

1 March 1985 • Vol. 227 • 4690

\$2.50

SCIENCE

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

Gordon Research Conferences

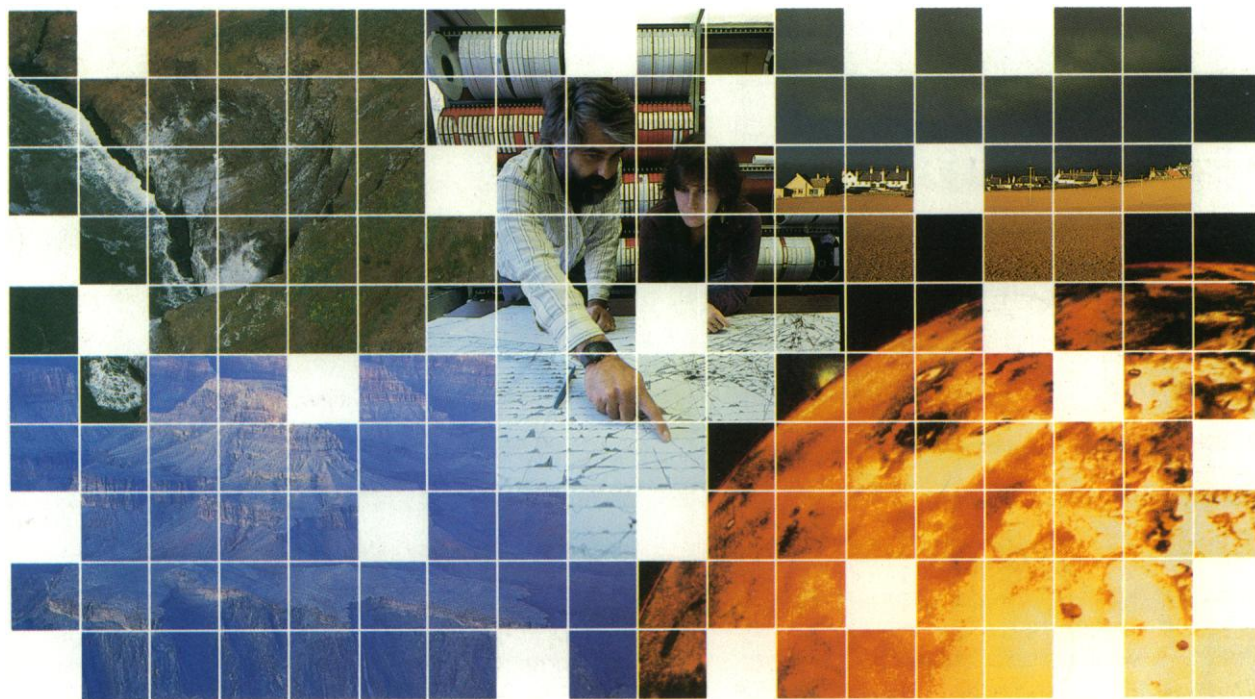
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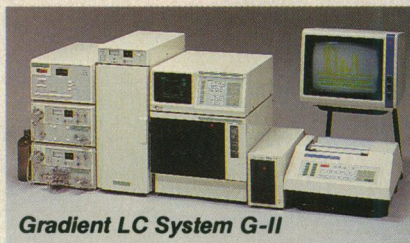


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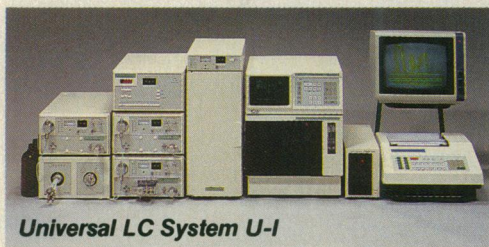
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Gradient LC System G-II

Gradient

- Complete automation of binary gradient LC



Universal LC System U-I

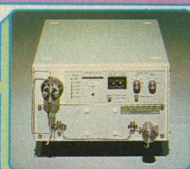
Universal

- Complete automation of ternary gradient LC as well as low and high pressure valve control



UV Spectrophotometric Detector SPD-6A, UV-VIS Spectrophotometric Detector SPD-6AV

- SPD-6A has wavelength range of 195 – 350nm and SPD-6AV of 195 – 700nm



System Controller SCL-6A

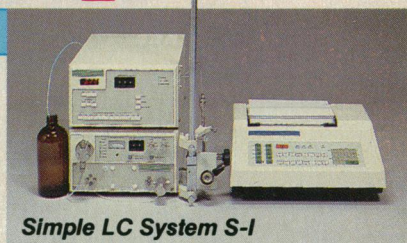
- Complete control of LC module as well as external devices
- Menu driven control of parameters

High Performance Liquid Pump LC-6A

- Capable of stable flow rate between 0.01 – 9.9ml/min

Simple

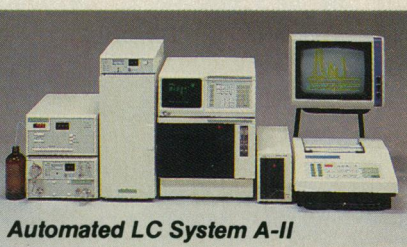
- Simple and low cost yet high performance



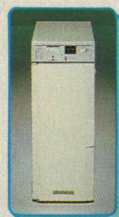
Simple LC System S-I

Automated

- Complete automation of isocratic LC

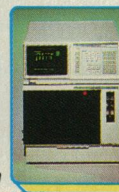


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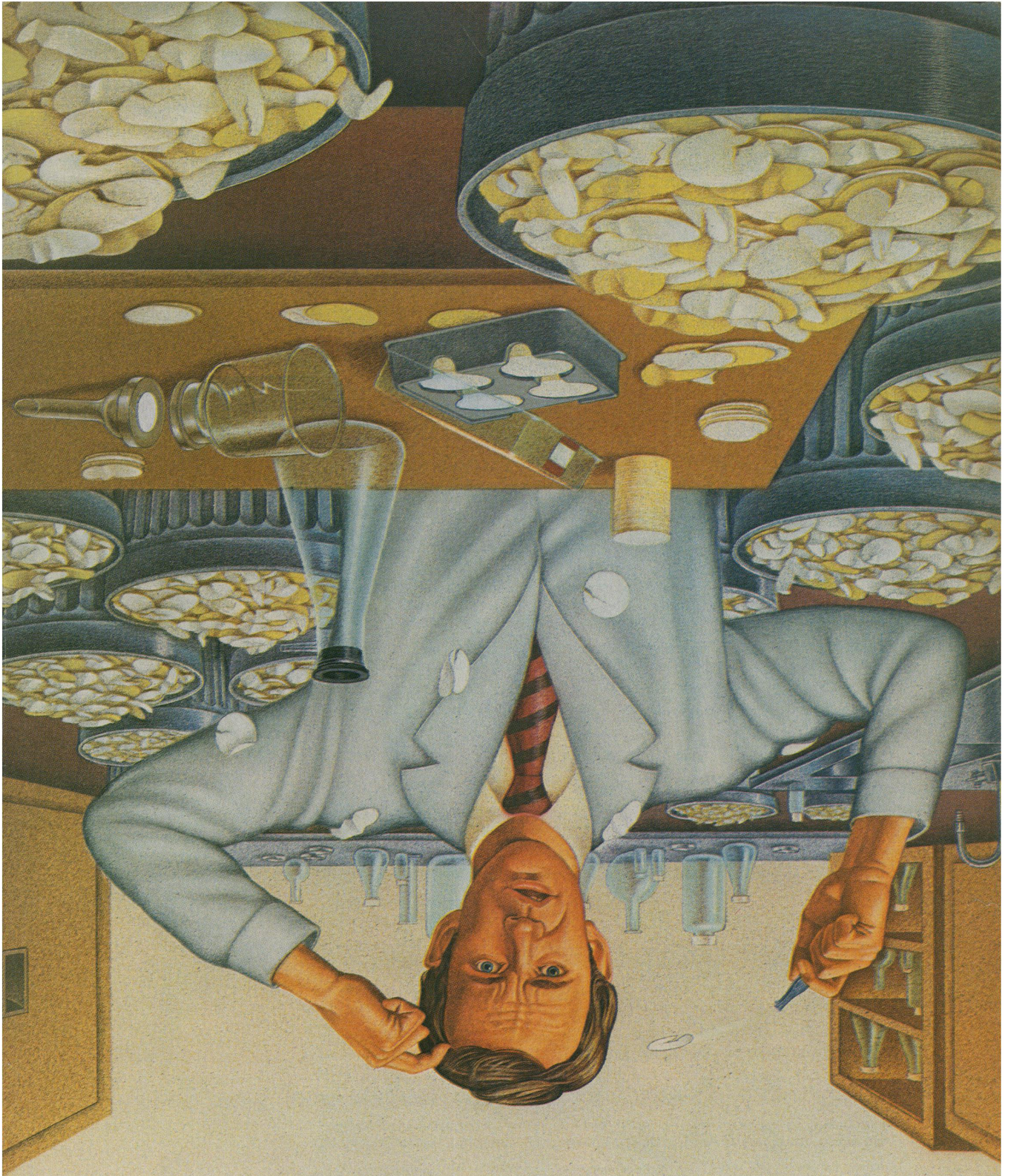
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The American Association for the Advancement of Science was founded in 1848 and incorporated in 1874. Its objects are to further the work of scientists, to facilitate cooperation among them, to foster scientific freedom and responsibility, to prove the effectiveness of science in the promotion of human welfare, and to increase public understanding and appreciation of the importance and promise of the methods of science in human progress.

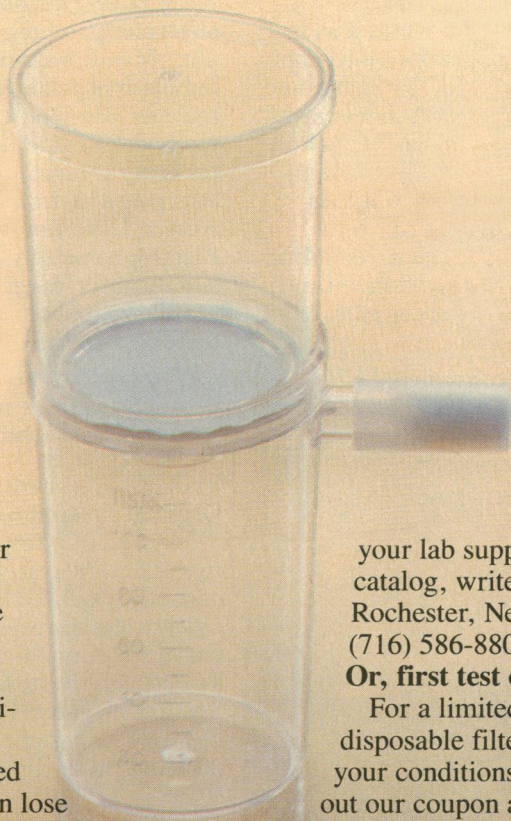
COVER

Lake Sunapee, New Hampshire, vicinity in which Gordon Research Conferences will take place (summer of 1985). See page 1067 for details about the conferences. [Photo courtesy of the State of New Hampshire]

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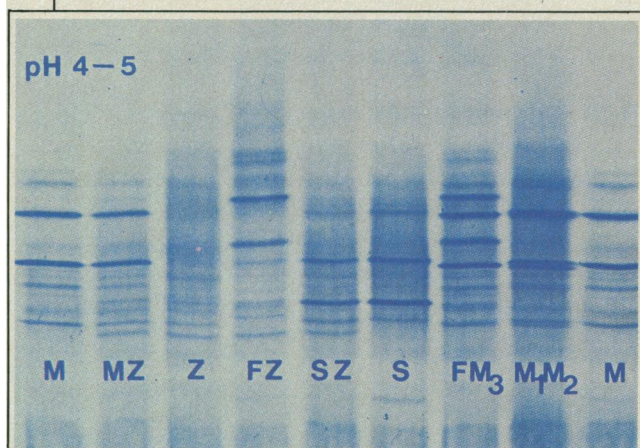
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LKB UltraMould casts bubble-free ultrathin gels in only 30 seconds, making gel casting quicker, easier and more certain ►



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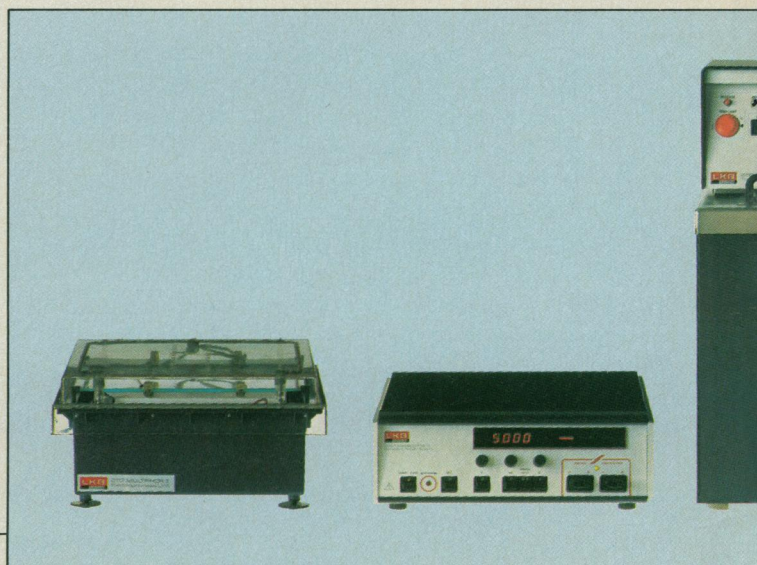
This is one in a series of advertisements describing the unrivalled versatility of the LKB Horizontal Electrophoresis System. For further information about analytical electrofocusing, and the many other applications of the system, send today for our brochure.

THE LKB SYSTEM

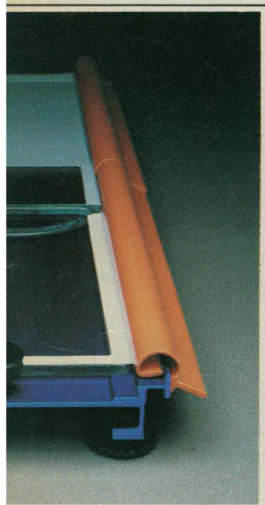
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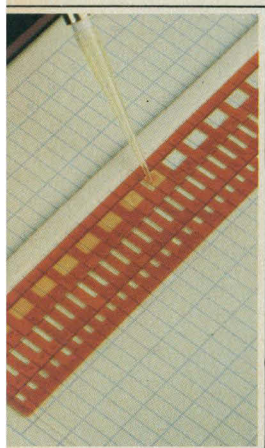
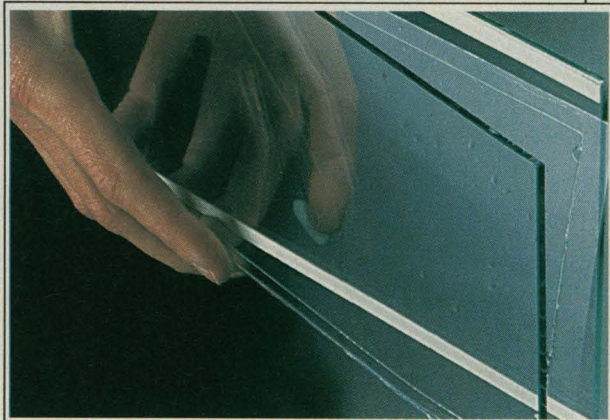


Electrophoresis System do you also get... analytical electrofocusing



AGAROSE GELS FOR MAXIMUM POROSITY
Another of the many options available to the user of the LKB Horizontal Electrophoresis System is the application of Agarose electrofocusing gels. LKB supplies extremely pure agaroses, carefully developed for electrofocusing, and the original capillary casting method simplifies the task of producing 0.5 mm gels on GelBond Film backing sheets. Agarose is non-toxic and easy to handle and the entire analysis procedure, including casting and running, is very rapid.

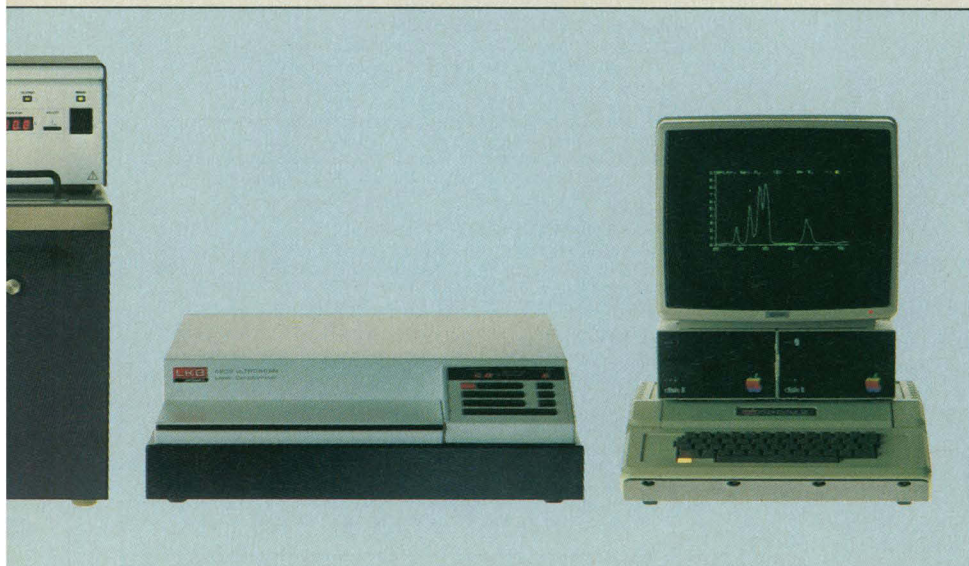
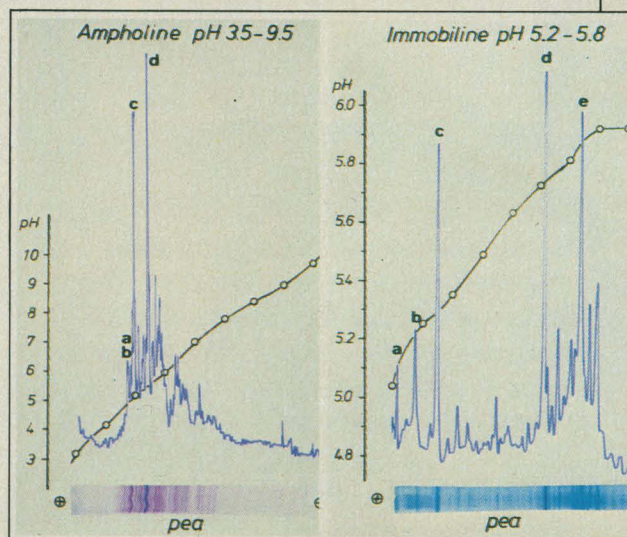
Separating the GelBond Film from the glass plate gives a 0.5 mm agarose gel, firmly attached to its support and ready to use ►



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Comparison of traditional electrofocusing and LKB Immobiline System (courtesy of Dr A Görg et al, Technische Universität, München) ►



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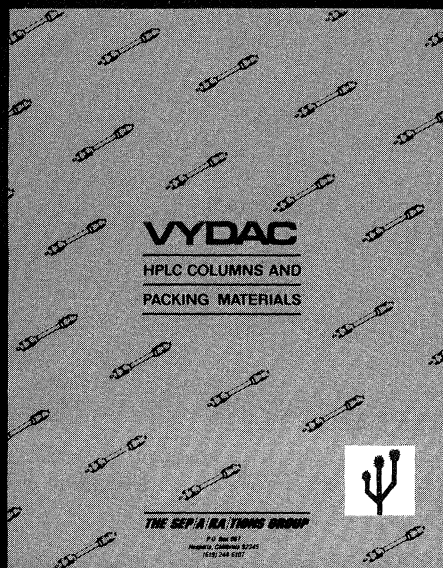
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Plenary Sessions

TISSUE CULTURE: REGENERATION EVENTS

Chair: KEITH WALKER, Plant Genetics, Inc.

Speakers: DWIGHT TOMES, Pioneer Hi-Bred International, Inc., Opportunities and limitations of the genotypic influence on establishment and plant regeneration from callus and cell cultures of crop species; TOM HODGES, Purdue University, Regeneration of maize; DAVID STUART, Plant Genetics, Inc., Physiology of development in regenerating cell cultures of alfalfa and celery; JAMES DUNWELL, John Innes Institute, Embryogenesis from pollen *in vitro*

TISSUE CULTURE: GENETIC EVENTS

Chair: Otto Schieder, Free University, Berlin

Speakers: WILLIAM SCOWCROFT, CSIRO, Canberra, Somaclonal variation: Impact on plant biology and breeding strategies; EDWARD COCKING, University of Nottingham, Somatic hybridization: Implications for agriculture; DÉNES DUDITS, Institute of Genetics, Szeged, Partial transfer of the nuclear genome by protoplast fusion and uptake of isolated chromosomes; MAUREEN HANSON, Cornell University, Organelle segregation and recombination following protoplast fusion

TISSUE CULTURE: LARGE SCALE

Chair: Michael Shuler, Cornell University

Speakers: PETER STEPONKUS, Cornell University, Fundamental aspects of chrysoinjury as related to chrysoinjury; PHILIP AMMIRATO, Columbia University and DNA Plant Technology Corp., Strategies for large-scale manipulation of somatic embryos in suspension cultures; DONALD DOUGALL, University of Tennessee, Chemicals from plant cell cultures: Yields and variation; MICHAEL SHULER, Cornell University, Bioreactor consideration for chemical production from plant cell tissue culture; MAMORU TABATA, Kyoto University, Production of shikonin by plant cell cultures

PLANT TRANSFORMATION

Chair: ROBERT FRALEY, Monsanto Co.

Speakers: ROBERT FRALEY, Monsanto Co., Perspectives on plant transformation: Research and commercial applications; BRUNO GRONENBORN, Max-Planck Institute, Cologne, Development of CaMV-based plant transformation vectors; STEPHEN ROGERS, Monsanto Co., Expression of introduced genes in transformed plants; NAM-HAI CHUA, Rockefeller University, DNA sequences involved in the constitutive and regulated expression of plant genes; JOZEF SCHELL, Max-Planck Institute, Cologne, New developments in plant transformation technology: Its application to monocots and cellular organelles

GENES FOR TRANSFORMATION

Chair: BEN BURR, Brookhaven National Laboratory

Speakers: RICHARD BROGLIE, Rockefeller University, Regulation of chitinase gene expression by ethylene in response to plant stress; JUNE NASRALLAH, Cornell University, Self-incompatibility alleles of *Brassica*; STEVEN DELLAPORTA, Cold Spring Harbor Laboratory, The use of transposon tagging to isolate genes from maize; ROGER BEACHY, Washington University, Application of gene transfer technology to the study of viral pathogenesis and induced immunity

PLANT MOLECULAR BIOLOGY AND AGRICHEMICALS

Chair: ROBERT GOODMAN, Calgene, Inc.

Speakers: ROBERT GOODMAN, Calgene, Inc., Strategies and issues in the application of genetic engineering to future uses of agrichemicals; DALE SHANER, American Cyanamid Co., Mechanism of action of the imidazolinones and cell culture selection of tolerant corn; LAURENS METS, University of Chicago, Prospects for genetic modification for resistance in plants to triazine herbicides; CARL FALCO, E. I. du Pont de Nemours & Co., Molecular genetics of sulfonyl urea herbicide activity; WILLIAM HIATT, Calgene, Inc., Expression in plants of a bacterial gene encoding resistance to the herbicide glyphosate

Panel Discussions

PLANT MOLECULAR BIOLOGY AND PLANT BREEDING

Conveners: VERNON GRACEN, Cornell University; VIRGINIA WALBOT, Stanford University
Panel Members: TED BINGHAM, University of Wisconsin; PETER DAY, Plant Breeding Institute, Cambridge; JOHN GAEDLMAN, University of Minnesota; STEVE TANKSLEY, New Mexico State University; ARTHUR WEISSINGER, Pioneer Hi-Bred International, Inc.

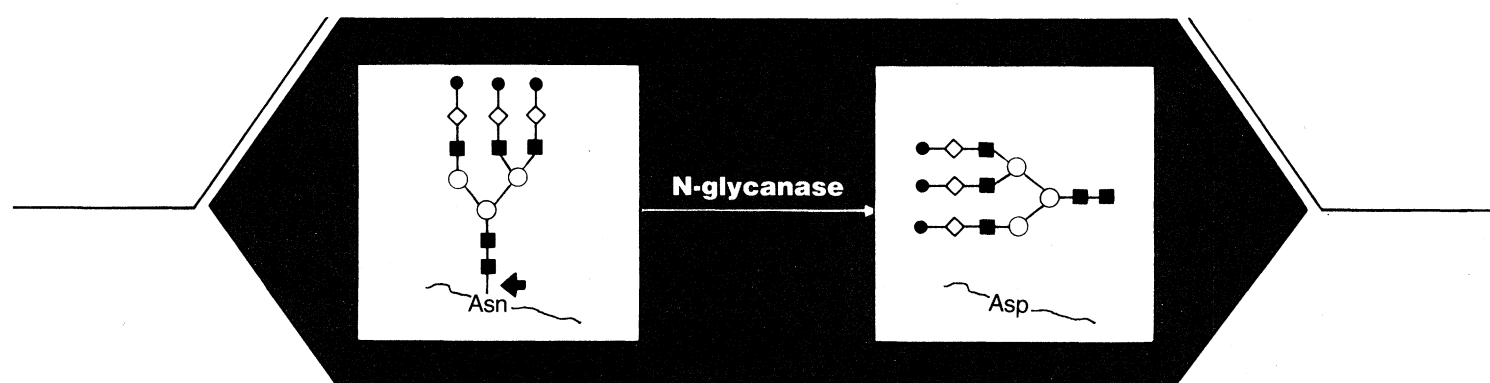
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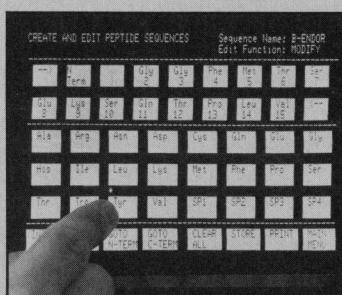
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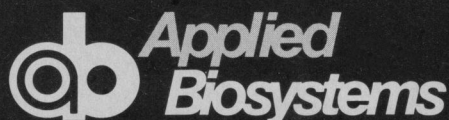
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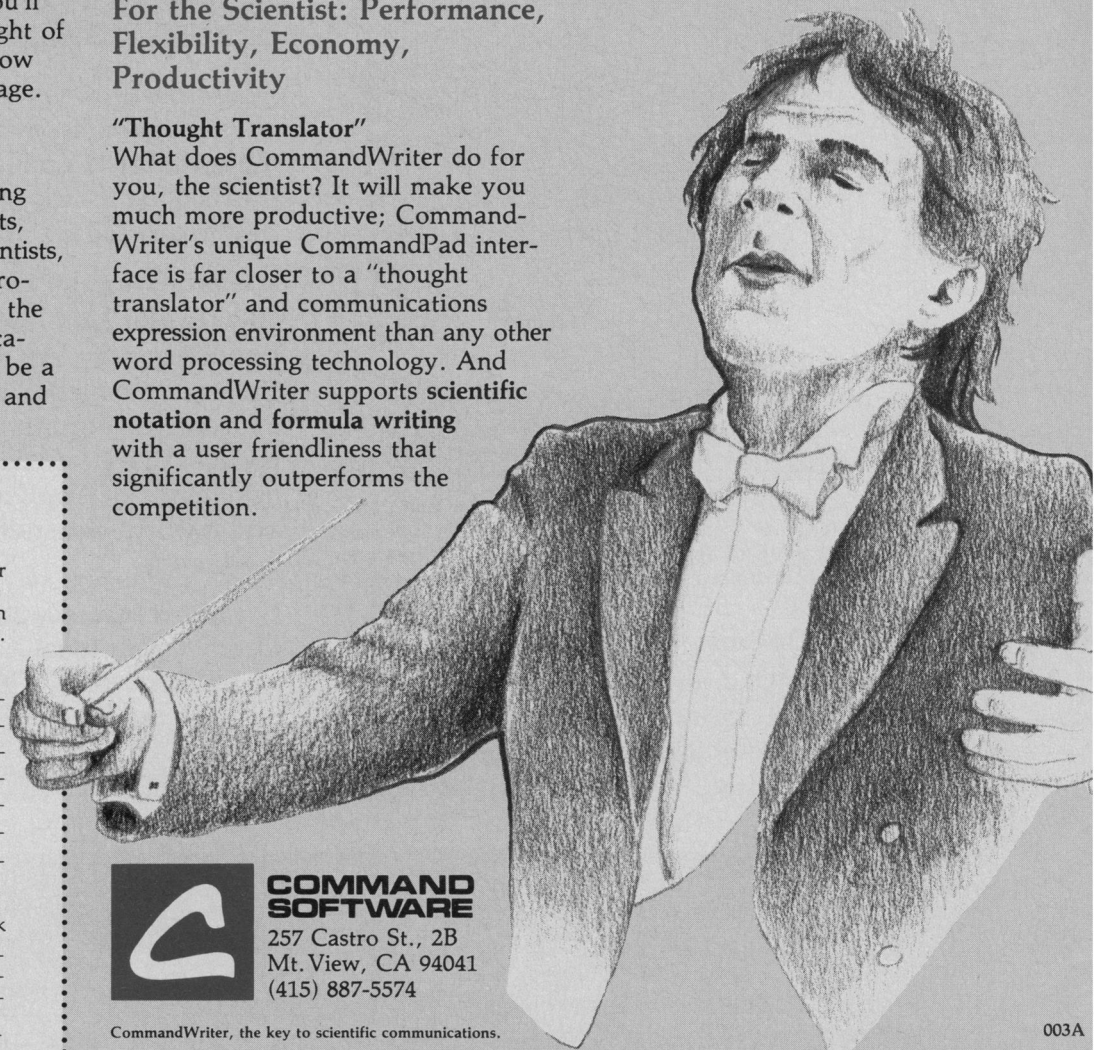
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established. We are informed by the then-director of the major adoption agency that adoptive parents were not told of the existence of any sibling to the child they had adopted" (4). It seems clear that there was no correlation in rearing SES, adoptive fathers' income, or neighborhood for the members of the sibling pairs. They were placed independently. Thus Moses' concern is without empirical basis.

Moses raises one final point: in analyses which stretch over several generations he fears that changes in conviction rates over the years might produce artifactual correlations between convictions of the adoptees and the biological and adoptive parents. It is also true that during this timespan this area of the world was faced with the Great Depression, World War II, and industrialization. It is conceivable that the influence of genetic factors might interact with or be affected by these social upheavals as well as the changes in conviction rates. We examined this possibility in an earlier publication (6). The analyses reported for the entire cohort were repeated for each of five shorter intervals: 1924-1928, 1929-1933, 1934-1938, 1939-1943, and 1944-1947. "The results were virtually identical for all of these periods and virtually identical to the analyses of the total sample. The changes across these years did not interact with the relationships between biological parent and adoptee crime" (6).

As in any area of science, this research project does not stand or fall alone. What is ultimately most important about a research result is its replicability. There is a considerable literature on the genetics of antisocial behavior (7).

1) Eleven twin studies from 1929 to the present have uniformly shown much higher rates of concordance for convictions or arrests for identical than for fraternal twins. Christiansen, in a study of a total population of twins ($n = 3586$ pairs), found 52 percent concordance for criminal convictions for identical (male-male) pairs and 22 percent concordance for (male-male) fraternal twin pairs (8).

2) Two U.S. adoption studies show concordance between crime in biological parents and crime in their adopted-away offspring (9). An investigation of crime in a major Swedish adoptee cohort (10) yields findings that agree with ours in just about every detail. These authors point out that "there are no genes for criminality, but only genes coding for structural proteins and enzymes that influence metabolic, hormonal, and other

physiological processes, which may indirectly modify the risk of 'criminal' behavior in particular environments."

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7. S. A. Mednick et al., in *Human Development: An Interactional Perspective*, D. Magnusson and V. Allen, Eds. (Academic Press, New York, 1983).
8. K. O. Christiansen, in *Biosocial Bases of Criminal Behavior*, S. A. Mednick and K. O. Christiansen, Eds. (Gardner, New York, 1977).
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Jumping Frog Genes

In the article "Frog genes jump species" (Research News, 23 Nov., p. 955), Roger Lewin describes the second and more likely origin of the *Rana ridibunda* individuals with mitochondrial DNA of an *R. lessonae* type as being a cross between an *R. lessonae* female and an *R. ridibunda* male. However, this cross would produce an *R. esculenta* hybrid, as described previously in the article. The original authors refer (1) to a cross between an *R. esculenta* female and an *R. ridibunda* male.

BILL MACDONALD

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Erratum: In the report "Antibodies to peptides detect new hepatitis B antigen: Serological correlation with hepatocellular carcinoma" by A. M. Moriarty, H. Alexander, G. B. Thornton, and R. A. Lerner (25 Jan., p. 429), the legend of table 1 should have begun, "Reactivity of human serum samples with peptide 99 and peptide 142," not "Reactivity of human liver samples. . . ."

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This budget reflects a particular world view: essentially that the nation faces tough economic competition and that our competitors are challenging our research preeminence in important fields. In response we must do whatever is necessary to maintain—and, where possible, to improve—the ability of our universities to do basic research in the most important areas.

This world view and NSF's general responsibility for the health of basic science and engineering led us to three major priorities: (i) programs that are most directly related to economic competitiveness, (ii) science and engineering infrastructure, and (iii) disciplines for which NSF has a special responsibility.

We are seeking a substantial increase for engineering, which will be allocated \$170 million, up 13 percent. Much of this will be concentrated in engineering research centers, which will contribute directly to the research and personnel base that American industry needs to compete in world markets. For similar reasons, we also seek significant increases in biotechnology, earth sciences, and advanced materials research.

Infrastructure is the people, equipment, and instrumentation that are available for research. The people are by far the most important, so in science and engineering education we are emphasizing stability and the orderly rebuilding of quality programs. The budget is constant at \$82 million. Graduate students and postdoctoral fellows supported on research funds will rise 4 percent to more than 14,000.

We will continue major support for equipment and instrumentation: a total of \$271 million, up 13 percent. We will also continue the priority established in 1984 to provide access to supercomputers for academic researchers. In 1986 this will take almost \$46 million, a 12 percent increase, but will provide opportunities to study entirely new classes of problems.

Finally, we are providing strong support for basic research, with emphasis on disciplines for which NSF has special responsibility because it is the major source of federal support. This category includes core mathematics, environmental biology, and social and economic sciences. All these receive substantial increases.

These increases will require decreases elsewhere. We have proposed them in areas no longer quite so timely or productive, or which should attract other support. These occur throughout NSF.

In addition to the quantitative changes, some things will be qualitatively different in 1986. We are continuing a strong effort to increase cooperation between universities and industry. This is especially true in several programs: engineering research centers, presidential young investigators, and science and engineering education.

We are also emphasizing large-scale coordinated research a bit more than in the past, although 70 percent of the funds in the research directorates will continue to go to individual investigators; this compares with an average of 73 percent in recent years.

Economic competitiveness, cooperation, and infrastructure are thus the major themes for NSF in 1986. In addressing them we continue to strengthen our research universities, which are ultimately our greatest resource in science and engineering. These are the right priorities for these times, and we can do well by them even with an austere budget.—ERICH BLOCH, *Director, National Science Foundation, Washington, D.C. 20550*

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