

28 JANUARY 1983 • VOL. 219 • NO. 4583

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# SCIENCE

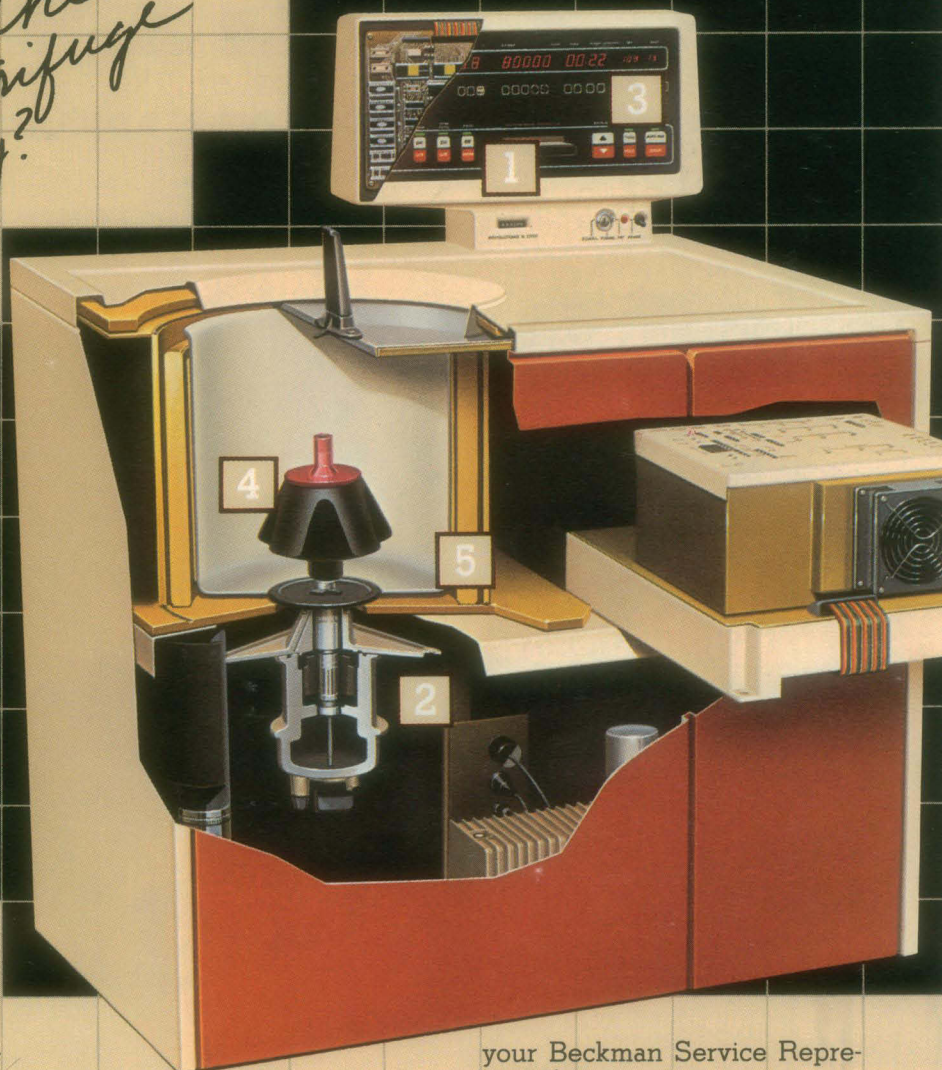
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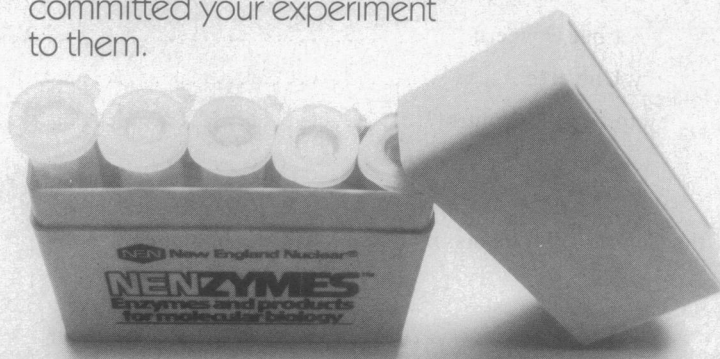
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<b>LETTERS</b>	The American Chemical Society: Fact and Fancy: <i>R. W. Parry</i> and <i>C. F. Callis</i> ; Space Astronomy: <i>J. P. Testa, Jr.</i> , and <i>J. R. Arnold</i> ; Laboratory Maintenance: <i>J. S. Dickey, Jr.</i> ; Cotton Dust Standard: <i>E. Frumin</i> .....	338
<b>EDITORIAL</b>	"Science Is Sciencing": <i>N. L. Gonzalez</i> .....	345
<b>ARTICLES</b>	Ultraviolet Spectroscopy and the Composition of Cometary Ice: <i>P. D. Feldman</i> .....	347
	Sweden Beyond Oil: The Efficient Use of Energy: <i>T. B. Johansson et al.</i> .....	355
	Obsidian Dating and East African Archeology: <i>J. W. Michels, I. S. T. Tsong, C. M. Nelson</i> .....	361
<b>NEWS AND COMMENT</b>	Missouri's Costly Dioxin Lesson .....	367
	Flaws Found in Popular Code .....	369
	<i>Briefing:</i> Large Volkswagens in the Western Sky; Britain to Study Health Effects of Nuclear Tests; FDA Assails Safety of Depo-Provera; Schweiker Quits HHS, Heckler Named to Post .....	370
	Drug Firm and UC Settle Interferon Suit .....	372
<b>RESEARCH NEWS</b>	Mammoth Lakes Quiet but Concern Persists .....	373
	The New Inflationary Universe .....	375
	Is Tyrosine the Key to Growth Control?.....	377
<b>BOOK REVIEWS</b>	Hailstorms of the Central High Plains, <i>reviewed by W. F. Hitschfeld</i> ;	

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Atmosphere-Ocean Dynamics, *J. R. Holton*; Death Is a Social Disease, *J. M. Eyster*; Crusaders for Fitness, *R. M. Morantz*; Books Received ..... 379

<b>REPORTS</b>	Computed Tomographic Analysis of Meteorite Inclusions: <i>J. R. Arnold et al.</i> ....	383
	Hardened Subtidal Stromatolites, Bahamas: <i>J. J. Dravis</i> .....	385
	Climatic Fluctuations Due to Deep Ocean Circulation: <i>R. G. Watts and M. E. Hayder</i> .....	387
	Biological Control of the Removal of Abiogenic Particles from the Surface Ocean: <i>W. G. Deuser et al.</i> .....	388
	Lizard Tail Autotomy: Function and Energetics of Postautotomy Tail Movement in <i>Scincella lateralis</i> : <i>B. E. Dial and L. C. Fitzpatrick</i> .....	391
	A Bean $\alpha$ -Amylase Inhibitor Formulation (Starch Blocker) Is Ineffective in Man: <i>G. L. Carlson et al.</i> .....	393
	Chromosome Localization of Highly Repetitive Human DNA's and Amplified Ribosomal DNA with Restriction Enzymes: <i>D. A. Miller, Y.-C. Choi, O. J. Miller</i> .....	395
	Differential Classical Conditioning of a Defensive Withdrawal Reflex in <i>Aplysia californica</i> : <i>T. J. Carew, R. D. Hawkins, E. R. Kandel</i> .....	397
	A Cellular Mechanism of Classical Conditioning in <i>Aplysia</i> : Activity-Dependent Amplification of Presynaptic Facilitation: <i>R. D. Hawkins et al.</i> .....	400
	Associative Conditioning of Single Sensory Neurons Suggests a Cellular Mechanism for Learning: <i>E. T. Walters and J. H. Byrne</i> .....	405
	Methyl 4,6-Dichloro-4,6-Dideoxy- $\alpha$ -D-Galactopyranoside: An Inhibitor of Sweet Taste Responses in Gerbils: <i>W. Jakinovich, Jr.</i> .....	408
	Net Primary Productivity in Coral Reef Sponges: <i>C. R. Wilkinson</i> .....	410
	Taste Flashes: Reaction Times, Intensity, and Quality: <i>S. T. Kelling and B. P. Halpern</i> .....	412
	A Benzodiazepine Receptor Antagonist Decreases Sleep and Reverses the Hypnotic Actions of Flurazepam: <i>W. B. Mendelson et al.</i> .....	414
	Nigral Transplants Reinnervating the Dopamine-Depleted Neostriatum Can Sustain Intracranial Self-Stimulation: <i>P. J. Fray et al.</i> .....	416
	Recruitment and Population Dynamics of a Coral Reef Fish: <i>B. C. Victor</i> .....	419

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## COVER

Tail autotomy sequence between a snake predator (*Lampropeltis triangulum*) and its lizard prey (*Scincella lateralis*). Intravertebral autotomy occurs in those lizard species that possess cartilaginous fracture planes within their caudal vertebrae. Autotomized tails may exhibit rapid, energetically expensive muscle contractions for several minutes after autotomy that attract a predator's attention and delay its ingestion of the autotomized tail. See page 391. [Benjamin E. Dial, Department of Biology, Texas A&M University, College Station 77843]

American Association for the Advancement of Science was founded in 1848 and incorporated in 1874. Its objects 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.





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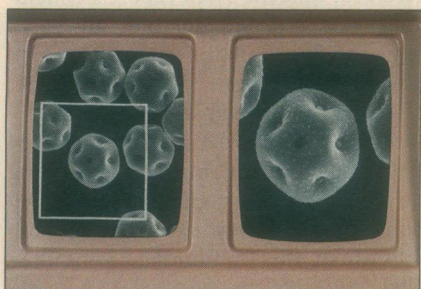
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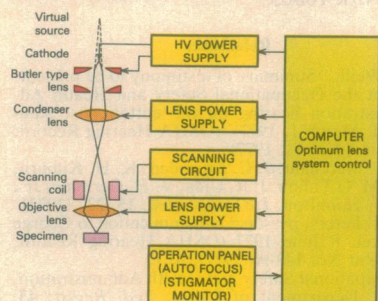
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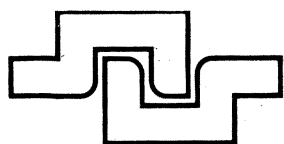


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Each meeting is held under the responsibility of its Director, to whom all requests for information, attendance or support should be addressed. Attendance at meetings marked ● is, however, by invitation only. A number of the meetings are being held under the sponsorship of the Special Programmes on Eco-Sciences (ES), Human Factors (HF), Marine Sciences (Mar.S) and Materials Science (Mat.S). The meetings marked ‡ are of particular industrial interest.

Locations and dates may change. Titles and addresses have been abridged. Many meetings are of an interdisciplinary nature: please check all subject areas.

## I. LIFE SCIENCES

## ASIs

## BRAIN MECHANISMS OF SPATIAL VISION●

Dr. C.J. INGLE, Lab. Neuropsych. expérim., INSERM, Unité 94, 16, Av. Doyen Lépine, 69500 Bron, France  
June 1983: Lyon Region, France

## BIOMECHANICS OF NORMAL AND PATHOLOGICAL HUMAN ARTICULATING JOINTS

Dr. K.M. CORREIA DA SILVA, Lab. Fisiologia, Inst. Gulbenkian, 2781 Oeiras, Portugal  
20 June-1 July 1983: Sintra Estoril (Alcabideche), Portugal

## TARGETS FOR THE DESIGN OF ANTIVIRAL AGENTS ‡

Prof. E. DE CLERCQ, Rega Inst., K.U.L., Minderbroedersstr. 10, 3000 Louvain, Belgium  
19 June-2 July 1983: Les Arcs, France

## MECHANISMS OF GASTROINTESTINAL MOTILITY AND SECRETION

Prof. A. BENNETT, Dep. Surgery, King's Coll. Hosp., Rayne Inst., 123 Coldharbour Lane, London SE5 8NU, UK  
5-16 September 1983: Erice, Sicily

## RECEPTOR-MEDIATED TARGETING OF DRUGS ‡

Dr. G. GREGORIADIS, Clinical Res. Ctr., Watford Rd., Harrow, Middx HA1 3UJ, UK  
September 1983: Cape Sounion, Greece

## LIVER, NUTRITION AND BILE ACIDS

Prof. C.J. MIRAS, Univ. Athens, School of Medicine, 38 D. Soutsou, Athens 602, Greece  
29 August-9 September 1983: Chania, Crete, Greece

## REGRESSION OF ATHEROSCLEROTIC LESIONS

Prof. M.R. MALINOW, Oregon Regional Primate Res. Ctr., 505 NW 185th Av., Beaverton, OR 97006, USA  
11-23 September 1983: Maratea, Italy

## MOLECULAR BIOLOGY OF MAMMALIAN CELLS

Dr. C.T. CASKEY, M804 Debakay Bldg., Baylor Coll. of Medicine, 1200 Moursund Av., Houston, TX 77030, USA  
29 August-10 September 1983: Spetsai, Greece

## INDUSTRIAL ASPECTS OF BIOCHEMISTRY AND GENETICS ‡

Dr. G. ALAEDDINOGLU, Dept. Biological Sciences, Middle East Techn. Univ., Ankara, Turkey  
4-14 September 1983: Izmir, Turkey

## BIOMEMBRANES: DYNAMICS AND BIOLOGY

Prof. F. CARVALHO GUERRA, Ctr. Citologia Exper., Univ. do Porto, Rua Anibal Cunha 164, Porto, Portugal  
12-25 June 1983: Oporto, Portugal

## STRUCTURE AND FUNCTION OF THE GENETIC APPARATUS

Prof. C.A. NICOLINI, Biophysics, Temple Univ., Health Sc. Ctr., 3223 N. Broad St., Philadelphia PA 19140, USA  
18-30 September 1983: Erice, Italy

## RADIO LABELED CELLULAR BLOOD ELEMENTS

Dr. M.L. THAKUR, Yale Univ., Medical School, New Haven, CT 06510, USA  
29 August-9 September 1983: Maratea, Italy

## SEMIOTICS AND INTERNATIONAL SCHOLARSHIP

Dr. M. HERRERA, Dep. de Lenguas y Sociología, Indiana Univ., P.O. Box 10, Bloomington, IN 47402, USA  
6-9 May 1983: Château de Bonze, France

## PHYSICS OF SUBMICRON SEMICONDUCTOR DEVICES

Dr. D.K. FERRY, Dept. Electrical Eng., Colorado State Univ., Fort Collins, CO 80523, USA  
10-23 July 1983: Place to be announced

## PROGRESS IN GAUGE FIELD THEORY

Prof. H. LEHMANN, II. Inst. f. Theoret. Physik, Univ. Hamburg, Luruper Chaussee 149, 2 Hamburg 50, Germany  
1-15 September 1983: Cargèse, Corsica, France

## QUANTITATIVE ELECTRON MICROSCOPY

Prof. R.P. FERRIER, Dept. of Natural Philosophy, Univ. of Glasgow, Glasgow G12 8QQ, UK  
7-27 August 1983: Glasgow, Scotland, UK

## DENSITY FUNCTIONAL METHODS IN PHYSICS

Dr. R.M. DREIZLER, Inst. Theoret. Physik, Univ. Frankfurt, Robert-Mayer-Str. 8-10, 6 Frankfurt/Main, Germany  
4-16 September 1983: Sintra Estoril (Alcabideche), Portugal

## ENERGY TRANSFER PROCESSES IN CONDENSED MATTER

Prof. B. DI BARTOLO, Dept. Physics, Boston College, Chestnut Hill, MA 02167, USA  
15-30 June 1983: Erice, Italy

## ELECTRODYNAMICS AND QUANTUM OPTICS

Prof. A.D. BARUT, Univ. of Colorado, Dept. of Physics, Boulder, CO 80309, USA  
23 May-4 June 1983: Aspen, Colorado, USA

## PARTICLES AND FIELDS

Prof. M. LEVY, Lab. Phys. théor., Univ. P. et M. Curie, 4, place Jussieu, 75230 Paris Cedex 05, France  
6-22 July 1983: Cargèse, Corsica, France

## STATISTICAL AND PARTICLE PHYSICS: COMMON PROBLEMS AND TECHNIQUES

Prof. D.J. WALLACE, Physics Dept., James Clerk Maxwell Bldg., Univ., Mayfield Road, Edinburgh EH9 3JZ, UK  
31 July-20 August 1983: Edinburgh, Scotland, UK

## QUARKS, LEPTONS AND BEYOND

Dr. R.D. PECCEI, Max-Planck-Inst. f. Physik u. Astroph., Fohringer Ring 6, 8 München 40, Germany  
5-16 September 1983: Munich, Germany

## NON-EQUILIBRIUM COOPERATIVE PHENOMENA IN PHYSICS AND RELATED FIELDS

Dr. M.G. VELARDE, U.N.E.D.-Ciencias, Apdo. Correos 50 487, Madrid, Spain  
1-11 August 1983: El Escorial (Madrid), Spain

## BIRTH AND INFANCY OF STARS

Dr. R. STORA, Div. Théorique, CERN, 1211 Geneva 23, Switzerland  
8 August-2 September 1983: Les Houches, France

## ARWs

## POSITRON SCATTERING IN GASES ●

Prof. M.R.C. McDOWELL, Dept. of Maths, Royal Holloway Coll., Egham Hill, Egham, Surrey TW20 0EX, UK  
19-23 July 1983: London, UK

## PHENOMENA INDUCED BY INTERMOLECULAR INTERACTIONS ●

Dr. G. BIRNBAUM, National Bureau of Standards, Bldg 221 B312, Washington DC 20234, USA  
6-9 May 1983: Château de Bonze, France

ADVANCED RESEARCH WORKSHOPS (ARWs) are working meetings which enable leading researchers, scientists and engineers to review the state-of-the-art in specific topics in fast moving fields and to formulate recommendations for the future. They are of about five days' duration and attendance is usually by invitation only.

PUBLICATIONS: Proceedings of meetings are published in the NATO ASI Series by: Plenum – Reidel – Nijhoff – Springer Verlag.

## ARWs

## THE LAST DEGLACIATION: TIMING AND MECHANISM ●

Dr. J.-C. DUPLESSY, Centre des Faibles Radioactivités, CNRS, 91190 Gif-sur-Yvette, France  
2-6 May 1983: Virginia, USA

## ORDERED FIELDS AND REAL ALGEBRAIC GEOMETRY ●

Prof. D.W. DUBOIS, Dept. of Mathematics, Univ. of New Mexico, Albuquerque, NM 87131, USA  
4-9 July 1983: Boulder, Colorado, USA

## CHEMICAL INSTABILITIES: APPLICATIONS IN CHEM., ENG., GEOLOGY &amp; MAT. SCIENCE ●

Prof. I. PRIGOGINE, Serv. Chim. Phys. II, C.P. 231, Campus Plaine ULB, Bld du Triomphe, 1050 Bruxelles, Belgium  
14-17 March 1983: Austin, Texas, USA

## MATHEMATICAL ASPECTS OF SUPERSPACE ●

Prof. H.-J. SEIFERT, Hochschule der Bundeswehr, Holstenhofweg 85, 2 Hamburg 70, Germany  
12-16 July 1983: Hamburg, Germany

## GALAXIES AND THE EARLY UNIVERSE ●

Dr. J. AUDOUZE, Inst. d'Astrophysique, 98 bis Bld Arago, 75014 Paris, France  
13-19 March 1983: Les Arcs, France

## LARGE-SCALE OCEANOGRAPHIC EXPERIMENTS AND SATELLITES (Mar. S) ●

Dr. Catherine GAUTIER, California Space Inst., A-030, Scripps Inst. Oceanogr., La Jolla, CA 92093, USA  
3-7 October 1983: Corsica, France

## DYNAMIC PROCESSES IN THE CHEMISTRY OF THE UPPER OCEAN (Mar. S) ●

Prof. R. CHESSELET, Centre des Faibles Radioactivités, 91190 Gif-sur-Yvette, France  
6-13 July 1983: Jouy-en-Josas, France

## ATMOSPHERIC AND OCEANIC CIRCULATION IN THE MEDITERRANEAN BASIN (Mar. S) ●

Prof. H. CHARNOCK, Dept. of Oceanography, Univ. of Southampton, Southampton SO9 5NH, UK  
7-14 September 1983: Santa Teresa, La Spezia, Italy

## SATELLITE ALTIMETRY AND OCEAN CIRCULATION ●

Dr. T.D. ALLAN, Inst. Oceanographic Sciences, Brook Road, Wormley, Godalming, Surrey GU8 5UB, UK  
11-15 April 1983: San Miniato, Italy

## IV. ENGINEERING AND APPLIED SCIENCES

## ASIs

## ZEOLITES SCIENCE AND TECHNOLOGY ‡

Dr. F. RAMOA RIBEIRO, Dept. Chem. Eng., Inst. Sup. Tecnico, Av. Rovisco Pais, 1000 Lisbon, Portugal  
11-12 May 1983: Sintra Estoril (Alcabideche), Portugal

## FAST ELECTRICAL AND OPTICAL DIAGNOSTIC PRINCIPLES AND TECHNIQUES ‡

Dr. L.H. LUESSEN, Naval Surface Weapons Ctr., Code F12, Dahlgren, VA 22448, USA  
24 July-6 August 1983: Castelvecchio di Pascoli, Italy

## INFORMATION TECHNOLOGY AND THE COMPUTER NETWORK ‡

Dr. K.G. Beauchamp, Univ. Lancaster, Computer Services Dept., Bailrigg, Lancaster LA1 4YW, UK  
June/July 1983: Bonas, France



**CARDIOVASCULAR PSYCHOPHYSIOLOGY (HF-Conf.)**

Prof. J.F. ORLEBEKE, Dept. Psychology, Free Univ., PO Box 7161, 1081 HV Amsterdam, Netherlands  
12-17 June 1983 : Noordwijkerhout, Netherlands

**ARWs****IMPACT OF SOLAR ULTRAVIOLET RADIATION UPON TERRESTRIAL ECOSYSTEMS •**

Dr. R.C. WORREST, Dept. General Science, Oregon State Univ., Corvallis, OR 97331 USA  
27-30 September 1983 : Bad Windsheim, Germany

**NEW PERSPECTIVES IN MEMBRANE DYNAMICS •**

Dr. A. Waksman, Ctr. de Neurochimie du CNRS, 5, rue Blaise Pascal, 67084 Strasbourg Cedex, France  
Date to be announced : Strasbourg, France

**DYNAMICS OF BIOCHEMICAL SYSTEMS •**

Dr. J. RICARD, Ctr. Biochimie et Biol. Moléculaire du CNRS, BP No. 71, 13277 Marseille Cedex 9, France  
19-23 September 1983 : Marseille, France

**STRUCTURAL & GENE ORGANIZATION OF SOME KEY IDIOTYPIC SYSTEMS IN THE MOUSE •**

Prof. M. FOUGEREAU, Ctr. d'immunologie de Marseille-Luminy, Case 906, 13288, Marseille Cedex 9, France  
April 1983 : Marseille, France

**THE ROLE OF CELL INTERACTIONS IN EARLY NEUROGENESIS •**

Dr. M. WEBER, Lab. Pharmacol. et Toxicol. Fondam., CNRS, 205, route de Narbonne, 31400 Toulouse, France  
29 May-3 June 1983 : Cargèse, Corsica, France

**SOCIAL SUPPORT: THEORY, RESEARCH AND APPLICATIONS •**

Prof. I.G. SARASON, Dept. Psychology, Mail Stop N1-25, Univ. of Washington, Seattle, WA 98195, USA  
12-16 September 1983 : Château de Bonas, France

**GEOPOLITICS AND THE NUCLEAR ERA •**

Dr. C. ZORGBIBE, Ctr. d'Etudes Juridiques, Univ. de Paris XI, 54 Bd. Desgranges, 92330 Sceaux, France  
22-26 June 1983 : Place to be announced

**THE CUMULATIVE EFFECT OF ORGANIC PHOSPHATE INTOXICATIONS BY MAN •**

Prof. A. HEYNDRICKX, Dept. Toxicology, State Univ. of Ghent, Hospitaalstraat 13, 9000 Gent, Belgium  
2-7 May 1983 : Ghent, Belgium

**BEHAVIOURAL EPIDEMIOLOGY AND DISEASE PREVENTION •**

Dr. R.M. KAPLAN, Dept. of Community Medicine, (M-022), Univ. of California, La Jolla, CA 92093, USA  
14-20 April 1983 : Bellagio, Italy

**FORMAL CONCEPTS OF ECOLOGY IN THE EIGHTIES (ES) •**

Dr. D.W. HEAL, Inst. Terrestrial Ecology, Merlewood Res. Stn., Grange-over-Sands, Cumbria LA11 6JU, UK  
19-28 September 1983 : Grange-over-Sands, Cumbria, UK

**MEDITERRANEAN MARINE ECOSYSTEMS (ES) •**

Prof. Maria APOSTOLOPOULOU, Univ. Athens, Zoological Lab. & Museum, Panepistimiopolis, Athens 621, Greece  
26-30 September 1983 : Athens, Greece

**THE FUTURE & USE OF ECOLOGY AFTER THE DECADE OF THE ENVIRONMENT, 1970-1980 (ES) •**

Prof. F. BOURLIERE, INTECOL, Inst. of Ecology, Univ. of Georgia, Athens, GA 30602, USA  
6-9 April 1983 : Paris, France

**DENITRIFICATION IN THE NITROGEN CYCLE (ES) •**

Dr. K.H. DOMSCH, Inst. f. Bodenbiologie, B.F.A. f. Landwirtschaft, Bundesallee 50, 33 Braunschweig, Germany  
24-26 May 1983 : Braunschweig-Voelkenrode, Germany

**ECOACCIDENTS (ES) •**

Dr. J. CAIRNS, Univ. Ctr. for Environ. Studies, Virginia Polytechnic, Blacksburg, VA 24061, USA  
19-25 September 1983 : Noordwijkerhout, The Netherlands

**AGEING AND TECHNOLOGICAL ADVANCES (HF-Symp.)**

Dr. J.E. BIRREN, E.P. Andrus Ctr., MC 0191, Univ. Sthn. California, University Park, Los Angeles CA 90089, USA  
October 1983 : Place to be announced

**II PHYSICS****ASIs****REGULAR AND CHAOTIC MOTIONS IN DYNAMICAL SYSTEMS**

Prof. G. VELLO, Ist. di Fisica, Via Imerio 46, 40126 Bologna, Italy  
2-14 July 1983 : Ence, Italy

**PERCOLATION, LOCALIZATION AND SUPERCONDUCTIVITY**

Prof. A.M. GOLDMAN, Sch. Phys. & Astron., Univ. Minnesota, 116 Church St. S.E., Minneapolis, MN 55455, USA  
19 June-1 July 1983 : Les Arcs, France

**MOMENT FORMATION IN SOLIDS**

Dr. W.J.L. BUYERS, Atomic Energy of Canada Ltd, Chalk River, Ontario, Canada K0J 1J0  
21 August-2 September 1983 : Victoria, Vancouver, Canada

**MULTICRITICAL PHENOMENA**

Dr. R. PYNN, Inst. Laue-Langevin, 156X Centre de Tri, 38042 Grenoble Cedex, France  
10-20 April 1983 : Geilo, Norway

**INVERSE METHODS IN ELECTROMAGNETIC IMAGING •**

Dr. W.M. BOERNER, Comm. Lab. Inform. Engin. Dept., UICC, P.O.B. 4348, SED - 1141, Chicago, IL 60680, USA  
18-24 September 1983 : Bad Windsheim, Germany

**CHAOTIC BEHAVIOUR IN QUANTUM SYSTEMS •**

Dr. G. CASATI, Ist. di Fisica, Via Celoria 16, 20133 Milano, Italy  
20-25 June 1983 : Como, Italy

**PRIMARY PHOTOPHYSICAL PROCESSES •**

Prof. E.W. SCHLAG, Inst. f. Physik. - Theoret. Chemie, Lichtenbergstr. 1, 8046 Garching, Germany  
October 1983 : Bavaria, Germany

**TESTING NONLINEAR DYNAMICS •**

Prof. J. GOLUB, Dept. of Physics, Haverford College, Haverford, PA 19041, USA  
5-9 June 1983 : Haverford, Pennsylvania, USA

**III CHEMISTRY, EARTH SC., MATHEMATICS****ASIs****FELDSPARS, FELDSPATHOIDS AND THEIR PARAGENESSES**

Prof. W.L. BROWN, Lab. Petrol.-Geoch., Univ. de Nancy I, BP 239, 54506 Vandœuvre-les-Nancy Cedex, France  
26 June-7 July 1983 : Rennes, France

**CHEMOMETRICS MATHEMATICS AND STATISTICS IN CHEMISTRY**

Prof. B.R. KOWALSKI, Lab. Chemometrics, Dept. Chemistry BG-10, Univ. of Washington, Seattle, WA 98195, USA  
12-23 September 1983 : Cosenza, Italy

**MAGNETIC RESONANCE TECHNIQUES IN FOSSILS**

Dr. L. PETRAKIS, Gulf Science & Technology Co., P.O. Drawer 2038, Pittsburg, PA 15230, USA  
13-16 July 1983 : Crete, Greece

**PHYSICS AND CHEMISTRY OF ELECTRONS AND RELATED IONS IN CONDENSED MATTER**

Dr. J.V. ACRIVOS, Dept. of Chemistry, San Jose State Univ., San Jose, CA 95192, USA  
4-16 September 1983 : Cambridge, UK

**APPROXIMATION THEORY AND SPLINE FUNCTIONS**

Prof. S.P. SINGH, Dept. Math & Statistics, Memorial Univ., St. Johns, Newfoundland, Canada A1B 3X7  
22 August-2 September 1983 : St. John's, Newfoundland, Canada

**METHODS IN RING THEORY**

Prof. F. VAN DYSTAEYEN, Dept. Mathematics, Univ. Antwerp - UIA, Universiteitsplein 1, 2610 Wilrijk, Belgium  
7-21 August 1983 : Antwerp, Belgium

**TOPOLOGICAL METHODS IN NON-LINEAR ANALYSIS**

Prof. P. BERTHAUME, Dept. Math. - Statist., Univ., C.P. 6128, Succ. A, Montréal, Qué., Canada H30 3J7  
4-22 July 1983 : Montréal, Canada

**MAGNETO-STRUCTURAL CORRELATIONS IN EXCHANGE COUPLED SYSTEMS**

Dr. R.D. WILLETT, Dept. of Chemistry, Washington State Univ., Pullman, WA 99164, USA  
20 June-2 July 1983 : Maratea, Italy

**MOLECULAR LIQUIDS**

Dr. G.W. CHANTRY, National Physical Lab., Teddington, Middlesex, TW11 0LW, UK  
26 June-8 July 1983 : San Miniato, Italy

**CHEMISTRY OF MULTIPHASE ATMOSPHERIC SYSTEMS**

Dr. W. JAE SCHKE, Univ. Ctr. Environm. Protection, Robert-Mayer-Str. 11, 6000 Frankfurt A. Main 1, Germany  
26 September-8 October 1983 : Corfu, Greece

**QUANTUM CHEMISTRY OF POLYMERS**

Prof. J. LADIK, Lehrstuhl F. Theoret. Chemie, Univ. Erlangen-Nürnberg, Egerlandstr. 3, 8520 Erlangen, Germany  
25 July-5 August 1983 : Braunlage Harz, Germany

**SYNTHETIC MEMBRANES**

Dr. P.M. BUNGAY, Biomed. Eng. Instrum. Br., Nat. Inst. Health, Bldg 13, Rm. 3W13, Bethesda, MD 20205, USA  
26 June-8 July 1983 : Sintra Estoril (Alcabideche), Portugal

**NUCLEAR MAGNETIC RESONANCE OF LIQUID CRYSTALS**

Dr. J.W. EMSLEY, Chemistry Dept., The University, Southampton SO9 5NH, UK  
26 July-8 August 1983 : San Miniato, Italy

**SPECTROSCOPY OF BIOLOGICAL MOLECULES**

Prof. C. SANDORFFY, Univ., Dept. de Chimie, CP 6210, Succ. A, Montréal, Québec, Canada H3C 3V1  
3-16 July 1983 : Kavala-Thassos, Greece

**INTERACTING BINARIES**

Dr. P.P. EGGETON, Inst. of Astronomy, Madingley Road, Cambridge CB3 0HA, UK  
31 July-13 August 1983 : Cambridge, UK

**RELATIVITY GROUPS TOPOLOGY**

Mr. R. STORA, Division Théorique, CERN, 1211 Geneva 23, Switzerland  
27 June-5 August 1983 : Les Houches, France

**STATISTICAL EXTREMES AND ITS APPLICATIONS**

Prof. J. TIAGO DE OLIVEIRA, Dep. Estatística, 58, rua Escola Politécnica, 1294 Lisbon Cedex, Portugal  
31 August-14 September 1983 : Vimeira, Portugal

TECHNOLOGY ASSESSMENT, ENVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT •  
Dr. V.R.R. UPPULURI, Computer Sc. Division, Oak Ridge Nat. Labs., POB Y, Oak Ridge, TN 37830 USA  
22-31 August 1983 : Les Arcs, France

**INSURANCE PREMIUMS**

Dr. M. GOOVAERTS, K.U. Leuven, Dekenstraat 2, 3000 Leuven, Belgium  
18-31 July 1983 : Louvain, Belgium

**ROBOTICS AND ARTIFICIAL INTELLIGENCE ‡**

Dr. H.F. DAVIDSON, Office of Director Army Research, (DAMA-AR) Dept. of Army, Washington DC 20310, USA  
June 1983 : Italy

**GLASS CURRENT ISSUES ‡**

Dr. Josette DUPUY, Dept. Phys. Matériaux, Univ. Lyon I, 43 Bld 11 Nov. 1918, 69622 Villeurbanne Cedex France  
29 August-10 September 1983 : Corsica, France

**BOUNDARY ELEMENT TECHNIQUES IN COMPUTER AIDED ENGINEERING ‡**

Dr. C.A. BREBBIA, Inst. Computational Mech., Ashurst Lodge, Ashurst, Southampton SO4 2AA, UK  
August 1983 : Southampton, UK

**COMPUTER AIDED ANALYSIS AND OPTIMIZATION OF MECHANICAL SYSTEM DYNAMICS ‡**

Dr. E.J. HAUG, Ctr. for Computer Aided Design, Univ. Iowa, Iowa City, IA 52242, USA  
1-12 August 1983 : Iowa City, USA

**MODULATED STRUCTURE MATERIALS**

Dr. T. TSAKALAKOS, Dept. Materials Science, Rutgers Univ., POB 909, Piscataway, NJ 08854, USA  
15-25 June 1983 : Crete, Greece

**ENGINEERING OF SURFACE MODIFICATIONS OF MATERIALS ‡**

Dr. R. KOSSOWSKY, Westinghouse R&D Center, Pittsburgh, PA 15235, USA  
4-16 July 1983 : Les Arcs, France

**MOLECULAR BEAM EPITAXY AND HETEROSTRUCTURES ‡**

Dr. L.L. CHANG, IBM T.J. Watson Res. Ctr., POB 218, Yorktown Heights, NY 10598, USA  
6-19 March 1983 : Ence, Italy

**THE IMPACT OF PROCESSING TECHNIQUES ON COMMUNICATIONS ‡**

Dr. J.K. SKWIRZYNSKI, Marconi Res. Ctr., West Hanningfield Rd., Great Baddow, Chelmsford, CM2 8HN, UK  
11-22 July 1983 : Bonas, France

**COMPUTER ARCHITECTURES FOR SPATIALLY DISTRIBUTED DATA ‡**

Prof. G.G. PIERONI, Dip. di Matematica, Univ. della Calabria, 87036 Arcavacata di Rende (CS), Italy  
6-17 June 1983 : Crotone, Italy

**GEOSTATISTICS AS APPLIED TO NATURAL RESOURCES CHARACTERIZATION**

Prof. A.G. JOURNEL, Applied Earth Sc. Dept., Stanford Univ., Stanford CA 94305, USA  
4-17 September 1983 : South Lake Tahoe, California, USA

**ARWs****ANALYSIS OF QUALITATIVE SPATIAL DATA •**

Prof. P. NIJKAMP, Dept. of Economics, Free Univ., POB 7161, 1007 MC Amsterdam, The Netherlands  
28 March-1 April 1983 : Amsterdam, The Netherlands

**LASER PROCESSING IN MATERIALS SCIENCE • ‡**

Prof. L. LAUDE, Fac. des Sciences, Univ. de l'Etat, 23 Av. Maistriau, 7000 Mons, Belgium  
31 January-3 February 1983 : Mons, Belgium

**HIGH SPEED COMPUTATION •**

Prof. J.S. KOWALIK, Syst. & Computing, Washington State Univ., Pullman, WA 99163, USA  
20-22 June 1983 : Jülich, Germany

**HYBRID RAY-MODE FORMULATION OF WAVE PROPAGATION •**

Prof. L.B. FELSEN, Dept. Elect. Eng. & Computer Sc., Polytech. Inst., Rte 110, Farmingdale, NY 11735, USA  
Date to be announced : San Miniato, Italy

**CALIBRATION OF TRAFFIC CONFLICTS TECHNIQUES •**

Mr. E. ASMUSSEN, Inst. for Road Safety Res. - SWOV, Duindoorn 32, 2262 AR Leidschendam, The Netherlands  
25-27 May 1983 : Copenhagen, Denmark

**STRENGTH OF INORGANIC GLASS (Mat. S.) • ‡**

Dr. C.R. Kurkjian, Bell Labs., Murray Hill, NJ 07974, USA  
21-25 March 1983 : Armacao de Pera, Portugal

**WORKSHOP ON EDUCATIONAL MODULES (Mat. S.) •**

Dr. J.H.W. DE WIT, Dept. Inorganic Chem., Rijksunivers., 77a Croesestraat, 3522 AD Utrecht, The Netherlands  
October 1983 : Greece

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

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# "Science Is Sciencing"

"Science is not merely a collection of facts and formulas. It is preeminently a way of dealing with experience." Thus wrote the late Leslie A. White, when he concluded in an important essay\* that "science is sciencing." Today, as we consider how to improve the public understanding of science, it seems useful once more to point out that the social, cultural, and behavioral domains are as much a part of the universe as are the physical and biological, and if we are to have the kind of understanding and predictive power science can give us, we must teach our children to consider social facts as things and to treat them as such, as Emile Durkheim suggested.

As we struggle to improve the science curriculum in our schools and colleges, we tend to focus on mathematics—with which no one can quarrel, since it is one of the languages all scientists use in expressing the relationships they observe and postulate between variables. New developments such as catastrophe theory, for example, hold great promise for bringing greater rigor to our understanding of social and behavioral events. But is it sensible to present other subject matter by discipline, as though it were possible to subdivide the universe into phenomena which are subject to scientific investigation and those which are not? Even though most (but not all) physical and biological scientists give at least lip service to the possibility of "social science," and it is true that the social sciences are represented in the National Science Foundation and the National Academy of Sciences, it is nevertheless the case that social facts in the schools tend to be presented as "social studies" rather than as science.

Now, this distinction has the potential advantage of indicating that there are also humanistic and artistic ways of interpreting sociocultural phenomena (just as there are, of course, for sunsets, earthquakes, icebergs, stars, or the human body), but unfortunately the scientific element in social studies often gets lost. Too often, popular and schoolroom discussions of social phenomena are cast in emotional terms which lead people of all ages and educational levels to confuse their own values about what ought to be with what is or what might be. Politicians sometimes find it convenient to bolster their positions by reference to the findings of social scientists, sometimes inappropriately. This leads some to declare that social science cannot or should not be used in policy formation, since it is all "subjective" anyway.

It is not subjective, of course, but it is apparently very difficult, even for the scientifically sophisticated, to keep in mind that there is an external social and cultural world independent of the perceiving subject, a belief which, as Einstein said, is the basis of all natural science. Furthermore, there is a distinct tendency to seek explanations of things and events in the social and cultural domain in the actions of particular individuals—the "great man" or the all-powerful tyrant. Even the educated and highly credentialed may be so ignorant of what social science is all about that they see science only in the dating or identification of artifacts, or in the demonstration of statistical correlations, such as those between divorce and educational level or between crime and urban congestion. These views are often enhanced by the selection of topics presented as social science in the popular press, even the scientific popular press.

What is desperately needed is a better understanding of how rigorous, impartial investigation of social and cultural facts, including acts, objects, ideas, and sentiments, leads to increased knowledge of the patterns and processes which affect how we and others think and behave. How we use our knowledge is a completely different matter and should not be confused with scientific discovery and analysis. If there is order anywhere, it is everywhere. And if we are to discover it, we must improve our scientific capabilities across the board.—NANCIE L. GONZALEZ, *University of Maryland, College Park 20742*

\**Philosophy of Science*, vol. 5, pp. 369–389 (1938).



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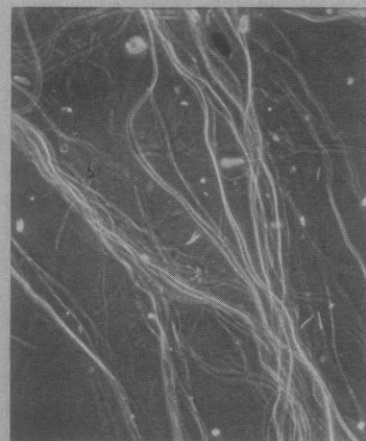
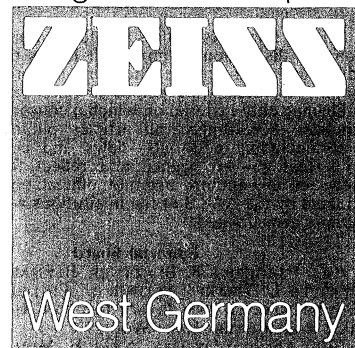
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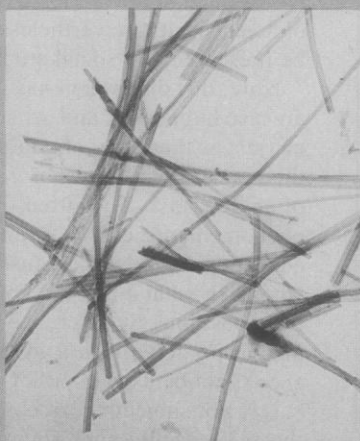
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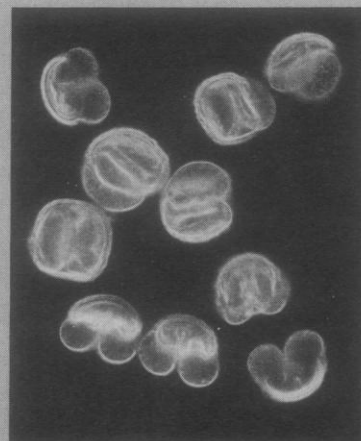
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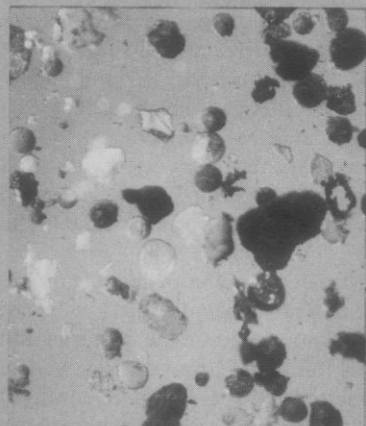
1: Chrysotile asbestos. Phase contrast 220x.



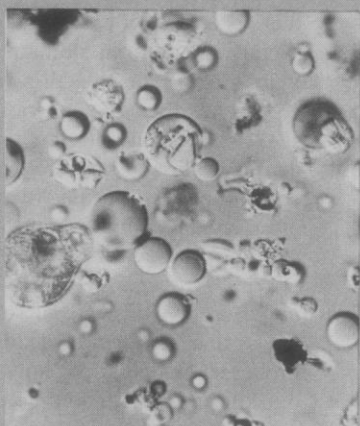
2: Chrysotile asbestos. Electron micrograph 9,500x.



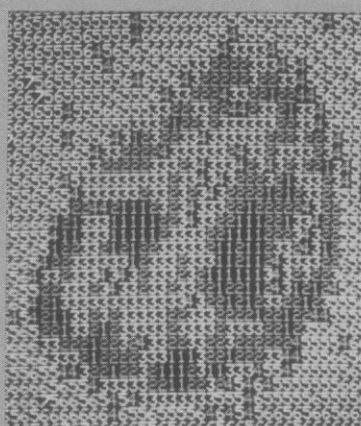
3: Pine pollen. Darkfield 220x.



4: Fly ash. Combination of slightly uncrossed polarizers and reflected light 35x.



5: Fly ash. Nomarski Differential Interference Contrast 620x.



6: Greylevel distribution display of dust particles.

Photos 1, 2, 3 and 4 by John G. Delly, Senior Research Microscopist, McCrone Research Institute.

Photo 5 by Dr. Robert F. Smith, Director of Biomedical Communications, New York State College of Veterinary Medicine, Cornell University.

Photo 6 from Zonax screen.