American Association for the Advancement of Science

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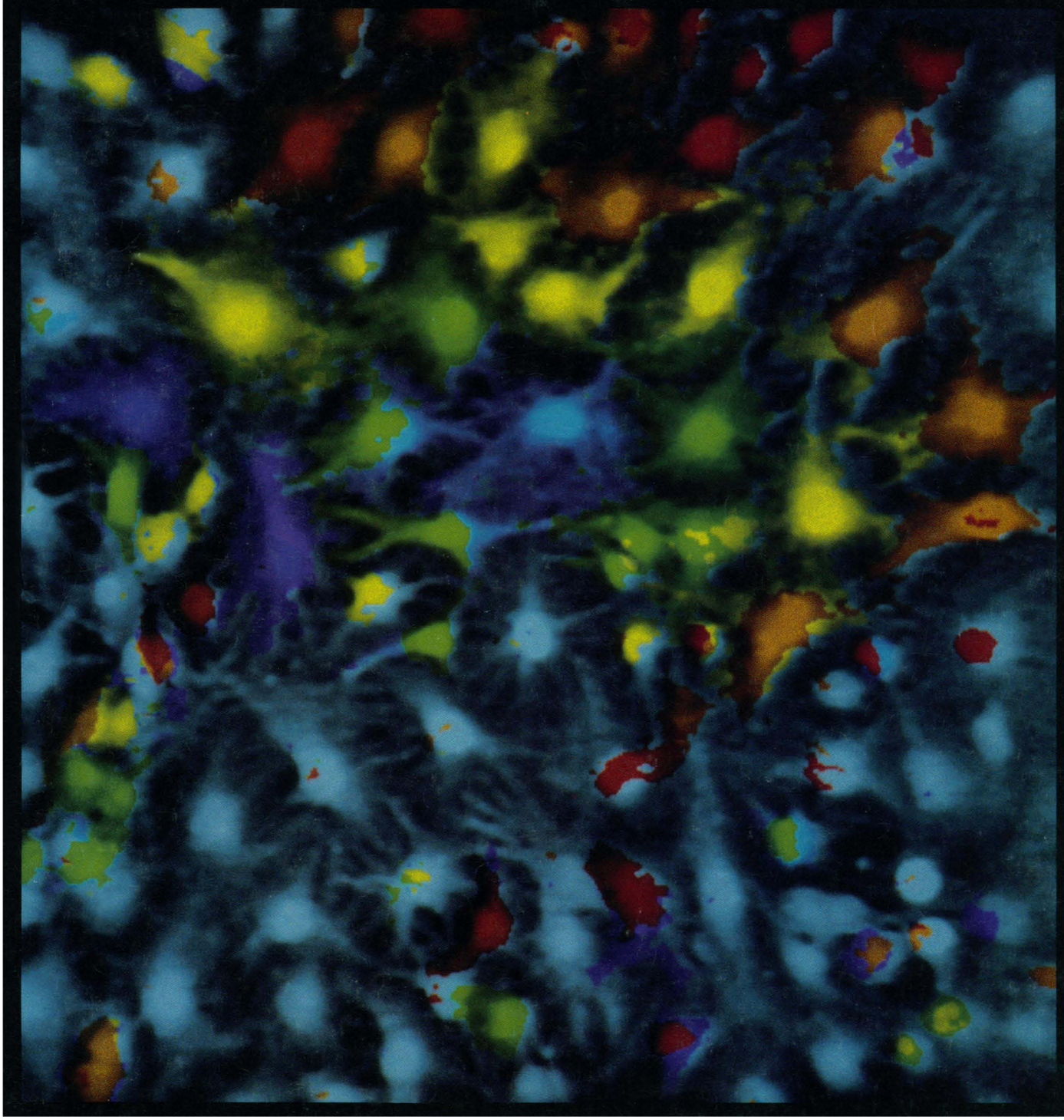

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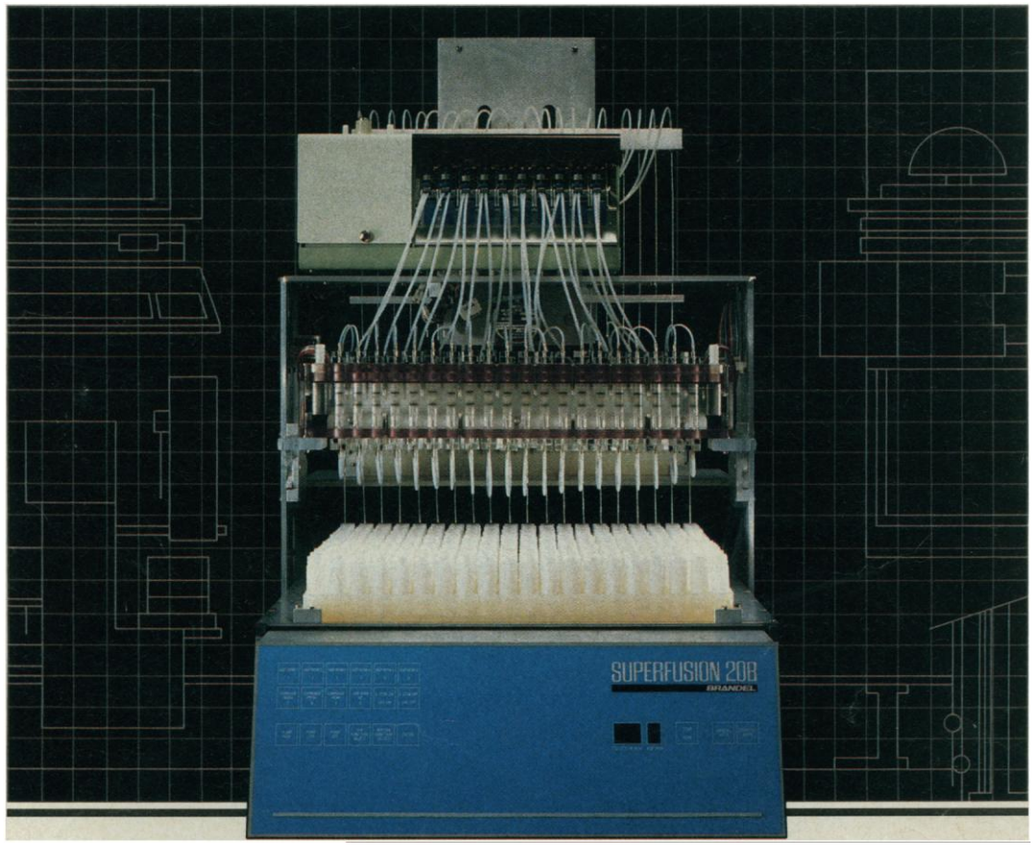

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COVER A wave of increased cytosolic calcium concentration propagates from cell to cell through a confluent culture of hippocampal astrocytes. The wave, induced by glutamate and measured with fluo-3, is evident from the spatial progression of color overlay areas (in a spectral sequence from violet to red). Each color indicates an area of calcium elevation at one of seven successive 4-second intervals. See p. 474. [Digital fluorescence micrograph courtesy of Ann H. Cornell-Bell, Steven M. Finkbeiner, Mark S. Cooper, and Stephen J. Smith]

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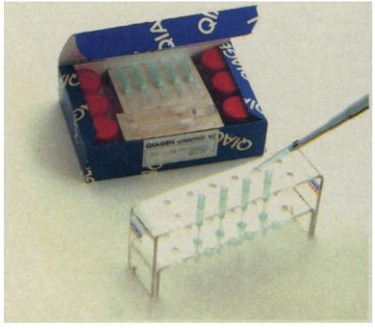

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Malaria stalemate

CURES and vaccines for malaria have been elusive, and the optimism of public health officials in the mid-1980s, when much was being discovered about the structure and behavior of the malaria parasites, has all but vanished. Today 100 million people, mostly but not exclusively in the tropics, have malaria, and the parasites are becoming resistant to quinine-based drugs that for years helped to keep the disease in check. In three articles, Marshall and Cherfas (page 399) describe the combined approach that has been taken toward controlling malaria—one that has included development of vaccines, genetically engineered mosquitoes, and pharmaceuticals and use of insecticides and physical traps for catching mosquitoes—and explain how this approach has nonetheless failed to significantly improve the global malaria situation. As future efforts are planned, one of the continuing dilemmas will be to determine how best to spend the limited available funds (less than the total U.S. AIDS budget), whether for quick fixes like training health care workers to deal with symptoms or for research that might yield longer term solutions.

Plant pigmentation

THE scarlets, purples, mauves, and blues of flowers, fruits, and leaves of higher plants are caused by plant pigments called anthocyanins. When, where, and how intensely these colors are expressed in maize plants are determined by *R* gene products. One *R* gene, called *Lc*, was fused to a promoter and inserted into a vector; gold microprojectiles were then coated with the vector and shot into maize cells (page 449). Various maize tissues that normally are not pigmented by *Lc* became brightly colored, and therefore individual cells in which *Lc* was expressed could be directly identified. The experiments support the hypothesis of Ludwig *et al.* that promoters of *R* genes are important determiners of pigmentation patterns. Functional domains of the *R* gene product, which is believed to regulate genes for various enzymes in pigmentation pathways, can now be studied. In addition, because the *R* gene product induces pigmentation, stably transformed cell lineages can be identified directly and noninvasively.

Blocking AIDS virus replication

A synthetic peptide-like compound called U-81749 blocks the activity of an important enzyme of HIV-1, the AIDS virus (page 454). As a consequence, HIV-1 particles do not mature inside infected blood cells and virus replication stops. Although the effects of U-81749 are partially reversible, it should be possible to adapt the design for the synthesis of a related compound that has irreversible inhibitory effects. Experiments by McQuade *et al.* show that activity of the HIV-1 protease can be blocked in vitro by U-81749. In addition, in a genetically engineered system in which HIV-1 genes are expressed by a different virus (vaccinia), exposure to U-81749 prevents the large precursor protein molecules for two gene products, gag and pol, from being processed; precursors accumulate in cells, and structural proteins of HIV-1, HIV-1 enzymes, and HIV-1 particles are not made.

Asthma blocker

SYMPTOMS of asthma might be prevented or lessened by blocking ICAM-1 molecules, which are found on the surfaces of cells of the bronchial endothelium and lung epithelial tissues; antibodies or pharmaceuticals might serve as the blocking agents. ICAM-1 molecules facilitate migration of immunoreactive cells into inflamed areas of the body; in vivo and in vitro experiments now show that ICAM-1 molecules are also instrumental in bringing eosinophils into inflamed bronchial airways (page 456). The eosinophils come in contact with ICAM-1–expressing lung tissues and produce soluble substances that cause tissue damage; their effects contribute to the hyperresponsiveness of the airways, which is a key feature in the pathology of asthma. Wegner *et al.* found that after monkeys had inhaled antigens that induced airway hyperactivity, ICAM-1 molecules were expressed in greater than normal amounts and eosinophils rapidly accumulated in airway passages; if the monkeys also received injections of antibodies specific for the ICAM-1 molecules, the influx of eosinophils was slowed and the hyperresponsiveness of the bronchi reduced. Because other respiratory diseases might similarly result from actions of ICAM-1 molecules, they too might be arrested with ICAM-1 blocking agents.

Electric field effects

DO the electric and magnetic fields that are produced by common household appliances, video displays, electric blankets, utility power lines, radar emitters, and other sources pose significant hazards to health? For several decades, the effects of very weak electric fields on living organisms have been debated, but work by Weaver and Astumian indicates that more serious study is warranted. They present a physical model that shows that electric field strengths can be extremely low and yet affect macromolecules in a cell's membrane (page 459). Two key variables that contribute to the exquisite sensitivity of cells to very weak signals are the breadth of the frequency window of the electric signal and the types of receptive molecules present in membranes; for example, certain enzymes undergo frequency-specific conformational changes that may in turn accelerate catalytic activity and biologic effects. Estimates of the smallest applied field to which cell membrane molecules can respond indicate that changes can be induced by fields with strengths so low that they appear to violate the thermal noise limit (which can randomize processes in cells). The importance of very weak electric fields cannot therefore be dismissed solely because background noise exists above the level of the field. ■ RUTH LEVY GUYER

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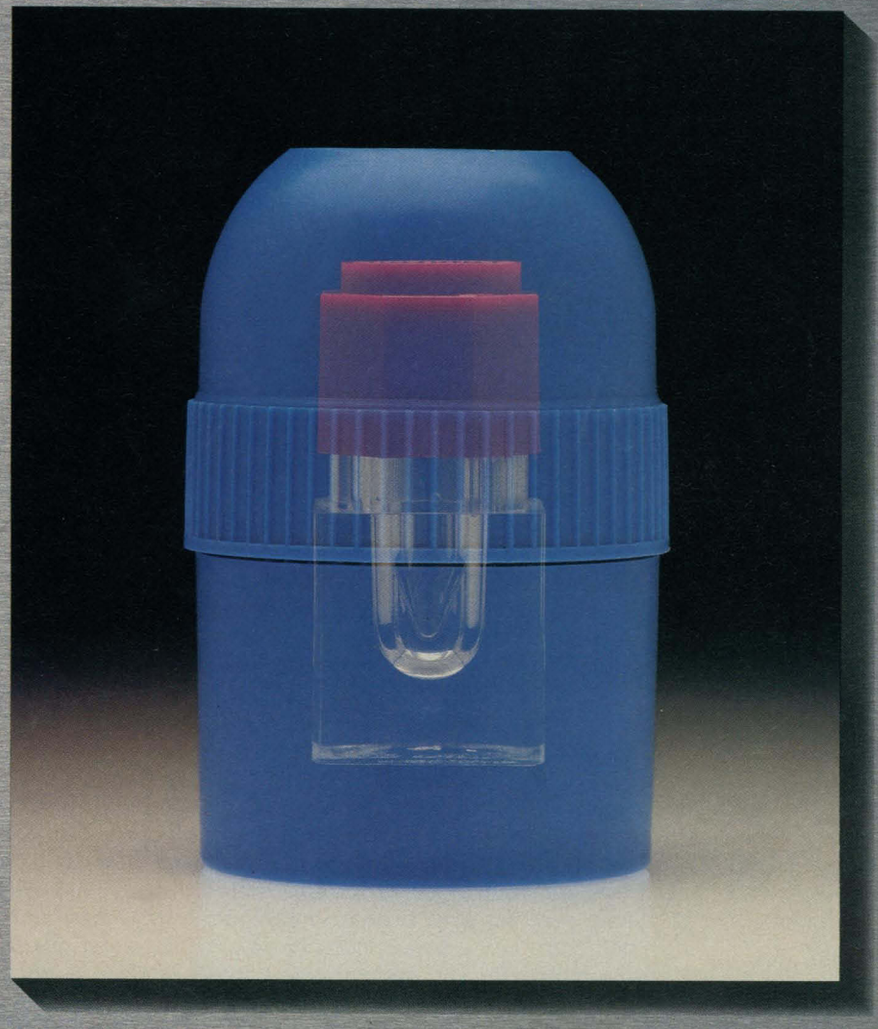

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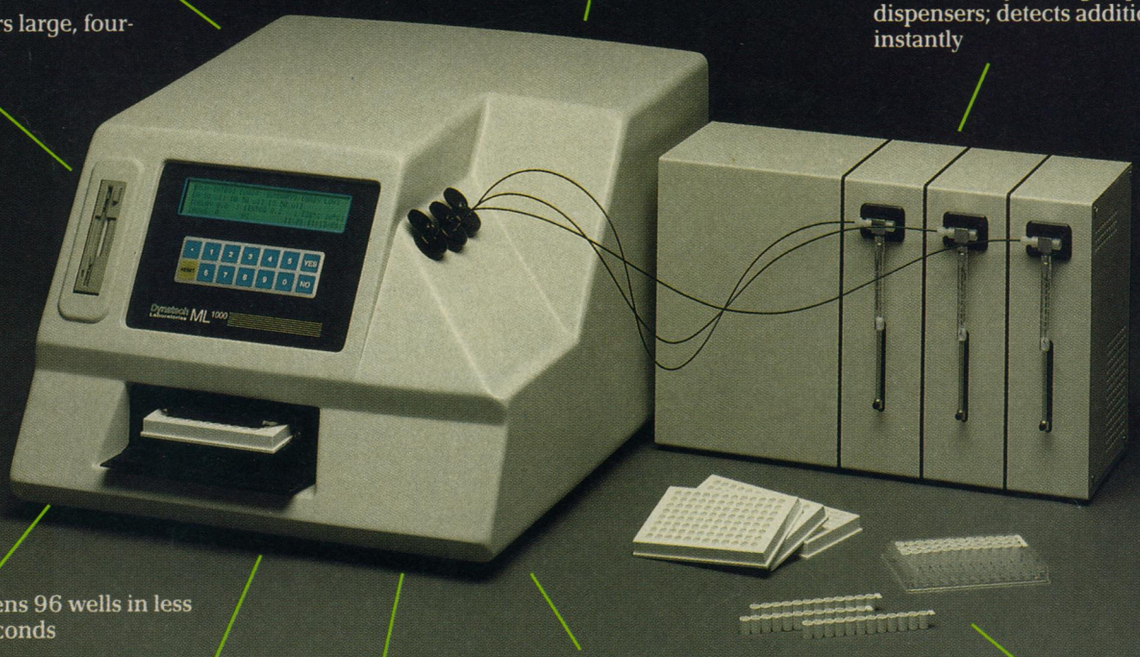

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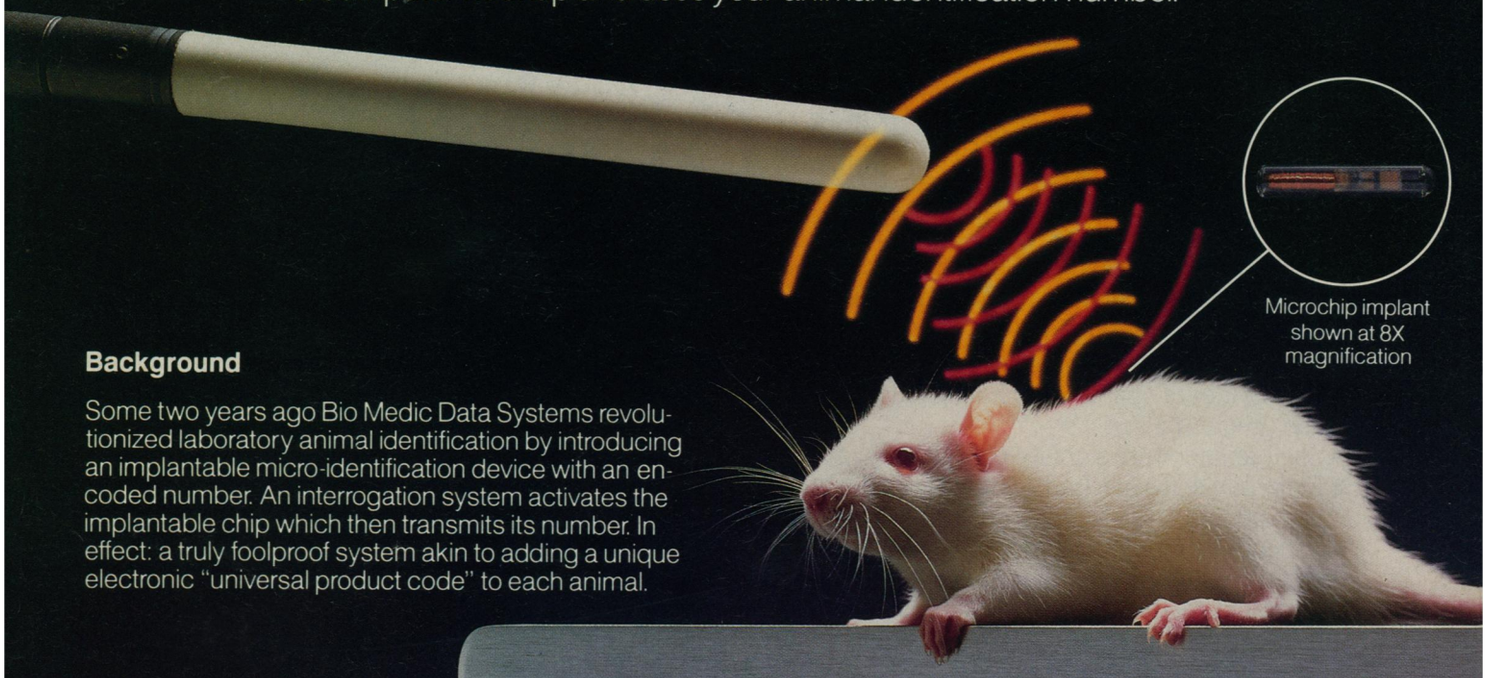
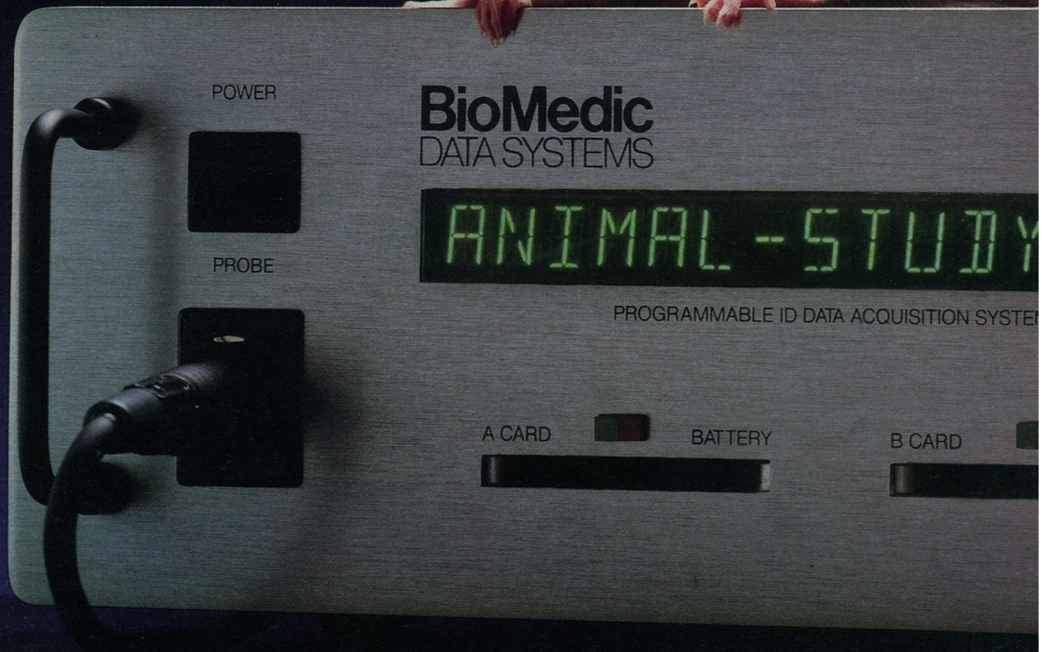


Background

Some two years ago Bio Medic Data Systems revolutionized laboratory animal identification by introducing an implantable micro-identification device with an encoded number. An interrogation system activates the implantable chip which then transmits its number. In effect: a truly foolproof system akin to adding a unique electronic "universal product code" to each animal.



What are the Benefits?

This simple system obsoletes the traditional ear punching or tagging, toe clipping, and tail tattooing. As such, the age-old labor intensive techniques—in terms of the initial identification, the subsequent reading, and the inevitable re-dos—are replaced by a simple, easy, humane and remarkably efficient system. (A dramatic example: 200 animals can be identified in about 45 minutes.)

In addition: the imprecision of the conventional methods is replaced by *positive animal identification.* Animal misidentification or infection can indeed by catastrophic should they delay, impede, or destroy a crucial investigation. This simple foolproof system now converts ear punching or tagging, toe clipping, and tail tattooing into unacceptable risks ... and who needs that when a positive animal identification system is now available!

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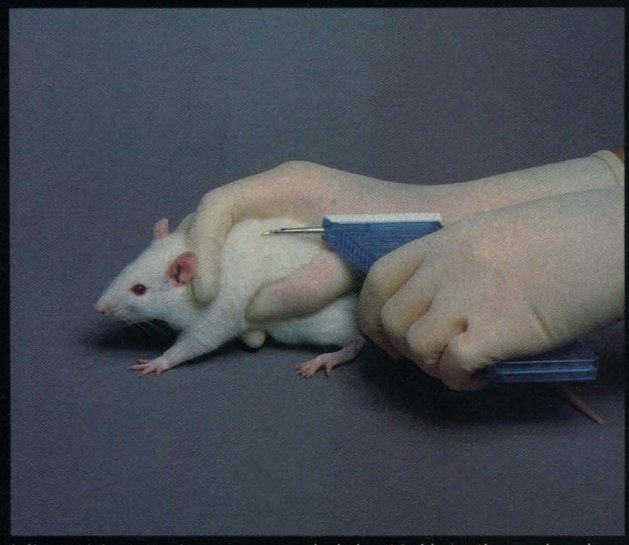

Microchip is subcutaneously injected into the animal.

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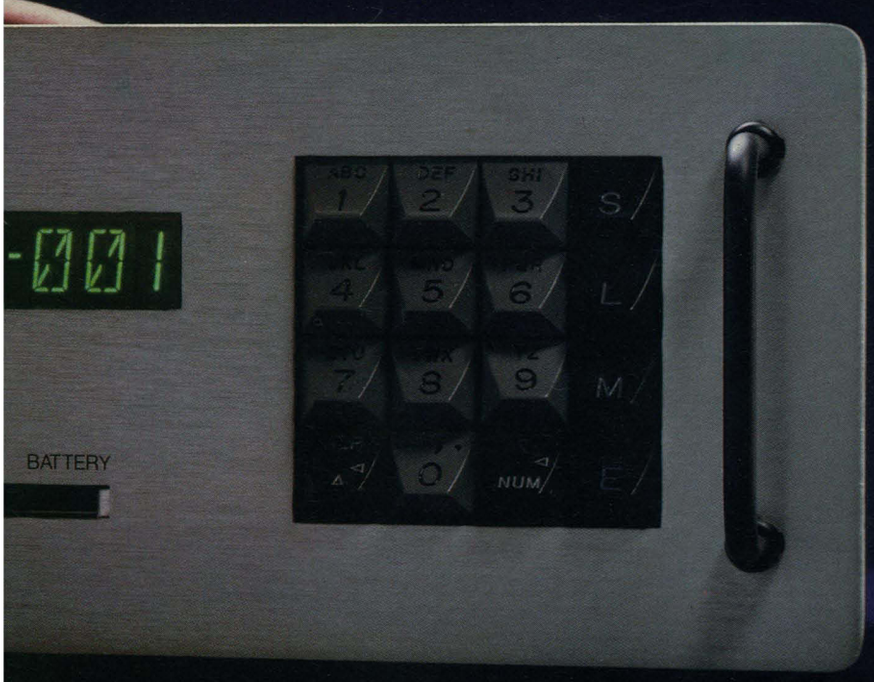

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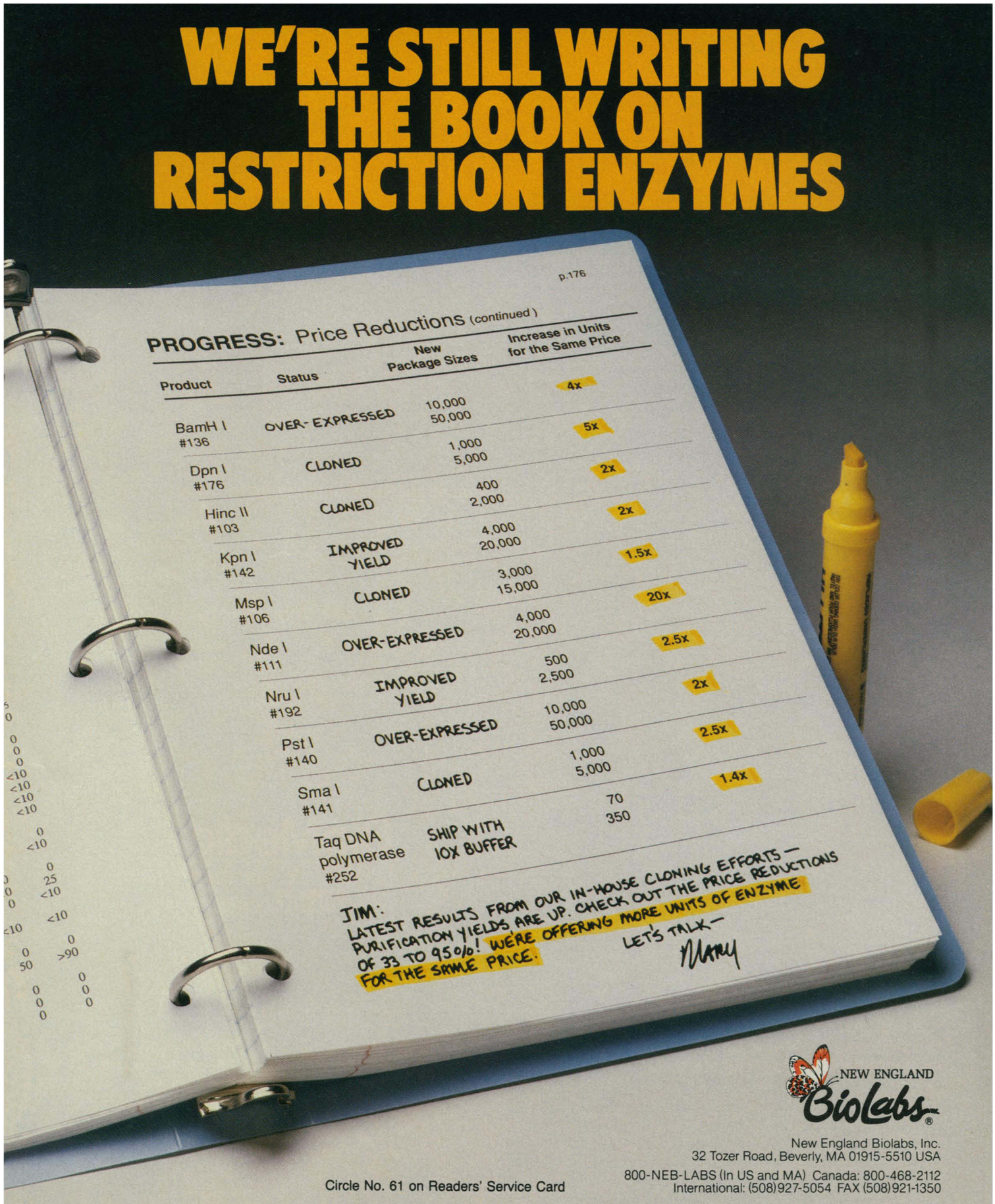

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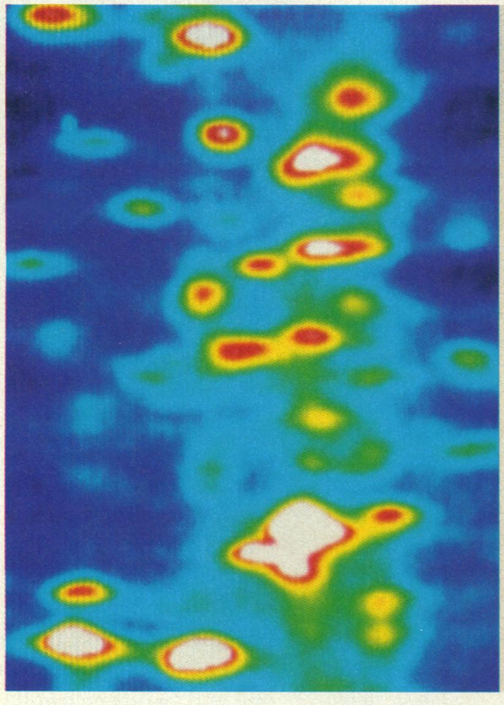

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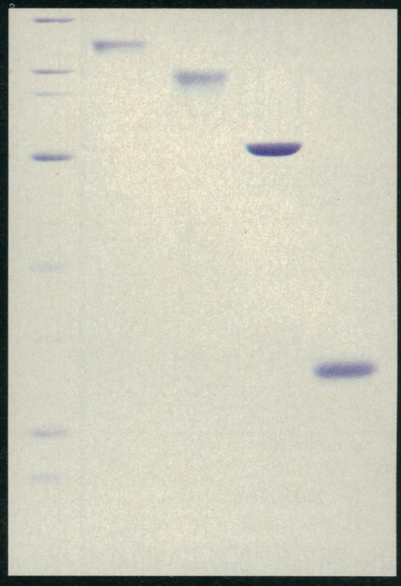

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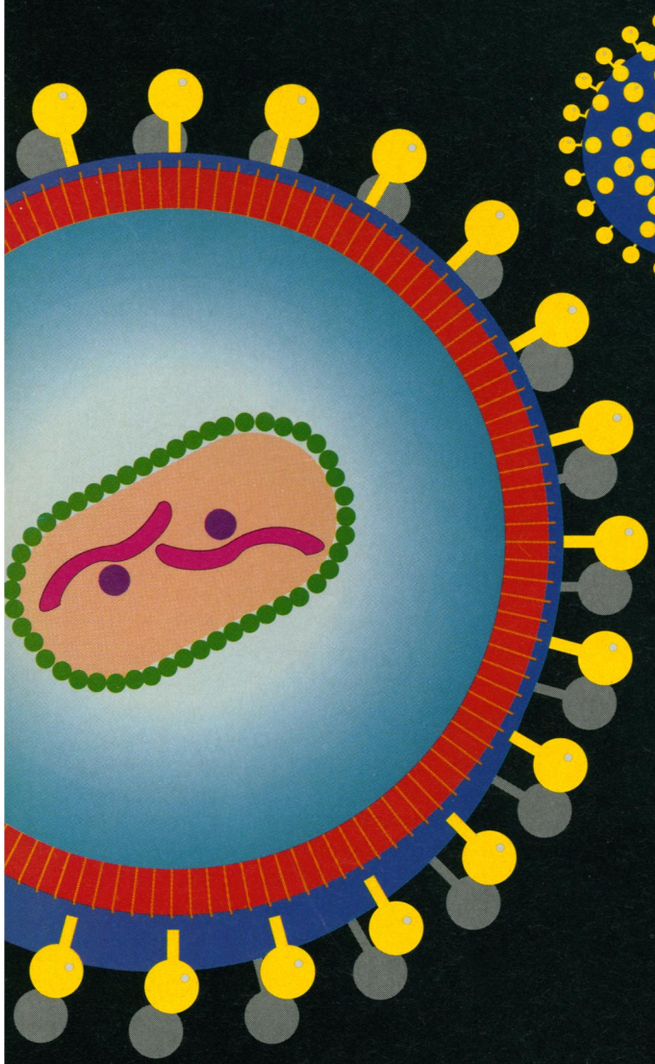

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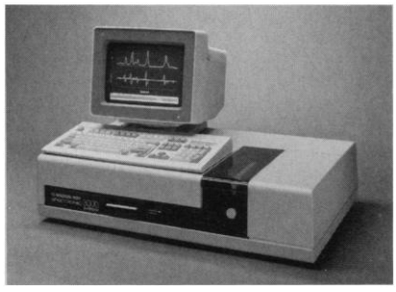

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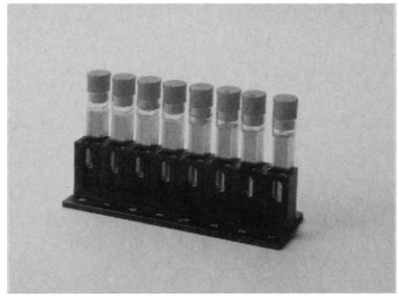
Scan up to eight samples at a time

In addition to the inherent speed of array technology, the SPECTRONIC 3000's Kwik-Stage™ sampling platform (which is standard) allows biotechnicians and other users to obtain automated scanning of up to eight samples in a single loading.



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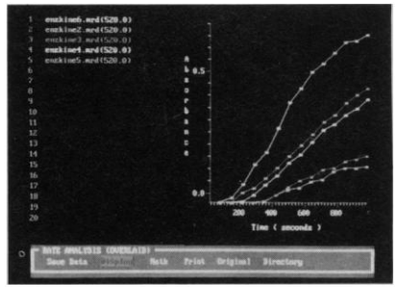

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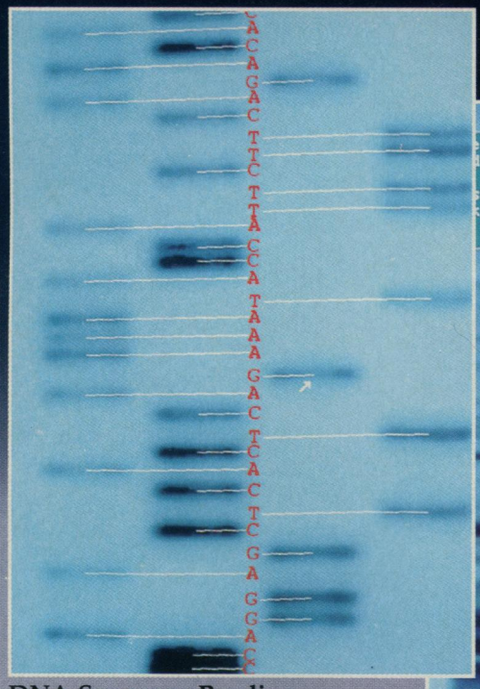
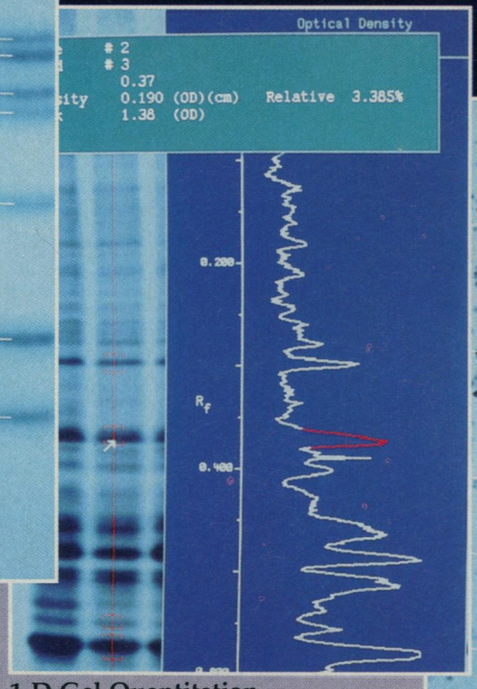
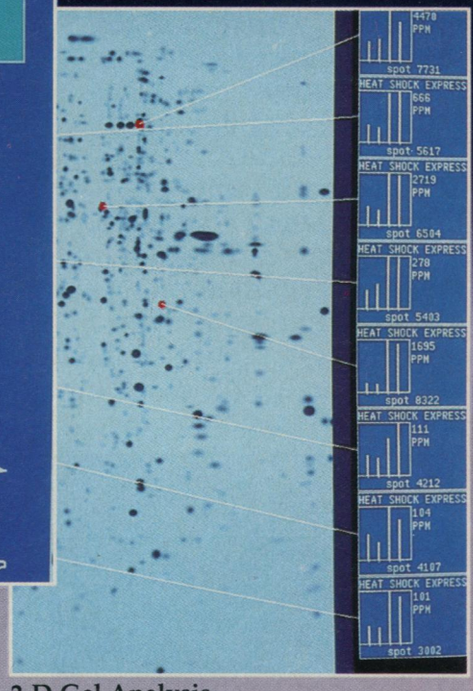


DNA Sequence Reading



1-D Gel Quantitation



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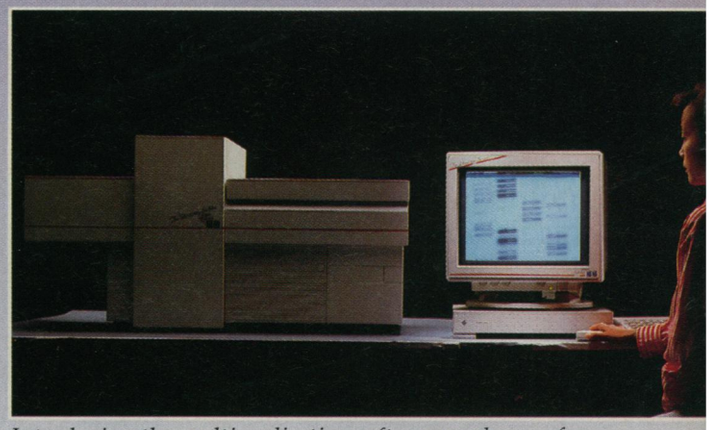

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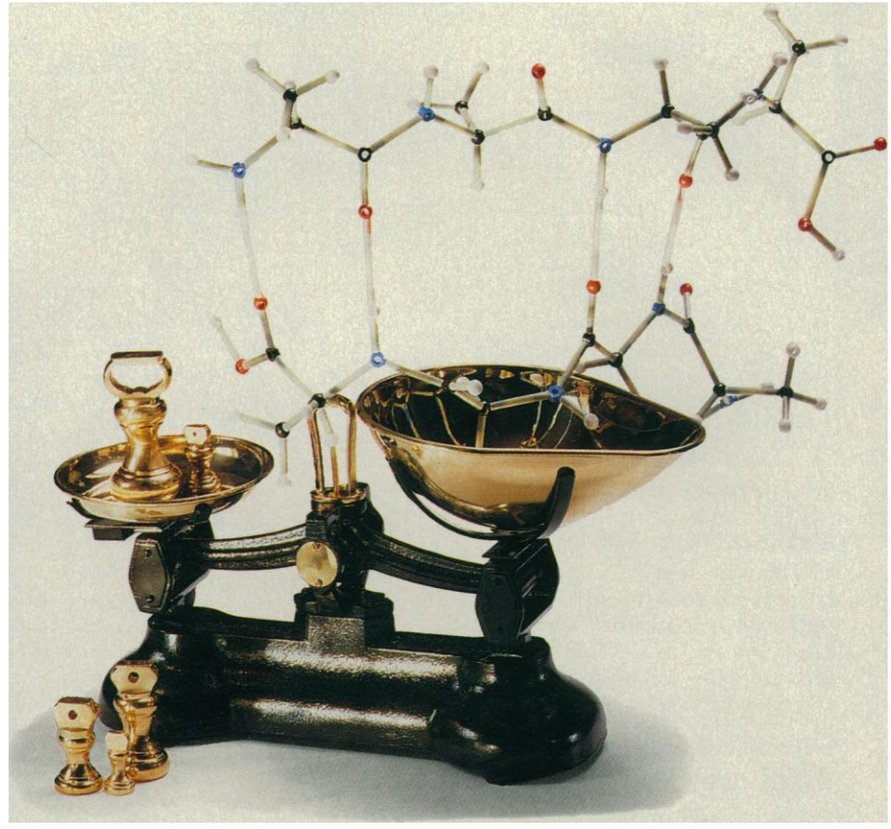

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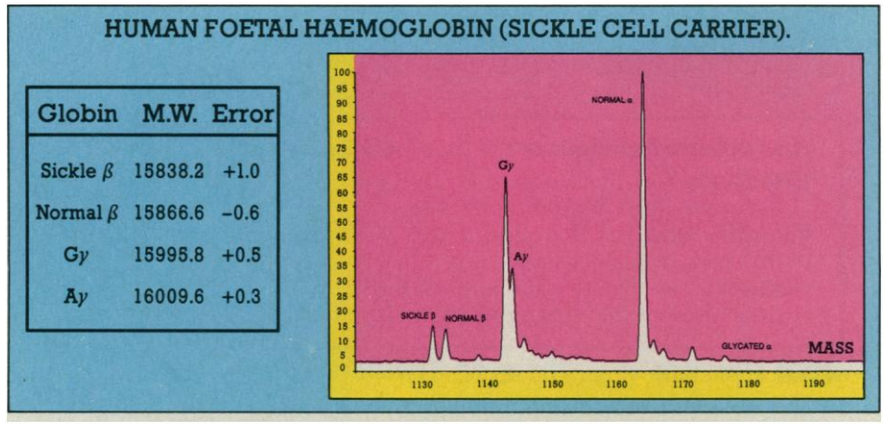

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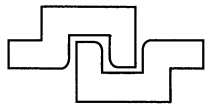

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Those wishing to organize and direct an ASI or an ARW, or participate in collaborative research should write for information and application forms to :

Scientific Affairs Division (Ref. 1990-1), NATO, B-1110 Brussels, Belgium

1990
Programme of meetings

The Advanced Study Institutes and Advanced Research Workshops to be held in 1990 are given in the following pages. **Each meeting is held under the responsibility of its director, to whom all requests for information, attendance or support should be addressed.** Participation or tuition fees are not required from participants, some of whom may obtain small grants from the meeting director to assist with travel and living expenses. Attendance at ASIs is open to all suitably-qualified applicants. Attendance at ARWs is usually by invitation only, but a few places are available for particularly well-qualified scientists upon application to the director.

Locations and dates noted in this list may change; titles and addresses have been abridged.

Many meetings are of an interdisciplinary nature - please check all subject areas.

In addition to the general Advanced Study Institutes and Advanced Research Workshops Programmes, NATO supports these types of meeting as part of a special effort in Cell to Cell Signals in Plants and Animals (CCS), Condensed Systems of Low Dimensionality (CSLD), Advanced Educational Technology (AET), Chaos, Order and Patterns : Aspects of Non-Linearity (COP) and Science of Global Climate Change (SGCC).

PUBLICATION - The papers and discussions are published in the NATO ASI Series by :
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BIOLOGICAL SIGNAL TRANSDUCTION
Prof. E.M. ROSS, Univ. of Texas, SW Med. Ctr., Dpt. of Pharmacology, 5323 Harry Hines Blvd, Dallas, TX 75235-9041 USA
6-17 August 1990 Spetsai, Greece 890302

PHOTOBIOLOGICAL TECHNIQUES
Dr. D.P. VALENZENO, Univ. of Kansas Med. Ctr., Dept. of Physiology, 39th and Rainbow Blvd., Kansas City, KS 66103 USA
1-14 July 1990 Kingston, Ontario, Canada 890309

CELLULAR REGULATION BY PROTEIN PHOSPHORYLATION
Prof. L.M.G. HEILMEYER, Rühr-Univ. Bochum, Inst. Für Phisiol. Chemie, Postfach 2148, D - 4630 Bochum, Germany
5-15 September 1990 Londe les Maures, Var, France 890523

DRUG EPIDEMIOLOGY AND POST-MARKETING SURVEILLANCE
Prof. G.P. VELO, Univ. of Verona, Inst. of Pharmacology, Policlinico Borgo Roma, 37134 Verona, Italy
27 September-8 October 1990 Erice, Italy **890642**

BIOLOGICAL EFFECTS AND PHYSICS OF SOLAR AND GALACTIC COSMIC RADIATION
Dr. P.D. McCORMACK, NASA HQ, Life Sciences Division, (Code EBM), Washington DC 20546, USA
6-19 October 1990 Cesme, Izmir, Turkey 890648

MASS SPECTROMETRY IN MOLECULAR SCIENCES : THE APPLICATIONS IN BIOCHEMISTRY, ENVIRONMENTAL AND FORENSIC SCIENCES
Prof. M.L. GROSS, Univ. of Nebraska, Dept. of Chemistry, Lincoln, NE 68588, USA
17-29 June 1990 Cetraro, Italy 890652

THE MOLECULAR PATHOLOGY OF ALCOHOLISM
Dr. T.N. PALMER, Charing Cross & Westminster Medical Sch. Dept. of Biochemistry, Fulham Palace Road, London W6 8RF,UK
26 August-6 September 1990 Il Ciocco, Italy 890653

GLOBAL REGULATION OF GENE EXPRESSION IN MICROORGANISMS
Dr. M. GRUNBERG-MANAGO, Inst. de Biologie Physico-Chimique, 13, Rue Pierre et Marie Curie, 75005 Paris, France
2-15 September 1990 Spetsai, Greece 890656

BIOPHYSICS OF PHOTORECEPTORS AND PHOTOMOVEMENTS IN MICROORGANISMS
Dr. F. LENCI, Istituto Biofisica, C.N.R., Via San Lorenzo 26, I - 56100 Pisa, Italy
16-28 September 1990 Tirrenia, Pisa, Italy 890657

PLANT MOLECULAR BIOLOGY
Prof. R.G. HERRMANN, Ludwig-Maximilians-Univ. Botanisches Inst., Menzinger Strasse 67, 8000 Munchen 19, Germany
13-23 May 1990 Klais, Germany **890680**

INDIVIDUAL CELL AND PARTICLE ANALYSIS : MULTIDISCIPLINARY APPLICATIONS TO OCEANOGRAPHY
Dr. S. DEMERS, Inst. Maurice Lamontagne-Québec, Phytoplankton Section, 850 Route de la Mer, Mont-Joli, Québec, Canada G5H 3Z4
21-30 October 1990 Maratea, Italy 890685

MOLECULAR TECHNIQUES IN TAXONOMY
Prof. G. HEWITT, Univ. of East Anglia, School of Biological Sciences, Norwich, NR4 7TJ, UK
8-22 July 1990 Norwich, UK 890686

VASCULAR ENDOTHELIUM : PHYSIOLOGICAL BASIS OF CLINICAL PROBLEMS
Prof. J.D. CATRAVAS, Medical College of Georgia, Dept. of Pharmacology, Augusta, Georgia 30912, USA
18-29 June Corfu, Greece 890694

VACCINES : RECENT TRENDS AND PROGRESS
Dr. G. GREGORIADIS, Royal Free Hospital Sch. of Medicine, Acad. Dept. of Medicine , MRC Group, Pond St. London NW3 2QG, UK
24 June-5 July 1990 Cape Sounion Beach, Greece 890714

MOLECULAR BASIS OF HUMAN CANCER
Prof. C.A. NICOLINI, Chair of Biophysics, Faculty of Medicine, Viale Benedetto XV, 2, 16132 Genova, Italy
18-30 May 1990 Erice, Italy 890788

NEW TRENDS IN PHARMACOKINETICS
Prof. A. RESCIGNO, Univ. of Parma, Faculty of Pharmacy, Via Massimo d'Azeglio, 85, 43100 Parma, Italy
4-15 September 1990 Erice, Italy 890844

RHYTHMS IN FISHES
Prof. M.A. ALI, Univ. de Montreal, Dept. de Biologie, C.P. 6128 Succ. A, Montreal, Quebec, Canada H3C 3J7
15-28 July 1990 Montreal, Canada 891043

PHYSICS AND CHEMISTRY
PHYSIQUE ET CHIMIE

VACUUM STRUCTURE IN INTENSE FIELDS
Prof. H.M. FRIED, Brown Univ. Dept. of Physics, Providence, RI 02912 USA
August 1990 Cargèse, Corsica, France 890292

LARGE-SCALE MOLECULAR SYSTEMS - QUANTUM AND STOCHASTIC ASPECTS
Prof. A. BLUMEN, Univ. of Bayreuth, Physical Inst.., Postfach 101251, D-8580 Bayreuth, Germany
25 March-7 April 1990 Maratea, Italy **890293**

MICROELECTRODES : THEORY AND APPLICATIONS
Dr. I. MONTENEGRO, Dept. of Chemistry, Univ. do Minho, Largo do Paco, 4719 Braga, Portugal
14-26 May 1990 Alvor, Portugal **890297**

SCIENCE AND TECHNOLOGY OF NANOSTRUCTURED MAGNETIC MATERIALS
Dr. G.C. HADJIPANAYIS, Kansas State Univ. Dept. of Physics, Manhattan, KS 66506, USA
24 June-7 July 1990 Crete, Grece **890299**

THE APPLICATION OF CHARGE-DENSITY RESEARCH TO CHEMISTRY AND DRUG DESIGN
Prof. G.A. JEFFREY, Univ. of Pittsburgh, Dept. of Cristallography, Pittsburgh, PA 15260, USA
17-27 April 1990 San Feliu de Guixols, Spain **890301**

DIRECT METHODS OF SOLVING CRYSTAL STRUCTURES
Prof. H. SCHENK, Univ. of Amsterdam, Lab. for Crystallography, Nieuwe Achtergracht 166, 1018 WV Amsterdam, The Netherlands
18-29 April 1990 Erice, Italy **890306**

FUNDAMENTAL SYSTEMS IN QUANTUM OPTICS
Mr. J. ZINN-JUSTIN, CEN-SACLAY, Serv. de Physique Théorique, F-91191 Gif-sur-Yvette, Cedex France
25 June-27 July 1990 Les Houches, France **890312**

PHYSICS OF GRANULAR NANOELECTRONICS
Dr. D.K. FERRY, Arizona State Univ., Dept. of Electrical & Computer Eng., Tempe, AZ 85287-6206, USA
23 July-4 August 1990 Il Ciocco, Italy **890650**

PATTERN RECOGNITION AND IMAGE PROCESSING IN PHYSICS
Prof. A.P. CRACKNELL, Univ. of Dundee, Carnegie Lab. of Physics, Dundee, DD1 4HN , U.K.
29 July-18 August 1990 Dundee, U.K. **890522**

TECHNIQUES AND CONCEPTS OF HIGH ENERGY PHYSICS
Prof. T. FERBEL, Univ. of Rochester, Dept. of Physics, Rochester, NY 14627, USA
14-25 June 1990 St. Croix, US Virgin Islands **890655**

FUNDAMENTALS OF GAS-PHASE ION CHEMISTRY
Prof. K.R. JENNINGS, Univ. of Warwick, Dept. of Chemistry, Coventry CV4 7AL UK
25 June-7 July 1990 Mt. Ste Odile, France **890675**

FUNDAMENTAL ASPECTS OF HETEROGENEOUS CATALYSIS STUDIED BY PARTICLE BEAMS
Prof. H.H. BRONGERSMA, Eindhoven Univ. of Technology, Dept. of Physics, P.O.B. 513, 5600 MB Eindhoven, The Netherlands
2-15 September 1990 Alicante, Spain **890677**

THEORY OF HIGH Tc SUPERCONDUCTIVITY
Dr. P.W. ANDERSON, J. Henry Physics Lab., PO Box 708, Princeton Univ., Princeton, NJ 08544, USA
18-30 June 1990 Cargèse, Corsica, France **890695**

THEORETICAL AND COMPUTATIONAL MODELS FOR ORGANIC CHEMISTRY
Prof. S.J. FORMOSINHO, Univ. of Coimbra, Dept. de Quimica, 3000 Coimbra, Portugal,
26 Aug.-8 Sept. 1990 Praia de Porto Novo, Portugal **890696**

PHASE TRANSITIONS IN SURFACE FILMS
Prof. H. TAUB, Univ. of Missouri-Columbia Dept. of Physics and Astronomy, 223 Physics Bdg. Columbia, Missouri 65211, USA
19-30 June 1990 Erice, Italy **890836**

INTERACTION OF CHARGED PARTICLES WITH SOLIDS AND SURFACES
Prof. F. FLORES, Univ. Autonoma Cantoblanco, Dept. Materia Condensada, Cantoblanco, E-28049 Madrid, Spain
6-18 May 1990 Alicante, Spain **890839**

WAVEGUIDE OPTOELECTRONICS
DR. J.H. MARSH, Univ. of Glasgow, Dept. of Electronics & Electrical Engin., Glasgow G12 8QQ, UK
30 July-10 August 1990 Glasgow, UK **890848**

ELECTRIFIED INTERFACES IN PHYSICS, CHEMISTRY AND BIOLOGY
Prof. R. GUIDELLI, Florence Univ., Dept. of Chemistry, Via G. Capponi 9, 50121 Florence, Italy
22 July-3 August 1990 Varenna, Italy **890849**

LOW DIMENSIONAL STRUCTURES IN SEMICONDUCTORS FROM BASIC PHYSICS TO APPLICATIONS
Dr. A.R. PEAKER, UMIST, Ctr. for Electronic Materials, PO Box 88, Manchester M 60 10D UK
1-15 July 1990 Erice, Italy **890852**

PHYSICS OF GRANULAR MEDIA
Prof. D. BIDEAU, CNRS - Groupe de Physique Cristalline, Bât. B-Physique, Campus de Beaulieu, 35042 Rennes Cedex, France
20 February-1 March 1990 Les Houches, France **890869**

PROPAGATION OF CORRELATIONS IN CONSTRAINED SYSTEMS
Dr. H.E. STANLEY, Boston Univ., Ctr. for Polymer Studies, Dept. of Physics, Boston, MA 02215, USA
1-14 July 1990 Cargèse, Corsica, France *890896*

Z° PHYSICS
Prof. M. LEVY, Univ. Pierre & Marie Curie, LPTHE , 4 Place Jussieu, 75230 Paris, Cedex 05, France
13-25 August 1990 Cargèse, Corsica, France **891025**

NONLINEAR PHENOMENA RELATED TO GROWTH AND FORMS
Dr. M. BEN AMAR, Ecole Normale Supérieure, Labo. de Physique Stat., 24 rue Lhomond, 75231 Paris, Cedex 05, France
17-29 July 1990 Cargèse, Corsica, France (COP) **890304**

INFORMATION DYNAMICS
Mr. H. ATMANSPACHER, Max Planck Inst. für Extraterrestrische Physik, D-8046 Garching, Germany
15-26 June 1990 Irsee/Kaufbeuren, Germany (COP) **890518**

QUANTUM COHERENCE IN MESOSCOPIC SYSTEMS
Prof. B. KRAMER, Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-3300 Braunschweig, Germany
2-13 April 1990 Les Arcs, France (CSLD) **890520**

HIGHLIGHTS OF THE EIGHTIES AND FUTURE PROSPECTS IN CONDENSED MATTER PHYSICS
Prof. L. ESAKI, IBM T.J. Watson Research Center, POB 218, Yorktown Heights, NY 10598, USA
16-21 September 1990 Biarritz, France (CSLD) **891022**

ASTRONOMY & ASTROPHYSICS
ASTRONOMIE & ASTROPHYSIQUE

PHYSICS OF STAR FORMATION AND EARLY STELLAR EVOLUTION
Dr. N.D. KYLAFIS, Univ. of Crete, Dept. of Physics, 714 09 Iraklion, Crete, Greece
27 May-8 June 1990 Aghia Pelagia, Crete, Greece **890324**

NEUTRON STARS : AN INTERDISCIPLINARY FIELD
Dr. J.E. VENTURA, Univ. of Crete, Dept. of Physics, Heraklion, Crete, Greece
3-14 September 1990 Aghia Pelagia, Crete, Greece **890715**

COSMIC RAYS, SUPERNOVAE AND THE INTERSTELLAR MEDIUM
Prof. M.M. Shapiro, 105 Yoakum Parkway, Apt. 1720, Alexandria, VA 22304, USA
16-25 July 1990 Erice, Italy *890845*

SUPERNOVAE
Dr. J. AUDOUZE, Institut d'Astrophysique de Paris, 98bis Bd. Arago, 75014 Paris, France
31 July-1 September 1990 Les Houches, France **890874**

MATHEMATICS
MATHEMATIQUES

GENERATORS AND RELATIONS IN GROUPS AND GEOMETRIES
Prof. E.W. ELLERS, Univ. Wurzburg, Mathematisches Inst., Am Hubland, D-8700 Wurzburg, Germany
1-14 April 1990 Castelvecchio Pascoli, Italy **890298**

COMPUTER ALGORITHMS FOR SOLVING LINEAR ALGEBRAIC SYSTEMS : THE STATE OF THE ART
Prof. E. SPEDICATO, Istituto Universitario, Dipartimento di Matimatica, Via Salvecchio 19, 24100 Bergamo, Italy
9-21 September 1990 Il Ciocco, Italy **890524**

NONPARAMETRIC FUNCTIONAL ESTIMATION AND RELATED TOPICS
Prof. G.G. ROUSSAS, Univ. of California, Div. of Statistics, 469, Kerr Hall, Davis, CA 95616, USA
29 July-11 August 1990 Spetsai, Greece **890678**

SHAPE OPTIMIZATION AND FREE BOUNDARIES
Prof. A. DAIGNEAULT, Univ. de Montreal, Dept. de Math. & de Statist., C. Post. 6128, Succ. A, Montreal, P.Q. H3C 3J7, Canada
25 June-13 July 1990 Montreal, Canada **890689**

COMPUTER & SYSTEMS SCIENCES
INFORMATIQUE & SCIENCES DES SYSTEMES

PROGRAMMING AND MATHEMATICAL METHODS
Prof. F.L. BAUER, Technische Univ. München, Inst. fur Informatik, Arcisstr. 21, Postfach 20 24 20, D-8000 München 2, Germany
24 July-5 August 1990 Marktoberdorf, Germany **890684**

NEW FRONTIERS IN THE THEORY AND PRACTICE OF COMBINATORIAL OPTIMIZATION
Dr. S. TUFEKCI, Univ. of Florida, Dept. of Indust. & Sys. Eng., 303 Weil Hall, Gainesville, Florida 32611, USA
16-28 July 1990 Ankara, Turkey **890688**

SYSTEMS ISSUES AND AUTOMATION IN AN ADVANCED CONTROL SYSTEM
Dr. J. WISE, Embry-Riddle Aeronautical Univ., Cter for Aviation/ Aerospace Research, Daytona Beach, Florida 32114, USA
18-29 June 1990 Maratea, Italy **890840**

SPEECH RECOGITION AND UNDERSTANDING : RECENT ADVANCES, TRENDS AND APPLICATIONS
Prof. P. LAFACE, Politecnico di Torino, Dept. di Automatica e Informatica, Corso Duca Degli Abruzzi 24, 10129 Torino, Italy
1-13 July 1990 Maratea, Italy **890843**

EXPERT SYSTEMS AND ROBOTICS
Prof. T. JORDANIDES, California State Univ., Electrical Eng. Dept., Long Beach, CA 90840, USA
2 -13 July 1990 Agios Nikolaos, Crete *890847*

APPLIED SCIENCES & ENGINEERING
SCIENCES APPLIQUEES & INGENIERIE

MEMBRANE FILTRATION : THEORY & APPLICATIONS
Prof. A. HUYGHEBAERT, Univ. of Ghent, Faculty of Agricultural Sciences, Coupure Links 653, 9000 Gent, Belgium
7-21 April 1990 Bonas, France **880972**

SUPERMAGNETS, HARD MAGNETIC MATERIALS
Prof. G.J. LONG, Univ. of Missouri-Rolla, Dept. of Chemistry, Rolla, MO 65401, USA
10-23 June 1990 Il Ciocco, Italy **890307**

APPLICATIONS OF METALLIC AND CERAMIC SUPERCONDUCTIVITY
Prof. H. WEINSTOCK, Air Force Off. of Sc. Research, AFOSR/NE., Bolling AFB, Washington DC 20332-6448, USA
10-20 September 1990 Fort Collins, Colorado, USA **890308**

CHROMATOGRAPHIC AND MEMBRANE PROCESSES IN BIOTECHNOLOGY
Prof. CA COSTA, Univ. of Porto, Dept. Chemical Eng., Bragas 4099, Porto, Codex, Portugal
15-27 July 1990 S. Miguel, The Azores, Portugal *890525*

DIAMOND AND DIAMOND-LIKE FILMS AND COATINGS
Dr. R.E. CLAUSING, Oak Ridge National Laboratory, POB 2008, Oak Ridge, TN 37831, USA
22 July-3 August 1990 Castelvecchio Pascoli, Italy **890651**

ADVANCES ON ROCKFILL STRUCTURES
Dr. E. MARANHA DAS NEVES, Lab. Nacional de Engenharia Civil, Av. Do Brasil 101, 1799 Lisboa, Codex, Portugal
18-29 June 1990 Lisbon, Portugal **890676**

COMBUSTING-FLOW DIAGNOSTICS
Prof. D.F.G. DURAO, Technical Univ. of Lisbon, Inst. Superior Tecnico, Av. Rovisco Pais, 1096, Lisbon Codex, Portugal
16-27 April 1990 Albufeira, Portugal **890682**

LASER SYSTEMS FOR PHOTOBIOLOGY AND PHOTOMEDICINE
PROF. S. MARTELLUCCI, The Second Univ. of Rome, Mech. Eng. Dept., Via Orazio Raimondo, 00173 Rome, Italy
11-20 May 1990 Erice, Italy **890687**

CONVECTIVE HEAT AND MASS TRANSFER IN POROUS MEDIA : FUNDAMENTALS AND APPLICATIONS
Prof. S. KAKAC, Univ. of Miami, Dept. of Mechan. Engin. , POB 284294, Coral Gables, FL 33124, USA
6-17 August 1990 Izmir, Turkey **890690**

PICTURE ARCHIVING AND COMMUNICATION SYSTEMS IN MEDICINE
Prof. H.K. HUANG, UCLA, CHS AR227, School of Medicine, Medical Imaging Division, Los Angeles,CA 90024-1721, USA
1-10 May 1990 Evian, France **890720**

ADVANCED MATERIALS AND PROCESSING FOR THE ULSI ERA
Dr. R.A. LEVY, AT&T Bell Laboratories, 600 Mountain Ave., Murray Hill, New Jersey 07974, USA
17 October 1990 - 13 March 1991
(Lectures by satellite only) **891016**

SOCIAL & BEHAVIOURAL SCIENCES
SCIENCES SOCIALES ET DU COMPORTEMENT

TUTORIALS IN MOTOR NEUROSCIENCE
Prof. G.E. STELMACH, Univ. of Wisconsin, Motor Behavior Lab., 2000 Observatory Drive, Madison, Wisconsin 53706, USA
15-24 September 1990 Ajaccio, France **890294**

OPERATIONS RESEARCH AND MANAGEMENT IN FISHING
Mr. A.J. MARQUES GUIMARAES RODRIGUES, Univ. do Minho, Largo do Paco, P-4719 Braga, Codex, Portugal
25 March-7 April 1990 Povoa do Varzim, Portugal **890303**

COGNITIVE AND LINGUISTIC ASPECTS OF GEOGRAPHIC SPACE
Prof. D.M. MARK, State Univ. of New York at Buffalo, National Ctr. for Geographic Inform. and Analysis, Buffalo, NY 14260 USA
8-20 July 1990 Las Navas Del Marques, Spain **890876**

SYNTHESES OF INSTRUCTIONAL SCIENCE AND COMPUTING SCIENCE FOR EFFECTIVE INSTRUCTIONAL COMPUTING SYSTEMS
Dr. P.H. WINNE, Simon Fraser Univ., Faculty of Eduction, Burnaby, British Columbia V5A 1S6, Canada
15-27 July 1990 Calgary, Canada **(AET) 891040**

Advanced Research Workshops

LIFE SCIENCES
SCIENCE DE LA VIE

DNA POLYMORPHISMS AS DISEASE MARKERS
Prof. D.J. GALTON, St. Bartholomew's Hospital, Diabetic Dept., West Smithfield, London EC1A 7BE , UK
25-27 September 1990 London, UK **880872**

FOREST DEVELOPMENT IN COLD CLIMATES
Dr. F.H. LOCKYEAR, Retree International, P.O. Box 346, Wilsonville, Oregon 97070, USA
25-30 June 1990 Laugarvatn, Iceland **880898**

EARLY EFFECTS OF RADIATION ON DNA
Dr. E.M. FIELDEN, MRC Radiobiology Unit, Chilton, Dicot, Oxon OX11 ORD, UK
7-11 May 1990 San Miniato, Italy **890284**

NEW BIOSYNTHENTIC BIODEGRADABLE POLYMERS OF INDUSTRIAL INTEREST FROM MICROORGANISMS
Prof. R.C. FULLER, Univ. of Massachusetts, Dept. of Biochemistry, Amherst, MA 01003, USA
3-8 June 1990 Sitges, Spain **890287**

CALCIUM TRANSPORT AND INTRACELLULAR CALCIUM HOMEOSTASIS
Dr. D. PANSU, Hôpital Edouard Herriot, Inserm Unité 45, Pavillon Hbis, 69437 Lyon, Cedex 03, France
4-7 March 1990 Lyon, France **890319**

SLOW POTENTIAL CHANGES IN THE HUMAN BRAIN
Dr. W.C. McCALLUM, Burden Neurological Inst., Stoke Lane, Stapleton, Bristol BS16 1QT, UK
13-16 May 1990 Il Ciocco, Italy **890326**

PROGRESS, PROBLEMS & PROMISE FOR AN EFFECTIVE QUANTITATIVE EVALUATION OF ATHEROSCLEROSIS IN ANIMALS AND MAN
Prof. R.W.S. WISSLER, The Univ. of Chicago, Dept. of Pathology, 5841 S. Maryland Avenue, Box 414, Chicago, Ill. 60637, USA
3-7 June 1990 Siena, Italy **890662**

POST-TRANSCRIPTIONAL CONTROL OF GENE EXPRESSION
Dr. J.E.G. McCARTHY, GBF-Gesellschaft f. Biotechn. Forschung Mascheroder Weg 1, 3300 Braunschweig, Germany
6-12 April 1990 Goslar, Germany **890668**

ADVANCES IN UNDERSTANDING VISUAL PROCESSES, CONVERGENCE OF NEUROPHYSIOLOGICAL AND PSYCHOPHYSICAL EVIDENCE
Dr. A. VALBERG, Univ. of Oslo, Dept. of Physics, P.O. Box 1048, Blindern, N-0316, Oslo 3, Norway
6-11 August 1990 Roros, Norway **890672**

THE MIDBRAIN PERIAQUEDUCTAL GREY MATTER
Dr. A. DEPAULIS, CNRS, DNBC, Centre de Neurochimie, 5 rue Blaise Pascal, 67084 Strasbourg, Cedex, France
10-14 July 1990 Château de Bonas, France **890693**

THE TRANSLATIONAL APPARATUS OF PHOTOSYNTHETIC ORGANELLES
Prof. R. MACHE, Univ. J. Fournier, Lab. de Biologie Moléculaire Végétale, BP 53X, F-38041 Grenoble, Cedex, France
3-6 July 1990 Grenoble, France **890727**

DEVELOPMENTAL PATTERNING OF THE VERTEBRATE LIMB
Prof. J.R. HINCHLIFFE, Univ. College of Wales, Dept. of Biological Sciences, Penglais, Aberystwyth, Dyfed, SY23 3DA, Wales, UK
22-25 September 1990 Santander, Spain **890827**

RECENT ADVANCES IN NEUROCYTOCHEMICAL METHODS
Prof. A. CALAS, Univ. P. & M. Curie, Institut des Neurosciences, 7 Quai Saint-Bernard, F-75252 Paris 05, France
27-28 September 1990 Domaine de Seillac, France **890834**

ROLE OF MELATONIN AND PINEAL PEPTIDES IN NEUROIMMUNOMODULATION
Prof. F. FRASCHINI, Univ. of Milan, Dept. of Pharmacology, Via Vanvitelli 32, 20129 Milan, Italy
3-9 June 1990 Erice, Italy **890855**

ENDOCYTOSIS
Prof. P. COURTOY, UCL, Unité de Biologie Cellulaire, UCL 75.39, 75 Av. Hippocrate, 1200 Bruxelles, Belgique
2-6 October 1990 Paris, France **890875**

FUNGAL CELL WALL AND IMMUNE RESPONSE
Dr. J-P.LATGE, Inst. Pasteur, Unité de Mycologie, 28 rue du Dr. Roux, F-75724 Paris, Cedex 15, France
1-5 September 1990 Greece **890891**

PHYTOCHROME PROPERTIES AND BIOLOGICAL ACTION
Dr. B. THOMAS, Inst. of Horticultural Research, Worthing Road, Littlehampton, West Sussex BN17 6LP, UK
22-27 July 1990 Chichester, UK **(CCS)880606**

PHYSICS AND CHEMISTRY
PHYSIQUE ET CHIMIE

PROCESSES OF CHEMICAL CHANGE IN SNOWPACKS
Dr. T.D. DAVIES, School of Environmental Sciences, Univ. of East Anglia, Norwich NR4 7TJ, UK
23-27 July 1990 Maratea, Italy **880594**

MIXED VALENCY SYSTEMS : APPLICATIONS IN CHEMISTRY, PHYSICS AND BIOLOGY
Prof. K. PRASSIDES, Univ. of Crete, Dept. of Chemistry, P.O. Box 1470, 711 10 Heraklion, Greece
10-16 June 1990 Aghia Pelagia, Crete, Greece **890286**

ELECTRON CRYSTALLOGRAPHY
Dr. J.R. FRYER, Univ. of Glasgow, Chemistry Dept., Glasgow G12 8QQ, Scotland, UK
22-29 April 1990 Erici, Italy **890660**

COMPUTATIONAL ASPECTS OF THE STUDY OF BIOLOGICAL MACROMOLECULES BY NMR SPECTROSCOPY
Dr. J.C. HOCH, The Rowland Institute for Science, 100 Cambridge Parkway, Cambridge, MA 02142, USA`
3-8 June 1990 Il Ciocco, Italy **890667**

EXCITATIONS IN 2 DIMENSIONAL AND 3 DIMENSIONAL QUANTUM FLUIDS
Prof. A.F.G. WYATT, Univ. of Exeter, Dept. of Physics, Stocker Rd., Exeter EX4 4QL, UK
10-14 August 1990 Exeter, UK **890725**

FUNDAMENTAL ISSUES IN CONTROL OF CARBON GASIFICATION REACTIVITY
Dr. J. LAHAYE, Ctre de Rech. Physico-Chimie des Surfaces Solides, 24, av. Président Kennedy, F-68200, Mulhouse, France
30 July-3 August 1990 Soultz, France **890729**

METHODS AND MECHANISMS FOR PRODUCING IONS FROM LARGE MOLECULES
Dr. K.G. STANDING, Physics Dept., Univ. of Manitoba, Winnipeg R3T 2N2, Canada
24-28 June 1990 Minaki, Ontario, Canada **890817**

FUNDAMENTAL ASPECTS OF INERT GASES IN SOLIDS
Dr. S. DONNELLY, Univ. of Salford, Dept. of Electronic & Electrical Eng., Manchester M5 4WT, UK
16-22 Septembre 1990 Bonas, France **890819**

Advanced Research Workshops - *continued*

RATE PROCESSES IN DISSIPATIVE SYSTEMS : FIFTY YEARS AFTER KRAMERS
Dr. P. HANGGI, Institut F. Mathematik, Univ. Augsburg, Memmingerstrasse, 6, 8900 Augsburg, Germany
9-13 September 1990 Tutzing, Germany (COP) **890521**

COMPLEX DYNAMICS AND BIOLOGICAL EVOLUTION
Dr. E. MOSEKILDE, Technical Univ. of Denmark, Physics Lab. III, MDIT, DK-2800, Lyngby, Denmark
5-10 August 1990 Hindsgavl, Denmark (COP) **890664**

NONLINEAR SUPERCONDUCTIVE ELECTRONICS
Prof. N.F. PEDERSEN, The Technical Univ. of Denmark, Physics Laboratory I, Build. 309, DK-2800 Lyngby, Denmark
3-6 September 1990 Capri, Italy (COP) **890794**

NONLINEAR DYNAMICS OF OPTICAL SYSTEMS
Dr. P. MANDEL, ULB,Service de Chimie-Physique II, C.P. 231 Bld. du Triomphe, B-1050 Bruxelles, Belgium
4-8 June 1990 Afton, OK, USA (COP) **890868**

EVOLUTION AND COMPLEXITY
Dr. J-P NADAL, Ecole Normale Supérieure, Lab. de Physique Statistique, 24, Rue Lhomond, 75231 Paris, Cedex 05, France
6-15 March 1990 Les Houches, France (COP) **890888**

SELF ORGANISATION, EMERGING PROPERTIES, AND LEARNING
Prof. I. PRIGOGINE, ULB, International Solvay Inst. for Physics and Chemistry, C.P. 231, Bld du Triomphe, 1050 Bruxelles, Belgique
12-14 March 1990 Austin, Texas, USA (COP) **891057**

LIGHT SCATTERING IN SEMICONDUCTOR STRUCTURES AND SUPERLATTICES
Dr. J.F. YOUNG, National Research Council, Division of Physics, Ottawa, Ontario K1A OR6, Canada
19-23 March 1990 Mont-Tremblant, Canada (CSLD)**880879**

RESONANT TUNNELING IN SEMICONDUCTORS : PHYSICS AND APPLICATIONS
Dr. L.L. CHANG, IBM, T. J. Watson Research Center, P.O. Box 218, Yorktown Heights, NY 10598, USA
14-18 May 1990 El Escorial, Spain (CSLD)**890674**

CONDENSED SYSTEMS OF LOW DIMENSIONALITY
Prof. J.L. BEEBY, Univ. of Leicester, Dept. of Physics, Univ. Road, Leicester, LE1 7RH, UK
22-27 April 1990 Marmaris, Turkey (CSLD) **891060**

THE SCIENCE OF GLOBAL ENVIRONMENTAL CHANGE
Dr. R.W. CORELL, National Science Foundation, Room 510, 1800 G Street N.W., Washington DC, 20550 USA
15 17 March 1990 Washington DC, USA (SGCC) **891072**

ASTRONOMY & ASTROPHYSICS
ASTRONOMIE & ASTROPHYSIQUE

STELLAR ATMOSPHERES : BEYOND CLASSICAL MODELS
Dr. L. CRIVELLARI, Osservatorio Astronomico di Trieste, Via GB Tiepolo 11, I-34131 Trieste, Italy
18-22 June 1990 Trieste, Italy **880891**

ANGULAR MOMENTUM EVOLUTION OF YOUNG STARS
Prof. S. CATALANO, Univ. of Catania, Institute of Astronomy, Citta Universitaria, Viale A. Doria, 95125 Catania, Italy
18-23 September 1990 Noto, Italy **890856**

MATHEMATICS
MATHEMATIQUES

DEFECTS, SINGULARITIES AND PATTERNS IN NEMATIC LIQUID CRYSTALS : MATHEMATICAL AND PHYSICAL ASPECTS
Prof. J.M. CORON, Lab. d'Analyse Numérique, Bât.iment 425, 91405 Orsay, Cedex, France
28 May-1 June 1990 Orsay, France **890890**

THE GLOBAL GEOMETRY OF TURBULENCE
Prof. J. JIMENEZ SENDIN, E.T.S. Ing. Aeronauticos, Dept. Fluid Mechanics, Pl. Cardenal Cisneros 3, 28040 Madrid, Spain
8-14 July 1990 Rota, Spain (COP) **890665**

NONLINEAR MODELLING AND FORECASTING
Prof. J.D. FARMER, Los Alamos National Laboratory, Los Alamos, NM 87545, USA
24-28 September 1990 Sant Fe, NM, USA, (COP) **890691**

EARTH SCIENCES
SCIENCES DE LA TERRE

SAND, DUST AND SOIL IN THEIR RELATION TO AEOLIAN AND LITTORAL PROCESSES
Prof. O.E. BARNDORF-NIELSEN, Matematisk Institut, Aarhus University, Ny Munkegade, DK-8000 Aarhus C, Denmark
14-18 May 1990 Sandbjerg, Denmark **890670**

APPLIED SCIENCES & ENGINEERING
SCIENCES APPLIQUEES & INGENIERIE

TOUGHENING MECHANISMS IN QUASI-BRITTLE MATERIALS
Prof. S.P. SHAH, Northwestern Univ., Ctr. for Concrete & Geomaterials, Technological Institute, Evanston, Il 60208, USA
28-31 August 1990 Evanston, Illinois, USA **890316**

BRIDGE EVALUATION, REPAIR AND REHABILITATION
Prof. A.S. NOWAK, Univ. of Michigan, 2370 G.G. Brown, Ann Arbor, MI 48109, USA
30 April-3 May 1990 Baltimore, MD, USA **890323**

WATER SAVING TECHNIQUES FOR PLANT GROWTH
Prof. M.F.L. DE BOODT, Soil Physics Dept., State Univ. Ghent, Coupure Links 653, 9000 Gent, Belgium
24-26 September 1990 Gent, Belgium **890719**

3D - IMAGING IN MEDICINE
Prof. K-H HOHNE, Univ. Hospital Eppendorf, Inst. für Math. und Datenverarbeitung, Martinistr. 52, 2000 Hamburg 20, Germany
25-29 June 19901 Travemunde, Germany **890726**

ARCHITECTURE & PERFORMANCE ISSUES OF HIGH-CAPACITY LOCAL AND METROPOLITAN AREA NETWORKS
Prof. G. PUJOLLE, Univ. of Paris VI, Laboratoire MASI, UPMC-CNRS UA 818, 4 place Jussieu, 75252 Paris Cedex 05, France
25-27 June 1990 Sophia Antipolis, France **890813**

COMPUTER-AIDED SUPPORT SYSTEMS FOR WATER RESOURCES RESEARCH AND MANAGEMENT
Prof. D.P. LOUCKS, Cornell Univ., School of Civil & Environmental Engin., Hollister Hall, Ithaca, NY 14853-3501, USA
24-28 September 1990 Vidago, Portugal **890821**

NITRATE CONTAMINATION : EXPOSURE, CONSEQUENCE AND CONTROL
Prof. I. BOGARDI, Univ. of Nebraska-Lincoln, Department of Civil Engineering, W348 Nebraska Hall, Lincoln, NE 68588-0531, USA
8-12 September 1990 Lincoln, Nebraska, USA **890832**

GORTLER VORTEX FLOW
Prof. H. PEERHOSSAINI, Univ. de Nantes, Laboratoire de Thermocinetique, 2 rue de la Houssinière, 44072 Nantes, France
10-12 June 1990 Nantes, France (COP) **890889**

SOCIAL & BEHAVIOURAL SCIENCES
SCIENCES SOCIALES ET DU COMPORTEMENT

THE CHANGING UNIVERSITY AND THE EDUCATION AND EMPLOYMENT OF SCIENTISTS AND ENGINEERS
Dr. D.S. ZINBERG, Harvard Univ. , Kennedy School of Government, 79, J.F. Kennedy Street, Cambridge, MA 02138, USA
8-10 March 1990 Cambridge, Massachusetts, USA **891066**

ADVANCED TECHNOLOGIES IN THE TEACHING OF MATHEMATICS AND SCIENCE
Prof. D.L. FERGUSSON, SUNY, Dept. of Techn. & Society, Stony Brook, NY 11794-2250, USA
11-13 July 1990 Glen Cove, New York, USA (AET) **880956**

KNOWLEDGE ACQUISITION IN THE DOMAIN OF PHYSICS AND INTELLIGENT LEARNING ENVIRONMENT
Dr. A. TIBERGHIEN, C.N.R.S., ECULLY, Lab. IRPEACS, 93, Chemin des Mouilles, BP 167, 69131 Ecully Cedex, France
3-6 July 1990 Lyon-Ecully, France (AET) **890901**

THE BRIDGE TO INTERNATIONAL COMMUNICATION : INTELLIGENT TUTORING SYSTEMS FOR FOREIGN LANGUAGE LEARNING
Dr. M. YAZDANI, Exeter Univ., Dept. of Computer Science, Prince of Wales Rd., Exeter EX4 4PT, UK
19-21 September 1990 Washington DC, USA (AET) **891034**

COGNITIVE MODELLING AND INTERACTIVE ENVIRONMENTS
Prof. D.G. BOUWHUIS, Univ. of Technology, Inst. for Perception Research & Technical Psychonomics, Eindhoven, The Netherlands
5-8 November 1990 Eindhoven, The Netherlands (AET) **891037**

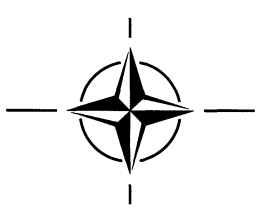
COMPUTER-BASED LEARNING ENVIRONMENTS AND PROBLEM SOLVING
Dr. E. DE CORTE, Univ. of Leuven, Center for Instructional Psychology, Vasaliusstraat 2, B-3000 Leuven, Belgium
26-29 September 1990 Leuven, Belgium (AET) **891038**

MINDTOOLS : COGNITIVE TECHNOLOGIES FOR MODELING KNOWLEDGE
Prof. D.H. JONASSEN, Univ. of Colorado, School of Education, 1200 Larimer St., CB 106, Denver, CO 80204, USA
4-10 July 1990 Enschede, The Netherlands (AET) **891039**

INTEGRATING ADVANCED TECHNOLOGY INTO TECHNOLOGY EDUCATION
Dr. M. HACKER, New York State Dept. of Education, One Commerce Plaza, Albany, NY 12234, USA
9-12 October 1990 Holland (AET) **891041**

NEW DIRECTIONS FOR INTELLIGENT TUTORING SYSTEMS
Prof. E. COSTA, Universidade de Coimbra, Dept. de Engenharia Electrotecnica, 3000 Coimbra, Portugal
6-10 October 1990 Sesimbra, Portugal (AET) **891053**

STRUCTURES OF COMMUNICATION AND INTELLIGENT HELP FOR HYPERMEDIA COURSEWARE
Prof. A.J.M. OLIVEIRA, Univ. de Aveiro, Dept. de Didactica e Techn. Educativa, Campo de Santiago, 3800 Aveiro, Portugal
19-24 April 1990 Espinho, Portugal (AET) **891054**



Further information on a particular meeting should be obtained from the meeting director named above.

Further information on the NATO Science Programme may be obtained from : Scientific Affairs Division (Ref. 1990-1)
NATO, B-1110 Brussels, Belgium

CONGRESSIONAL SCIENTIST FELLOWSHIP PROGRAM
1990–1991
THE AMERICAN PHYSICAL SOCIETY

Seventeenth Annual Competition

PURPOSE: Fellows will spend one year as a member of the staff of a Congressman or of a Congressional committee, thereby contributing an assessment of the technical aspects of public policy issues to the political process.

QUALITIES SOUGHT IN APPLICANTS: Prospective Fellows are expected to have demonstrated competence in some area of physics, have a background in science and technology, and have a strong interest and some experience in applying scientific knowledge toward the solution of social problems. Candidates are expected to be articulate and literate, willing to work on a variety of problems with a variety of people and to have some experience in or be willing to learn the governmental process.

TERM OF APPOINTMENT: Fellows serve for one year, beginning 1 September 1990. APS Fellows will join the Fellows selected by other scientific and engineering societies in Washington in September for a two-week orientation program organized by the American Association for the Advancement of Science. During the orientation, Fellows meet Senators, Representatives, and Congressional committee staff members, visit a number of government agencies, and receive detailed information about opportunities in Congressional offices. The choice of an assignment is unrestricted and reserved to the Fellows.

STIPEND ALLOWANCES: The maximum fellowship stipend is $40,000. An appropriate allowance is made for vouchered relocation expenses and for vouchered travel expenses incurred during the fellowship year.

APPLICATION PROCEDURE: Applicants should submit a letter of intent and a resume and arrange to have three letters of reference sent directly to the program administrator. Candidates should include in the letter of intent a statement which tells why they have applied to the program and a brief description of their public service experience. Letters of reference should be solicited from people who can discuss not only the candidate's competence as a physicist but also the candidate's education and experience which would make the candidate particularly qualified to serve in a Congressional office.

Completed applications, including all letters of reference, must be received by 16 February 1990.

FOR FURTHER INFORMATION: Please contact **Dr. Mary L. Shoaf, Administrator, Congressional Scientist Fellowship Program, The American Physical Society, 335 East 45 Street, New York, New York 10017, (215) 793-1629 or (212) 682-7341.**

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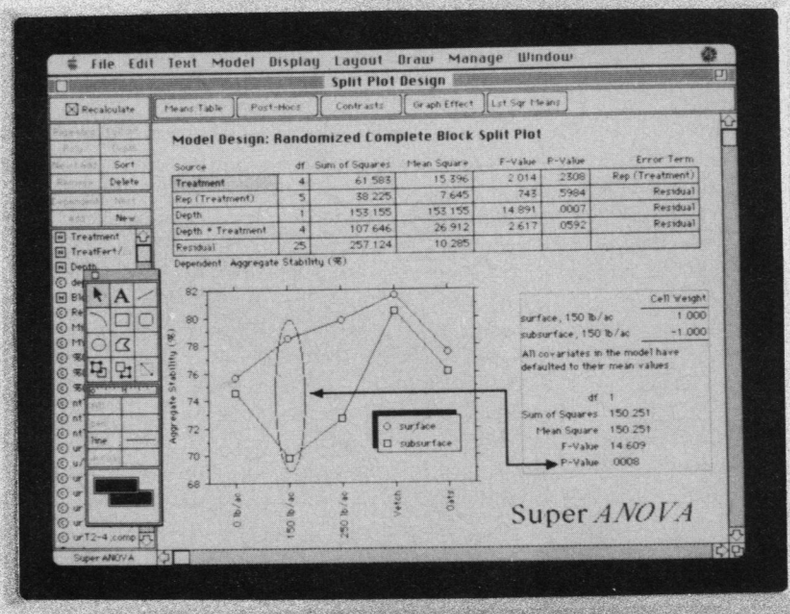

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