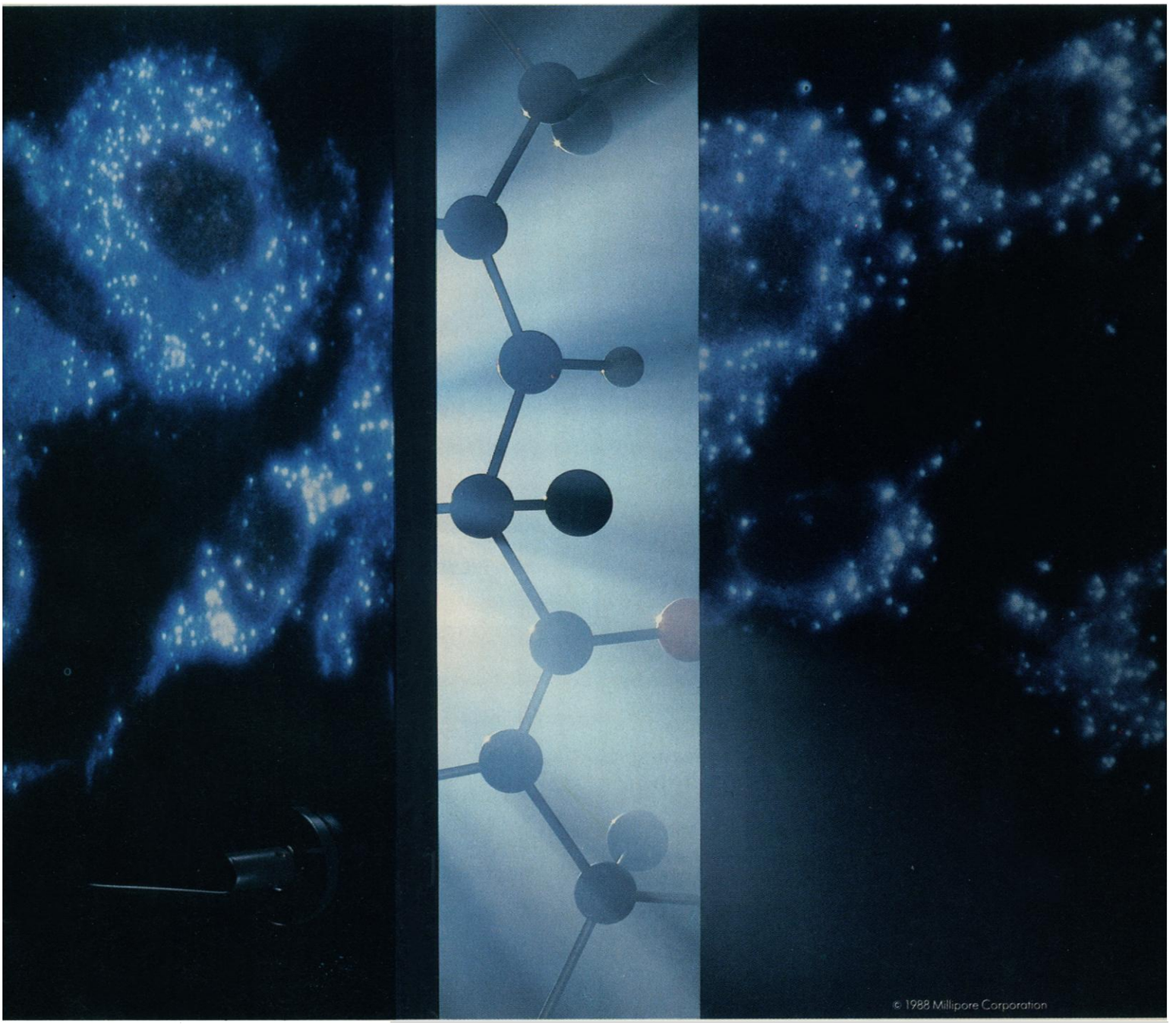

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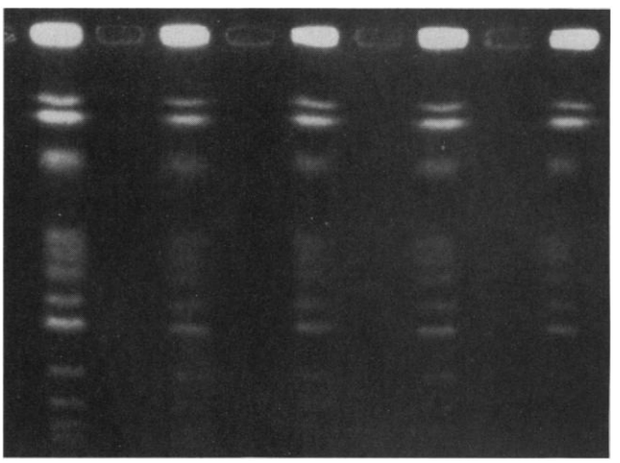

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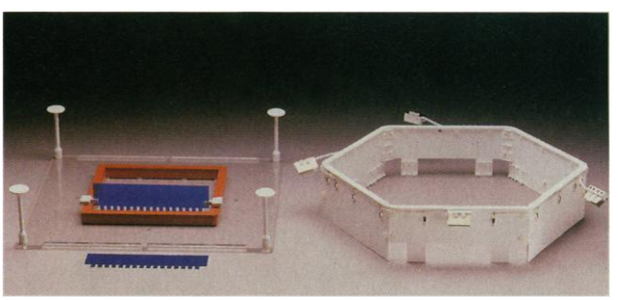

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The dumping of cage bedding and animal waste can create—and then lead to—the inhalation of aerosolized contaminants by animals and lab personnel. Such animal exposure can interfere with—or even jeopardize—research studies. And inhalation of contaminants by personnel can result in serious health consequences. Up until now, *this* has been the weak link in the animal facility contamination-containment chain.

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Removing optional paper bag.

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Patents applied for.

Now this new Lab Products partial containment system substantially reduces the level of airborne contaminants by restricting all cage dumping to the inside of a negative air flow cabinet; that is, with air flowing *from* the room and *into* the cabinet. The aerosolized particulates are washed out of the airstream by a remarkably effective three-stage filter system and so clean HEPA-filtered air circulates back into the room.

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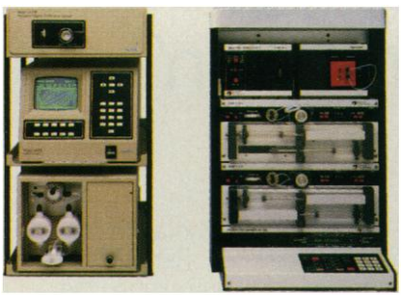

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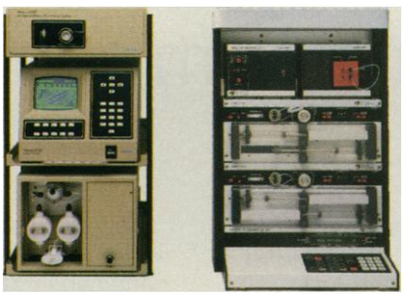

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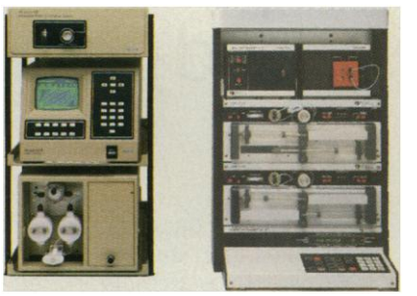

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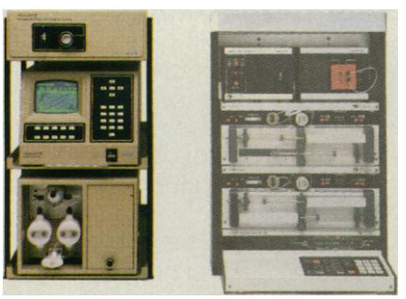
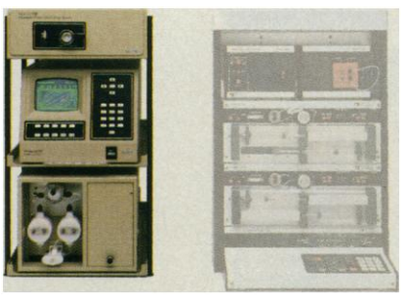


If you want versatile methods optimization using linear or non-linear gradients with up to four buffers, there's only one real choice.



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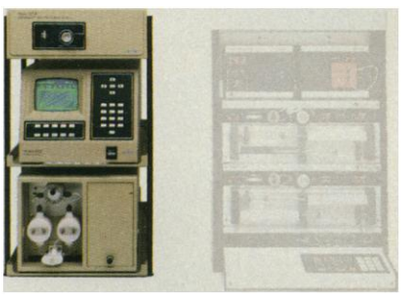

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What is a "Ventilated Animal Rack"?

It is a portable, totally enclosed animal rack with four separate, independent, isolated-from-each-other chambers. Low velocity air enters each chamber, makes a single pass over the cages, and is exhausted by negative pressure directly to the main exhaust system. This special rack (VR-1) most effectively isolates the animals from the animal room . . . and the research personnel from the animals.

What are the benefits to the animals?

There are many. Cross-contamination is substantially decreased because air from an infected animal goes to the exhaust system with an absolute minimal exposure of the other animals. Animal stress is also significantly reduced: the enclosed environment is quiet; drafts and thermal and humidity fluctuations are greatly minimized; and animals can be easily observed without inducing stress. The success of this environment is attested to by the fact that the total number of animals born to a species that breeds poorly (DBA/2J mice) is increased and the percent survival is also appreciably higher. Additional evidence: judging by acceleration of weight gain, newly arrived animals housed in this system become acclimated more rapidly. Further evidence? Even multiple species can be successfully housed in the same rack.

What are the benefits to the research workers?

Since the air in the rack is exhausted into the main exhaust system and does *not* re-enter the animal room itself, research workers are effectively isolated from animal dander or other allergens, odor, pheromones, microorganisms, and food and bedding dust. Even with the doors of the unit open, the direction of air flow tends to be *from* the room and *into* the unit which helps to contain contaminated air *within* the unit. Result: virtual elimination of allergic reactions and generally, a cleaner, safer, odor-free work environment for the research people.

What are the benefits to research programs?

Because this system greatly reduces the chance of cross-contamination, and because it provides a much less stressful environment generally (e.g., it tends to reduce the amount of animal handling required), the chances of jeopardizing expensive research programs are substantially minimized.

*Many of these systems are already installed in major research institutions . . . and conversion to these ventilated animal racks is accelerating.

Are there other benefits?

The air velocity is variable and is separately adjustable for *each* shelf. The system offers a choice of bottle watering or a specially designed upfeed serpentine automatic watering configuration that eliminates stagnant water, permits flushing during the day, and significantly minimizes contamination. This rack also permits excellent space utilization since multiple species can be safely housed in the same room. Cleaning is easy; VR-1 can be handled by most standard rack washers. The unit is quiet. And, in summary, it is a most effective isolation system *that can actually divide a room into multiple separate, isolated environments.*

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The VR-1 is the subject of one or more pending patents.

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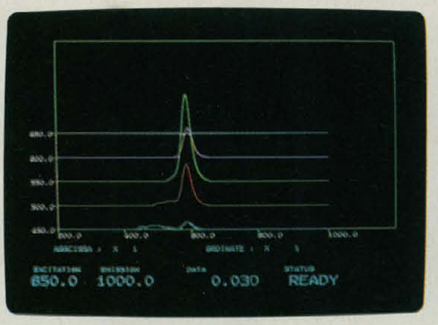
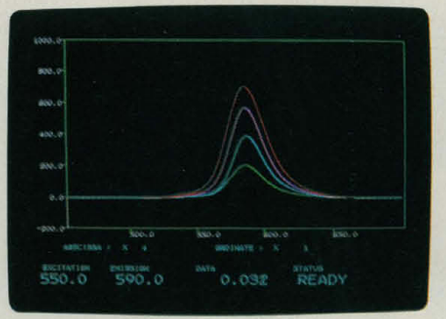
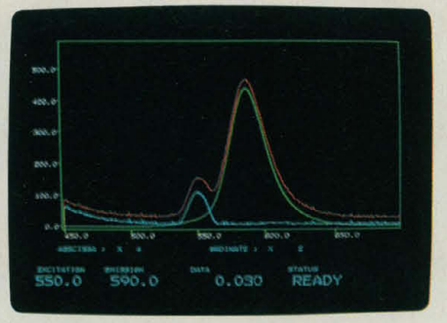


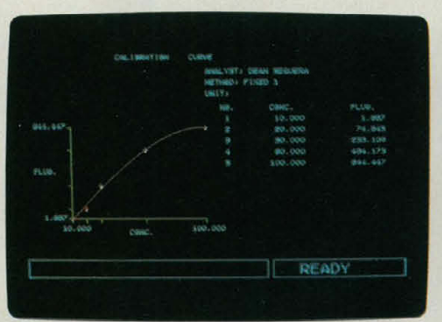
8:00 AM *Automatic 3D Search for Optimal Excitation and Emission Wavelengths*



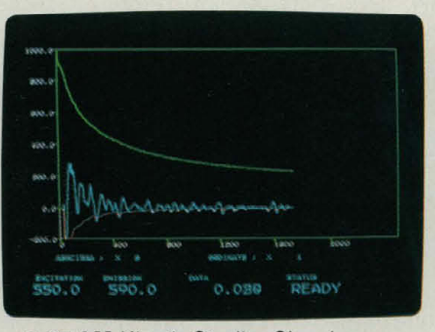
8:09 AM *Determination of an Optimal Band Pass from 1.5 to 30nm*



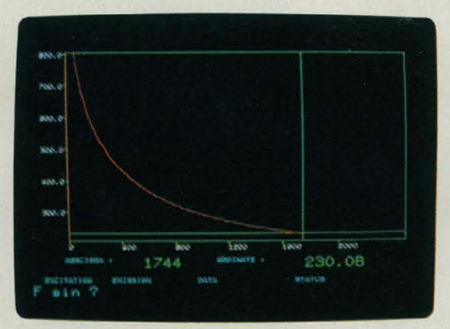
8:17 AM *Spectral Manipulation Showing Subtraction of the Background with Zooming*



8:26 AM *Quantitation Analysis Using a Higher Order Calibration Curve*



8:37 AM *Kinetic Studies Showing 1st and 2nd Derivatives*



8:51 AM *Automatic Fura-2 Ca^{++} Determination*

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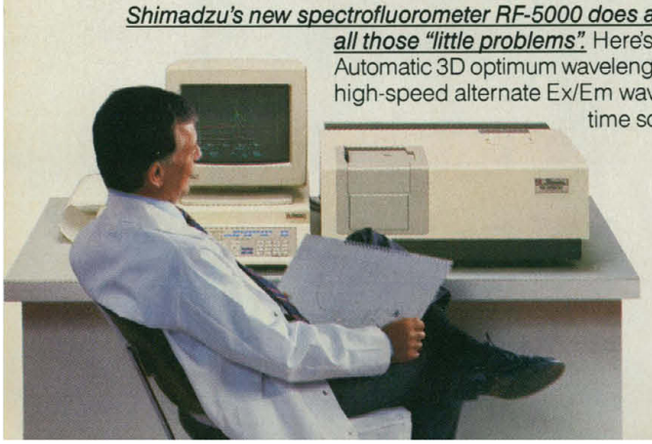
A chemists dream: Convenience, accuracy, sensitivity, speed and great data handling too. Fluorescence spectroscopy used to be slow, cumbersome and full of annoying little problems. It seemed to take forever to find the optimum wavelength for excitation or emission, in order to take a scan. It was cumbersome to correct for Raman or Rayleigh scatter, and quantitation curves were hardly ever linear. Besides, it didn't have quite enough dynamic range, and sensitivity left a lot to be desired. Not anymore.

Shimadzu's new spectrofluorometer RF-5000 does away with all those "little problems". Here's how: Automatic 3D optimum wavelength search; high-speed alternate Ex/Em wavelength time scan (slews at 9000 nm/min!); quantitative analysis with first through third order curve fits (with linear, log, log-logit axes!); S/N typically found to be over 400 with a 10 nm bandpass (Ex and Em) for the Raman band of H_2O at 350 nm Ex and 397 nm Em; storage of 15 scans, 4 calibrations, 8 parameter files and 4 time scan files; addition, subtraction and smoothing—even on the fly! And for superior data presentations it comes with a high resolution color video display and a high resolution alphanumeric and graphic printer/plotter.



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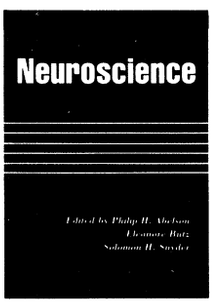

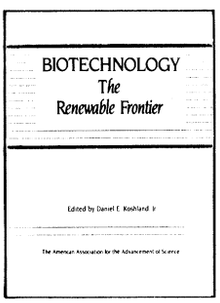

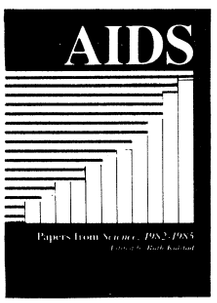

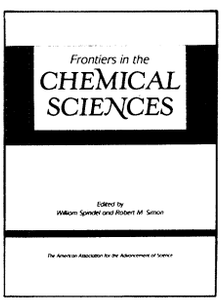

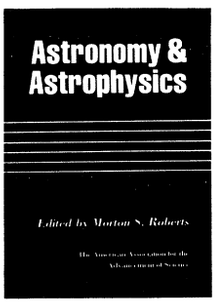

Neuroscience
Edited by Philip H. Abelson, Eleanore Butz, and Solomon H. Snyder
A collection of 27 *Science* articles on neuroscience research — ranging from genetic engineering to clinical therapy. Provides an integrative treatment of brain anatomy, physiology, and chemistry, and addresses fundamental questions concerning nervous system functioning. *1985; 454 pp.; hardcover $29.95 ($23.95 for AAAS members); softcover $14.95 ($11.95 for AAAS members); AAAS Publication #84-13.*

Biotechnology: The Renewable Frontier
Edited by Daniel E. Koshland, Jr.
Covers the latest and most important topics at the forefront of biological research in 26 papers from *Science*. Illustrates the extraordinary cross-disciplinary aspects of modern biology and its tremendous impact on the future. Topics include virology, immunology, developmental biology, cancer, hormones, sensory phenomena, and more. *1986; 384 pp.; hardcover $29.95 ($23.95 for AAAS members); softcover $17.95 ($14.35 for AAAS members); AAAS Publication #85-26.*

AIDS: Papers from *Science*, 1982–1985
Edited by Ruth Kulstad
Presents some of the most frequently cited research papers and news reports on AIDS, published in *Science* between 1982 and 1985. Chronicles how far AIDS research has come and provides an indication of the direction in which it might go. An overview of AIDS research is provided by Myron Essex, chairman of the Department of Cancer Biology, Harvard University School of Public Health. *1986; 654 pp.; hardcover $32.95 ($26.35 for AAAS members); softcover $19.95 ($15.95 for AAAS members); AAAS Publication #85-23.*

Frontiers in the Chemical Sciences
Edited by William Spindel and Robert M. Simon
Describes recent progress in all areas of chemistry, including new work in ultrafast reactions, chemical catalysis, organic synthesis, enzyme mechanisms, theoretical chemistry, analysis, and the chemistry of materials. Compiled from 38 *Science* articles. *1986; 624 pp.; hardcover $29.95 ($23.95 for AAAS members); softcover $17.95 ($14.35 for AAAS members); AAAS Publication #85-10.*

Astronomy & Astrophysics
Edited by Morton S. Roberts
From our own solar system to the pulsars at the very edge of the cosmos, this collection of 24 articles from *Science* reveals a broad, coherent, and contemporary picture of our astronomical universe. Topics include galaxies and cosmology, the solar system, instrumentation, and the structure and content of the galaxy. *1985; 384 pp.; hardcover $29.95 ($23.95 for AAAS members); softcover $17.95 ($14.35 for AAAS members); AAAS Publication #85-4.*

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tion between private and public patriarchy. If anything, it is an illustration of the reasons why patriarchy has remained a problematic concept. According to the author, women were originally oppressed by men as members of families. This constituted a private form of patriarchy. Industrial capitalism gradually broke down the bonds of kinship, substituting for them impersonal forms of authority in the marketplace, the firm, and the corporation. This represented a triumph of public over private patriarchy. From this overly schematic approach, the author has no alternative but to conclude that public patriarchy, though still oppressive of women, represents an improvement over the past insofar as it provides freer access to jobs and earnings and therefore greater autonomy and independence for women.

Undoubtedly, some women have benefited from changes brought about by industrial capitalism as a result of their membership in privileged classes. Others have found their conditions of life debased as a result of the same process. The point is that neither of these transformations can be fully explained by invoking patriarchy in isolation from other factors. To say that class and ethnicity also matter is not enough unless we are willing to examine the articulation between patterns of domination and labor appropriation involving men as well as women.

One way to do this is by investigating the part played by gender in the maintenance of exploitative systems of production. Highly polarized definitions of womanhood and manhood have been key factors in the maintenance of class-divided societies. Expectations and behaviors surrounding definitions of manhood have been instrumental in the exploitation of male labor. "Providers" and "heads of households" may obtain net benefits from their status, but they are also compelled to fulfill onerous responsibilities that subordinate them to employers.

In a complementary vein, the ideal of transforming all women into home-bound mothers and wives serves to obscure the manner in which reproductive labor subsidizes processes of capitalist accumulation by absorbing costs that investors are unwilling to assume. By taking such factors into consideration, we are in a better position to understand the mechanisms that link class with gender.

Then there is the question of resistance and outright confrontation. Neither women nor men have invariably accepted institutional definitions passively. Three chapters in *Hidden Aspects of Women's Work* explore this subject. One is an engaging description of work and labor organizing in Troy, New York, in the late 19th century. This excellent piece discusses the relationship between family composition and women's participation in workers' organizations. This issue has important implications for understanding working women in general. The author correctly states that avoiding stark contrasts between women and men and looking at conditions under which some women are able to organize successfully reveals subtle differences between male and female workers and among women workers in the same and different industries, occupations, and communities.

A final word of praise should be said about two other chapters, one dealing with the elaboration of minimum wage legislation for women between 1910 and 1925 and one relating the peculiar undercount of women's employment in 1900 and 1980. The first piece is exemplary for its breadth and detail. The second confirms a long-held suspicion: The apparent jump in women's employment during the latter half of the 20th century may be an artifact of census methodologies that tended to ignore women as "real" workers in the past. That most people still believe that women's involvement in productive labor is a recent phenomenon is a testimony to the power of ideology over facts.

Perhaps the most important contribution of *Hidden Aspects of Women's Work* is that it adds new information to the vital and ongoing debate about the meaning of women's labor. This is a theme that should be of interest to social scientists of various theoretical persuasions.

M. PATRICIA FERNÁNDEZ KELLY
Institute for Policy Studies,
Johns Hopkins University,
Baltimore, MD 21218

Champions of Relativity

Einstein in Spain. Relativity and the Recovery of Science. THOMAS F. GLICK. Princeton University Press, Princeton, NJ, 1988. xiv, 391 pp., illus. $42.

In the words of its author, this book is "a contribution to the history of civil discourse in matters of science in an ideologically polarized society" (p. xi). Glick, who has previously examined the reception of Darwinism and psychoanalysis in Spain, argues that the enthusiastic response to relativity—crystallized by the visit of Albert Einstein to Spain in 1923—was the result of a new consensus among an otherwise ideologically divided elite on the need for more scientific research, a consensus that disintegrated only in the tense political atmosphere of the

(Continued on page 1212)

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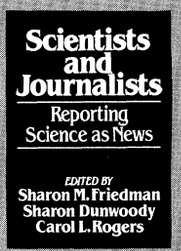
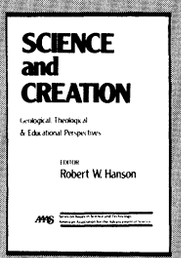
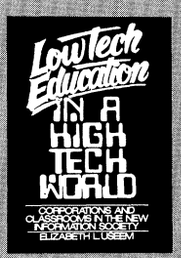
Issues in Science and Technology



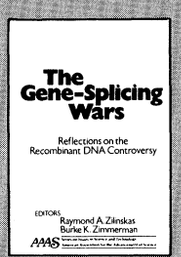
Scientists and Journalists: Reporting Science as News, ***Edited by Sharon M. Friedman, Sharon Dunwoody, and Carol L. Rogers.***
The public is interested in science and depends largely on the mass media for the latest information. But how well do scientists and journalists communicate with each other and to the public? This book examines the links between scientists and journalists as seen through the eyes of both. 1986; 334 pp.; hardcover $24.95 ($19.95 for AAAS members); AAAS Publication #86-20.



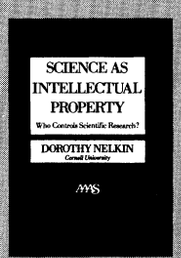
Science and Creation: Geological, Theological, and Educational Perspectives, ***Edited by Robert W. Hanson.***
The creation/evolution controversy is examined by scientists, theologians, educators, and historians. These authors view the controversy as a false dichotomy and as an attempt to force a choice between two ideas that are not mutually exclusive. Includes case studies from several states. 1986; 240 pp.; hardcover $24.95 ($19.95 for AAAS members); AAAS Publication #86-19.



Low Tech Education in a High Tech World: Corporations and Classrooms in the New Information Society, ***By Elizabeth L. Useem.***
Are students in the U.S. developing the skills necessary for a high technology society, or will it be technological boom, educational gloom? Useem examines education in California's "Silicon Valley" and Boston's Route 128, two of the country's leading high tech centers, and suggests ways for education and industry to forge a stronger partnership for the future. 1986; 278 pp.; hardcover $19.95 ($15.95 for AAAS members); AAAS Publication #86-21.



The Gene-Splicing Wars: Reflections on the Recombinant DNA Controversy, ***Edited by Raymond A. Zilinskas and Burke K. Zimmerman.***
Questions of safety and ethics about recombinant DNA techniques continue to surface. This book takes a look at historical, political, industrial, scientific, and international aspects of these issues. The authors show how lessons learned from the experience can be used to cope with similar issues in the future. 1986; 288 pp.; hardcover $24.95 ($19.95 for AAAS members); AAAS Publication #86-18.



Science as Intellectual Property: Who Controls Scientific Research? ***By Dorothy Nelkin.***
Who controls research? A growing number of legal and administrative disputes raise critical issues of professional sovereignty, scientific secrecy, and proprietary rights. Nelkin offers cases illustrating the dilemmas that arise as the interests of scientists, the rights of citizens, and the security needs of government and industry come into increasing conflict. 1984; 130 pp.; softcover $9.00 ($7.25 for AAAS members); AAAS Publication #84-17.

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ommend that libraries buy it and that everybody working in the field have a look at it and read some of the chapters. As evidenced by this book, optimal foraging is emerging from a troubled adolescence into an uncertain future. I shall guess that its future will be shaped, at least in part, by the ideas on learning and memory—and possibly on game theory—presented in this volume.

NILS CHR. STENSETH
Division of Zoology,
University of Oslo,
P.O. Box 1050, Blindern,
N-0316 Oslo 3, Norway

North American Paleontology

Late Quaternary Mammalian Biogeography and Environments of the Great Plains and Prairies. RUSSELL W. GRAHAM, HOLMES A. SEMKEN, JR., and MARY ANN GRAHAM, Eds. Illinois State Museum, Springfield, IL, 1987. xiv, 491 pp., illus. Paper, $20. Illinois State Museum Scientific Papers, vol. 22. Based on symposium, Iowa City, IA, 1980.

The 12 papers in this volume are dedicated to Ernest L. Lundelius, Jr., in recognition of his work on the paleontology of mammals in North America, especially central Texas. The main authors are R. W. Graham and H. A. Semken, Jr., who author or coauthor five papers and the introductory chapter, "Philosophy and procedures for paleoenvironmental studies of Quaternary mammalian faunas."

The Late Pleistocene or Holocene faunas of Illinois and Missouri, of the northern, central, and southwestern Great Plains, of the Northern Bighorn Mountains, of Montana and southern Alberta and Saskatchewan, and of the Lange/Ferguson Clovis Site in South Dakota are considered in individual chapters. Each of these chapters assembles many data on mammalian, particularly micromammalian, temporal distribution over the past 30,000 or fewer years, especially the last 10,000 years, and on the geographical distribution of the known sites that have produced local faunules. These chapters are usually supported by extensive tables listing the sites, their archeological context if any, radiocarbon dates, and taxa recovered. Often the taxa are assembled as faunas for particular swatches of Holocene time and these observed faunal changes over time used for paleoclimatic reconstructions.

Semken and C. R. Falk's chapter "Late Pleistocene/Holocene mammalian faunas and environmental changes on the northern plains of the United States" (pp. 176–313) is an extensive treatment of present and past loci of sympatry for small faunules of ten or so micromammalian taxa, showing the generally northern shift of the areas of sympatry from Pleistocene-Holocene boundary times to today or the separation of the now-western montane from the now-eastern woodlands taxa as the plains became drier as the Holocene progressed. Other papers give similar treatments but not as broadly, often because they treat smaller geographic areas. Maps showing the areas of present-day faunal sympatry for an extinct local faunule are numerous and illustrate well the points made by the authors.

The book is well produced, easy to read, and well printed and bound, with an index of all localities. Most of the figures are line diagrams; the few half-tones are clear but not strongly printed.

This is not a work that may be read at a sitting but one to be consulted or dipped into. It brings together many scattered records and places them in environmental and faunal perspectives. It is thus a "Handbuch" or compendium that summarizes much of the present knowledge of Holocene faunas and environments for the central plains of