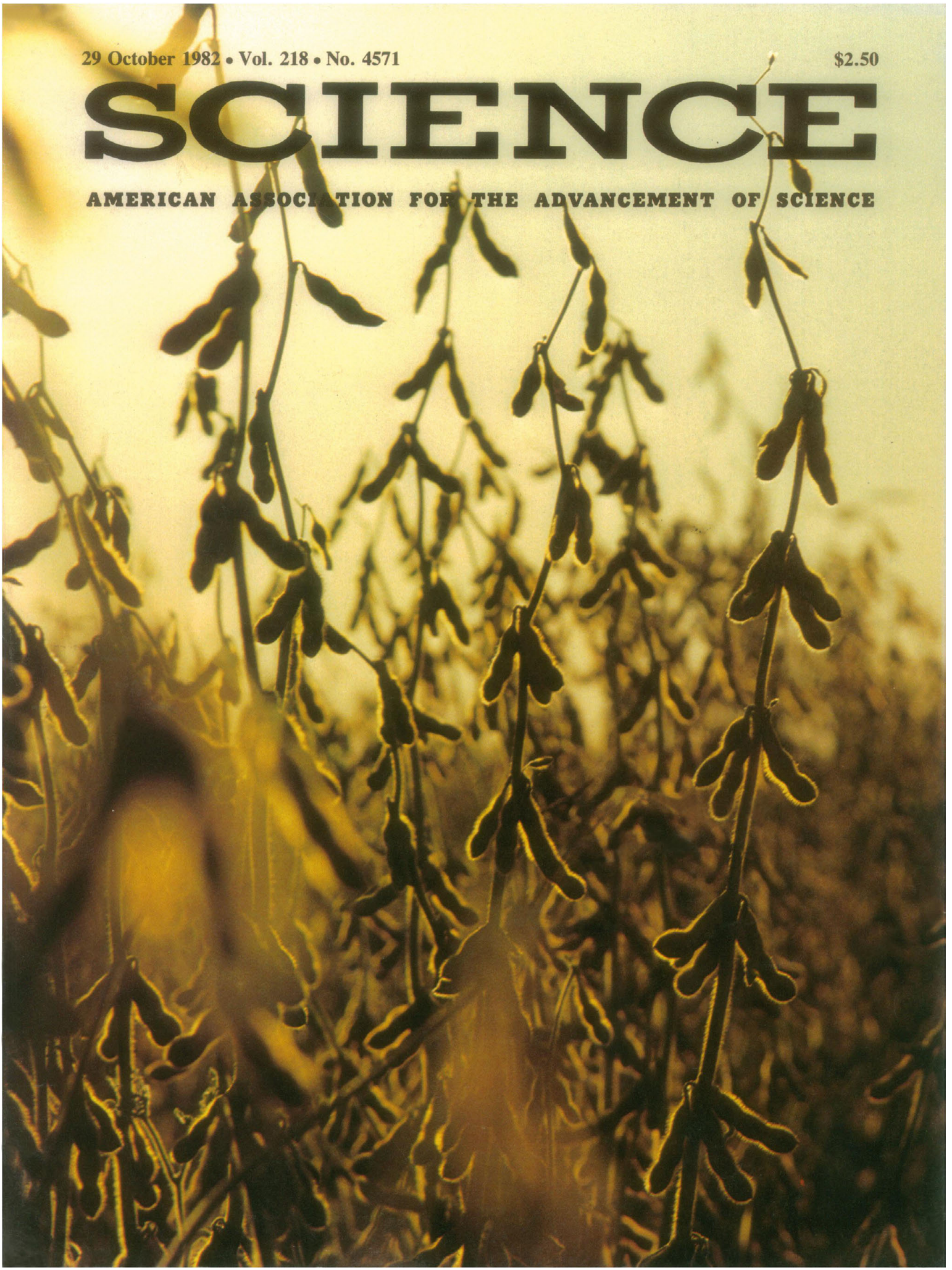
29 October 1982 • Vol. 218 • No. 4571 $2.50

SCIENCE

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



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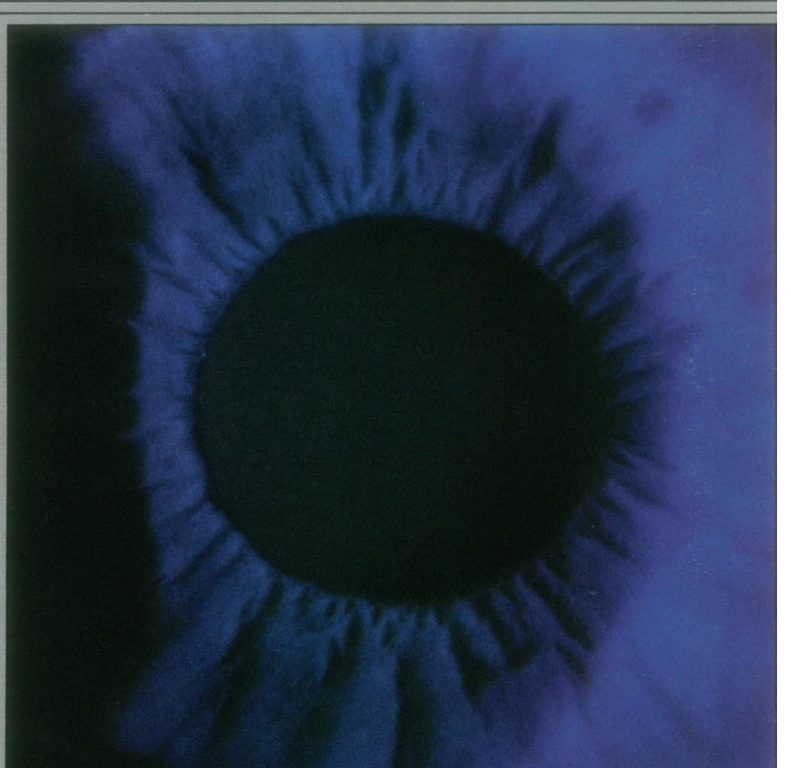

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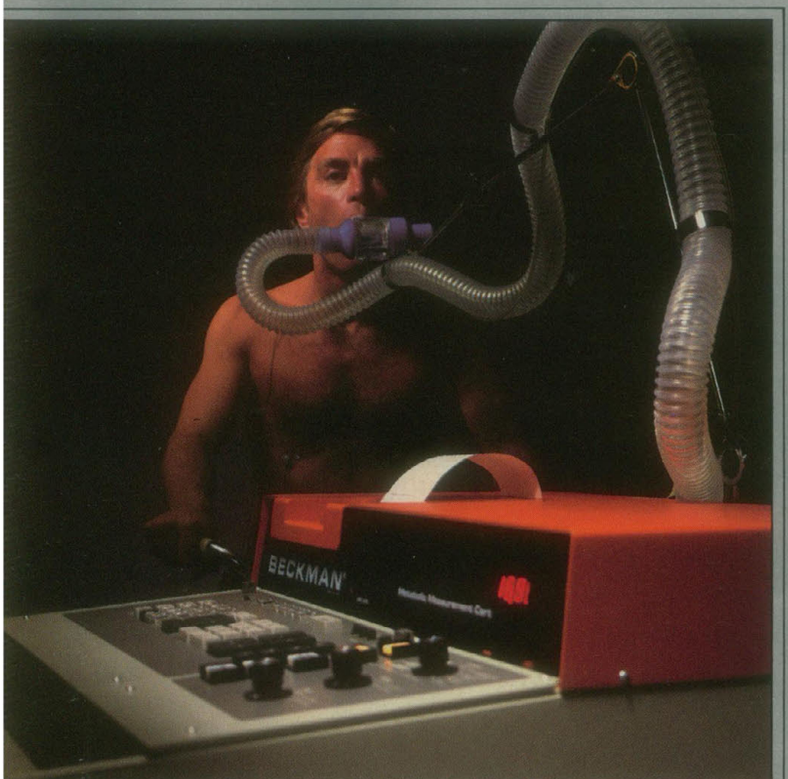

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Technologies

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Volume 218, No. 4571

SCIENCE

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Announcement–Academic Year 1982-1983

NSF Chautauqua Short Courses for College Teachers

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Schedules at Regional Field Centers

In 1982-83, several scientific research laboratories and observatories throughout the United States are hosting Chautauqua short courses taught by researchers on their staff. Applications for these courses will be processed by the Regional Field Centers. Also, five courses will be held at professional meetings and four at selected special locales.

Western Circuit

OGC — Oregon Graduate Center for Study and Research, Nicholas J. Eror, Department of Materials Science. 19600 N.W. Walker Road, Beaverton, Oregon 97006. Tel: (503) 645-1121.

2-4 Nov Advances in Coherent Optical Science and Engineering, **Brian J. Thompson**

10-12 Nov Toxic Substances in the Environment, **William Hadley** and **David Kidd**

15-17 Nov Technology, Arms Control, and National Security: Issues and Choices, **Richard Scribner**

9-11 Mar Geological and Physical Oceanography and Technology, **Victor T. Neal** (at the School of Oceanography, Oregon State University, and its Marine Science Center in Newport.)

16-18 Mar Soft Energy Paths: How to Enjoy the Inevitable, **Amory** and **Hunter Lovins**

30 Mar-1 Apr Design and Analysis of Passive Solar Energy – Efficient Buildings, **George Tsongas**

7-9 Apr A Laboratory/Lecture Approach to Microcomputer Education, **David Larsen** and **Paul E. Field**

ANA — Santa Ana College, Carolyn Breeden, 17th at Bristol, Santa Ana, California 92706. Tel: (714) 667-3279.

27-29 Oct Risk–Benefit Analysis, **Chris Whipple**

3-5 Nov Science, the Media, and the Public, **Sharon Dunwoody** and **Carol L. Rogers**

15-17 Nov Ocean Variability and Its Impact on Living Resources, **Richard E. Pieper** (at the University of Southern California Institute for Marine and Coastal Studies, Catalina Marine Science Center, Catalina Island, California.)

6-8 Dec Plate Tectonics: History Of and Evidence For, **Peter J. Wyllie**

14-16 Mar The Personalities of 20th Century Physics: Their Interactions & Struggles, **Max Dresden**

13-15 Apr Calculus for Non – Majors in the Physical Sciences, **Robert A. Rosenbaum**

UUT — University of Utah, E. Allan Davis, Department of Mathematics, Salt Lake City, Utah 84112. Tel: (801) 581-5809.

11-13 Nov Science, Technology, and Arms Control, **Lester G. Paldy**

24-26 Feb Food, Energy, and Society, **David Pimentel**

3-5 Mar Genetics and Society: A Dynamic Interaction, **Robert F. Murray, Jr.**

10-12 Mar Thermodynamics, Art, Poetry, and the Environment, **Henry Bent**

24-26 Mar Personal Computers and Learning in Science, **Stephen Franklin**

10-12 Jun Ecology of Terrestrial Microcommunities, **Daniel Dindal** (at the joint Annual Meeting in 1983 of the AAAS Pacific Division and the AAAS Southwestern and Rocky Mountain Division, Logan, Utah.)

TXA — University of Texas at Austin, James P. Barufaldi, Science Education Center, EDB 340, Austin, Texas 78712. Tel: (512) 471-7354.

1-3 Nov Reproductive Biology of the Flowering Plants, **B.J.D. Meeuse**

15-17 Nov The Personalities of 20th Century Physics: Their Interactions & Struggles, **Max Dresden**

3-5 Mar Science, Technology, and Arms Control, **Lester G. Paldy**

10-12 Mar The Evolution of Life on a Dynamic Earth, **James Valentine**

16-18 Mar Ecology of Terrestrial Microcommunities, **Daniel Dindal** (at Little St. Simon's Island, Georgia, a semi-tropical island near Brunswick, Georgia.)

5-7 Apr Astronomy Bizarre, **R. Edward Nather** (at the 1983 National Convention of NSTA, Dallas, Texas.)

4-6 May Topics in Current Solar Research, **Jack N. Zirker,** et al. (at the Sacramento Peak Observatory, Sunspot, New Mexico.)

Central Circuit

UIA — University of Iowa, Robert E. Yager, Science Education Center, 450 Physics Building, Iowa City, Iowa 52240. Tel: (319) 353-4921.

8-10 Nov The Search for Human Origins, **John Cronin** and **Alan J. Almquist**

22-23 Nov/ 24-25 Mar* Historical Foundations of Modern Science, **Duane H.D. Roller (at the University of Oklahoma, site of the University's History of Science Collections.)

21-23 Feb Ecology of Terrestrial Microcommunities, **Daniel Dindal**

23-25 Mar Combinatorial Problem – Solving in the Mathematical Sciences, **Alan Tucker**

28-30 Mar Microcomputers as Laboratory Tools, **Rex L. Berney**

4-6 Apr Calculus for Non–Majors in the Physical Sciences, **Robert A. Rosenbaum**

25-27 Apr Soft Energy Paths: How to Enjoy the Inevitable, **Amory** and **Hunter Lovins**

PAR — Parkland College, Delores C. Schoen, Life Science Division, 2400 W. Bradley Avenue, Champaign, Illinois 61820. Tel: (217) 351-2465.

4-6 Nov The Evolution of Life on a Dynamic Earth, **James Valentine**

11-13 Nov Remote Sensing of the Earth: Concepts and Applications, **Stephen G. Ungar** and **Samuel Goward**

3-5 Mar Food, Energy, and Society, **David Pimentel**

10-12 Mar Toxic Substances in the Environment, **William Hadley** and **David Kidd**

17-19 Mar Reproductive Biology of the Flowering Plants, **B.J.D. Meeuse**

24-26 Mar Mechanisms of Drug Action, **Philip C. Hoffman**

7-9 Apr Population: Demographic Processes and Techniques of Analysis, **Leon Bouvier**

16-18 May Pulsed NMR Spectroscopy — An Introduction, **R. B. Clarkson** (at the Laboratory for Molecular Spectroscopy, University of Illinois, Urbana-Champaign.)

DAY — University of Dayton, George K. Miner, Chautauqua Field Center, Department of Physics, Dayton, Ohio 45469. Tel: (513) 229-2327.

1-2 Nov/ 24-25 Feb* Personal Computers and Learning in Science, **Stephen Franklin

4-5 Nov/ 10-11 Mar* Microcomputers as Laboratory Tools, **Rex L. Berney

17-19 Nov Astronomy Bizarre, **R. Edward Nather**

22-23 Nov/ 7-8 Mar* Advances in Coherent Optical Science Engineering, **Brian J. Thompson

2-4 Mar Cognition and Teaching, **Ruth S. Day**

23-25 Mar Genetics and Society: A Dynamic Interaction, **Robert F. Murray, Jr.**

13-15 Apr Science, Technology, and Arms Control, **Lester G. Paldy**

11-13 May Natural and Artificial Photosynthesis, **Joseph J. Katz** (at the Argonne National Laboratory, Argonne, Illinois.)

CBC — Christian Brothers College, John Edward Doody, Division of Science and Mathematics, 650 East Parkway South, Memphis, Tennessee 38104. Tel: (901) 278-0100, Ext. 227.

21-23 Oct Remote Sensing of the Earth: Concepts and Applications, **Stephen G. Ungar** and **Samuel Goward**

28-30 Oct Cognition and Teaching, **Ruth S. Day**

4-6 Nov Personal Computers and Learning in Science, **Stephen Franklin**

11-13 Nov Microcomputer Interfacing for the Undergraduate Laboratory, **Albert S. Woodhull**

15-17 Nov Combinatorial Problem–Solving in the Mathematical Sciences, **Alan Tucker**

3-5 Mar The Search for Human Origins, **John Cronin** and **Alan J. Almquist**

7-9 Apr Mass Spectrometry: Theory and Applications, **Michael L. Gross, Frank W. Crow,** and **Kenneth B. Tomer** (at the Midwest Center for Mass Spectrometry, University of Nebraska, Lincoln.)

21-23 Apr Science, Technology, and Arms Control, **Lester G. Paldy**

Eastern Circuit

UGA — University of Georgia, W. R. Zeitler, Department of Science Education, Athens, Georgia 30602. Tel: (404) 542-1763.

2-4 Mar Immunobiology: Evolutionary, Developmental, and Molecular Perspectives, **Richard A. Goldsby** (at the University of Puerto Rico, Rio Piedras, for faculty from Puerto Rico and the Virgin Islands.)

2-4 Mar Industrial Organic and Pharmaceutical Chemistry in College Chemistry Teaching, **Harold Wittcoff** (at the University of Puerto Rico, Rio Piedras, for faculty from Puerto Rico and the Virgin Islands.)

9-11 Mar Plate Tectonics: History Of and Evidence For, **Peter J. Wyllie**

16-18 Mar Ecology of Terrestrial Microcommunities, **Daniel Dindal** (at Little St. Simon's Island, Georgia, a semi-tropical island near Brunswick, Georgia.)

24-26 Mar Science, the Media, and the Public, **Sharon Dunwoody** and **Carol L. Rogers**

30 Mar-1 Apr Reproductive Biology of the Flowering Plants, **B.J.D. Meeuse**

20-22 Apr Chemical Communication Among Animals: Biology, Methodology, and Applications, **Gerald N. Lanier**

27-29 Apr A Laboratory/Lecture Approach to Microcomputer Education, **David Larsen** and **Paul E. Field** (at the 60th Annual Meeting of the American Institute of Chemists, Atlantic City, New Jersey)

24-26 May Science and . . . : Interdisciplinary Approaches to Teaching Science, **Andrew Fraknoi** and **Alan J. Friedman** (at the 1983 Annual Meeting of the AAAS, Detroit, Michigan.)

24-26 May Microcomputers in the Laboratory, **Robert Tinker** (at the 1983 Annual Meeting of the AAAS, Detroit, Michigan.)

TUCC — Temple University, Leonard Muldawer, Chautauqua Short Course Program, Barton Hall BA-407, Philadelphia, Pennsylvania 19122. Tel: (215) 787-7668. Courses will be conducted at Temple University Center City (TUCC).

10-12 Nov Population: Demographic Processes and Techniques of Analysis, **Leon Bouvier**

10-12 Nov Energy and Society, **George Tsongas**

18-20 Nov Science, Technology, and Arms Control, **Lester G. Paldy**

28 Feb-2 Mar Personal Computers and Learning in Science, **Stephen Franklin**

30 Mar-1 Apr Mechanisms of Drug Action, **Philip C. Hoffmann**

4-6 Apr Life in the Oceans, **Eugenie Clark**

14-16 Apr Industrial Organic and Pharmaceutical Chemistry in College Chemistry Teaching, **Harold Wittcoff**

10-12 May The Radio Universe, **Martha P. Haynes** (at the National Radio Astronomy Observatory, Green Bank, West Virginia.)

POL — Polytechnic Institute of New York, Bernard J. Bulkin, Polytechnic/Westchester, 456 North Street, White Plains, New York 10605. Tel: (914) 949-1775.

3-5 Nov Cosmology: The Origin, Evolution, and Future of the Universe, **David N. Schramm**

15-17 Nov Microcomputers in the Laboratory, **Robert F. Tinker**

17-19 Nov The Search for Human Origins, **John Cronin** and **Alan J. Almquist**

12-14 Jan Modern Laser Spectroscopy, **Staff of the Regional Laser Center** (at the MIT Regional Laser Center.)

6-8 Apr Qualitative Physics, **Victor F. Weisskopf**

HAM — Hampshire College, Kenneth R. Hoffman/Jim Matlack, Chautauqua Program/CA, Amherst, Massachusetts 01002. Tel: (413) 549-4600, ext. 561.

6-8 Oct Microcomputer Interfacing for the Undergraduate Laboratory, **Albert S. Woodhull**

19-21 Oct Immunobiology: Evolutionary, Developmental, and Molecular Perspectives, **Richard A. Goldsby**

27-29 Oct Technology, Arms Control, and National Security: Issues and Choices, **Richard Scribner**

9-11 Mar Cells and Evolution, **Lynn Margulis**

6-8 Apr Science and. . .: Interdisciplinary Approaches to Teaching Science, **Andrew G. Fraknoi** and **Alan J. Friedman**

For further information (course descriptions, applications, etc.) please write or call one of the Regional Field Centers. Information is also available from the

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29 October 1982, Volume 218, Number 4571 **SCIENCE**

Efforts to Decrease Nuclear Tensions

So far we have been spared from nuclear war, but year by year the number and accuracy of nuclear weapons have increased. Should the present race continue indefinitely, the ultimate mutual destruction of the superpowers seems guaranteed. The United States and the Soviet Union now have about 25,000 warheads each. Only about 200 on target would destroy all U.S. cities with populations greater than 100,000. Russian casualties would be comparable. In addition, the Soviet Union has some special problems of its own. The European Russians (Caucasians) constitute an unloved minority. One Kremlinologist told me that if a bomb were dropped on Moscow, there would be dancing in the streets of Tashkent. Following a nuclear holocaust, how much help could Russians expect from their neighbors? According to another Kreminologist, "The Soviet Union is the only major power in the world almost totally surrounded by hostile communist powers." Though the country's intrinsic position is flawed, the Russians are a proud people and their leadership acts tough and brutal. Another Kremlinologist has said, "The Russians are not 20 feet tall, but neither do they have a 10-foot yellow streak down their backs." An attempt by this country to overawe them is not likely to succeed. The contrasting policy for us—unilateral disarmament—has no future. Realism demands a middle course between the two extremes. Increasingly, important voices have been calling for just that.

In this issue of *Science* is printed a Declaration on Prevention of Nuclear War that was presented to Pope John Paul II by an assembly of presidents of scientific academies and other scientists. Circumstances of the drafting of the declaration indicate that its recommendations will be adopted, entirely or in large part, by the Catholic Church. A crucial comment made in the declaration is that "All disputes that we are concerned with today, including political, economic, ideological, or religious ones, are small compared to the hazards of nuclear war." This statement is true, but are our people prepared to modify firmly held beliefs to lessen tensions?

The declaration calls on all nations "never to be the first to use nuclear weapons; . . . to abide by the principle that force or the threat of force will not be used against the territorial integrity or political independence of another state; . . . [and] to renew and increase efforts to reach verifiable agreements curbing the arms race." A commitment by the United States not to be first to use nuclear weapons would represent an important change in policy that might leave our NATO allies feeling abandoned. At present, the Russians have a large superiority in tanks and other conventional weapons. To neutralize this threat would require a substantial buildup of Western conventional forces or partial disarmament by the Russians.

The other two cited recommendations also call for a change in the behavior of the Soviet Union. Would they be willing to curtail their activities in Afghanistan and elsewhere? The matter of verifiability is also sticky. The historical refusal of the Russians to agree to some form of inspection casts doubt on their reliability and sincerity.

Despite the many obstacles to lessening the threat of nuclear war, efforts must be made. Scientists can help, as they have done in advising Pope John Paul II. But the major impetus must come from the politicians. In this regard there have been some encouraging developments. Four former hawks, McGeorge Bundy, George F. Kennan, Robert S. McNamara, and Gerard Smith, have called for a change in policy on the use of nuclear deterrents in Western Europe.* Senators Jake Garn (R–Utah) and Paul Laxalt (R–Nev.) have said, "The U.S. should make every effort to negotiate an equitable and verifiable strategic nuclear offensive arms reduction agreement." Senator Barry Goldwater (R–Ariz.) said that it is time to sit down with the Russians and say, "We're both in trouble. We're spending too damn much on things we don't need. Let's talk."—PHILIP H. ABELSON

*"Nuclear Weapons and the Atlantic Alliance," reprinted from *Foreign Affairs*, Spring 1982, by the Albert Einstein Peace Prize Foundation, 1430 West Wrightwood Avenue, Chicago 60614.

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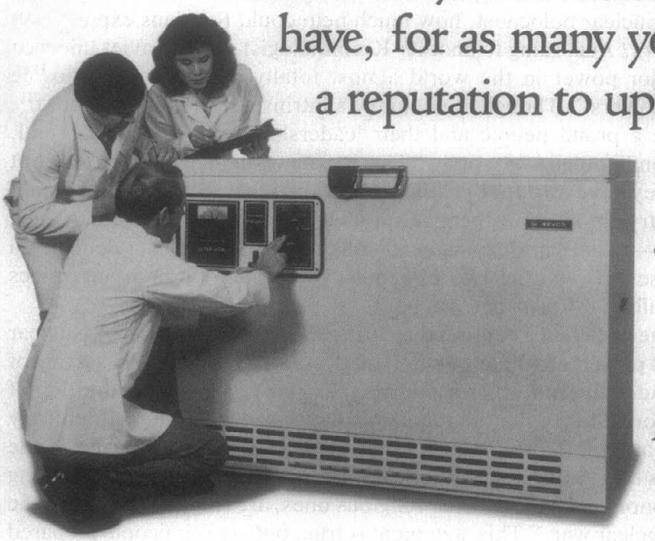

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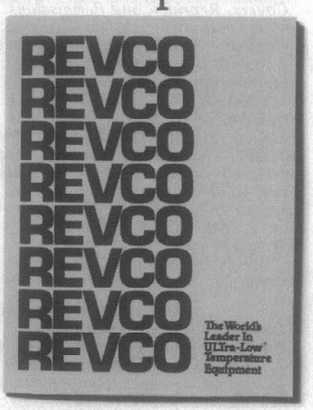

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