American Association for the Advancement of Science

SCIENCE

8 June 1990
Vol. 248 ■ Pages 1165–1264
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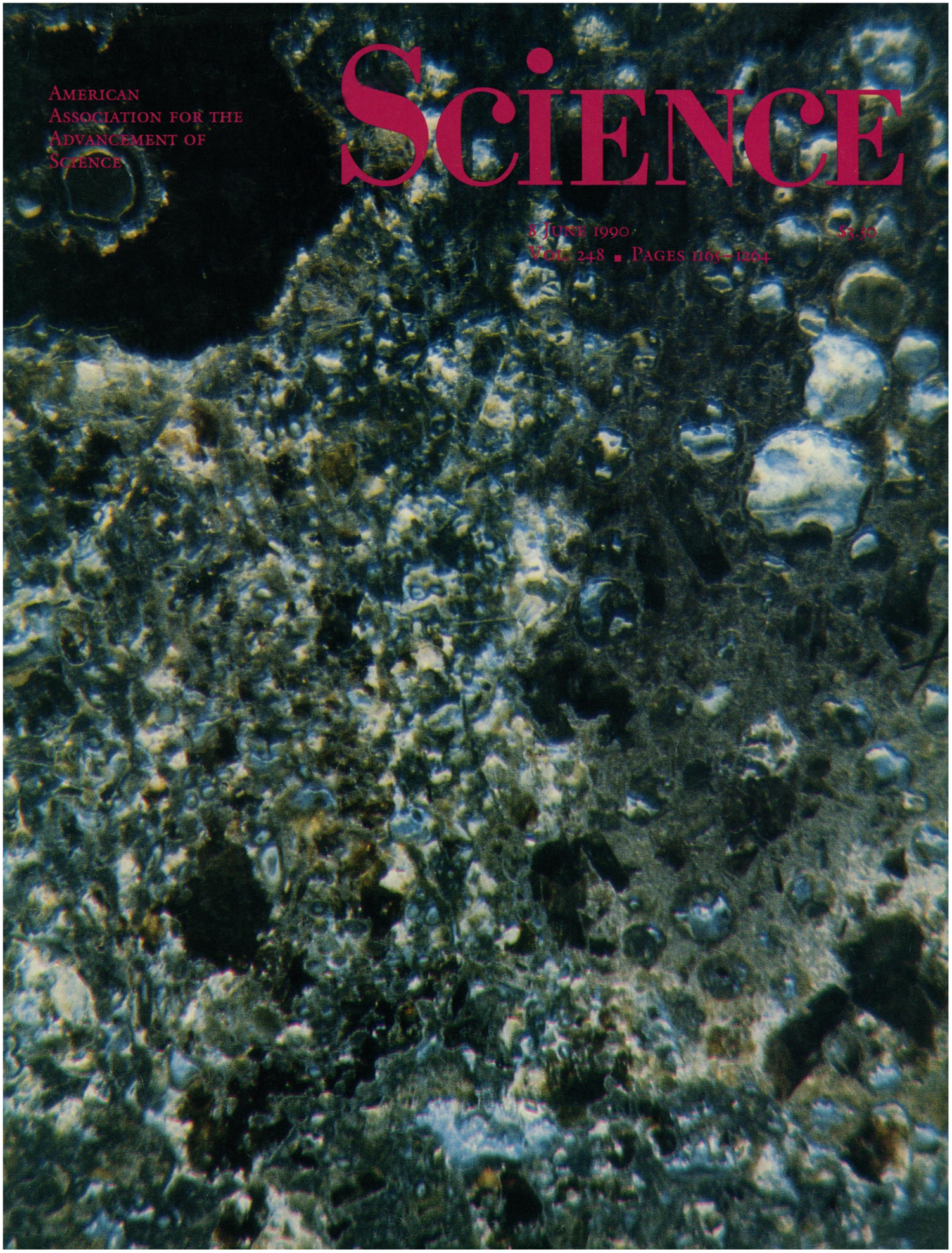

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*Mardis, E.R., Roe, B.A. Automated methods for single-stranded DNA isolation and dideoxynucleotide DNA sequencing reactions on a robotic workstation. *BioTechniques 7*, 840-850 (1989)

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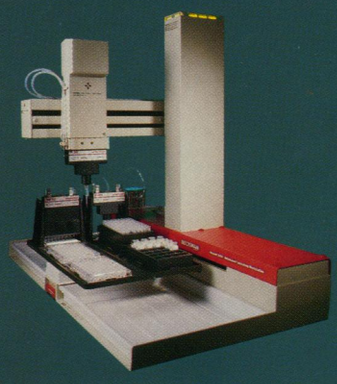
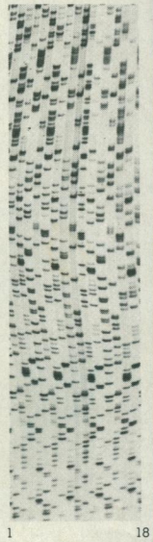


Figure 1

Figure 2



1 18

Figure 1. Autoradiogram of sequence analyses accomplished on the Biomek 1000 using GemSeq K/RT double-stranded DNA sequencing system and Riboprobe Gemini pGEM-3 vector, containing an insert of a known cDNA.

Figure 2. Autoradiogram of sequence analyses using M13mp18. Lanes 1-9 were performed manually, lanes 10-18 were performed on the Biomek 1000.

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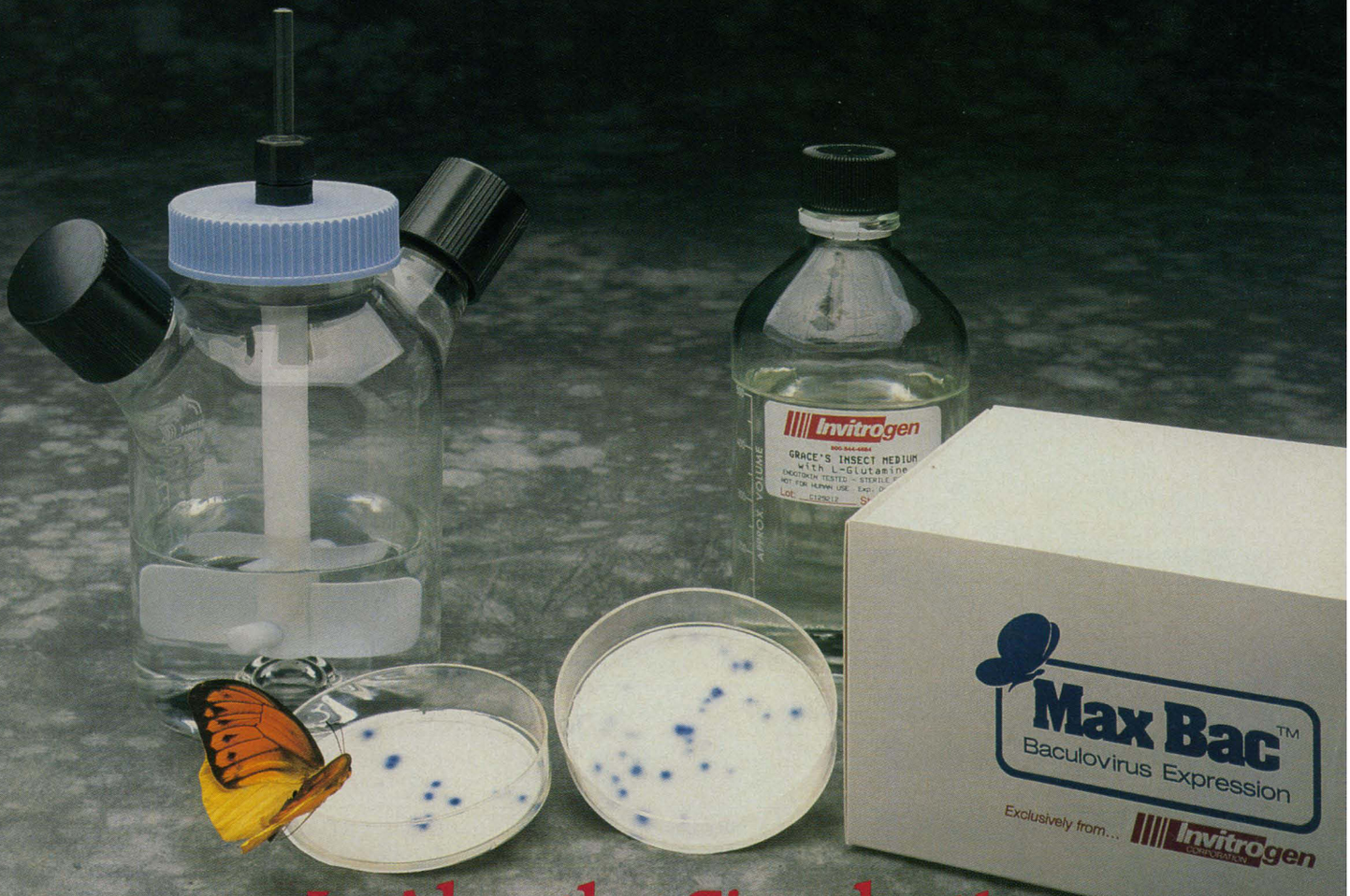

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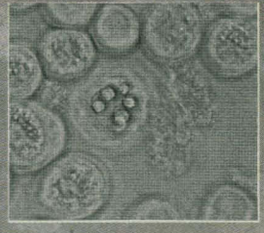

Figure 1. Infected Sf9 insect cells showing viral occlusions.

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Luckow, V. and Summers, M. (1988) Biotechnology 6, 47-55

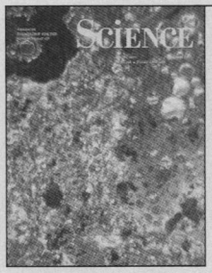
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

SCIENCE

ISSN 0036-8075
8 JUNE 1990
VOLUME 248
NUMBER 4960

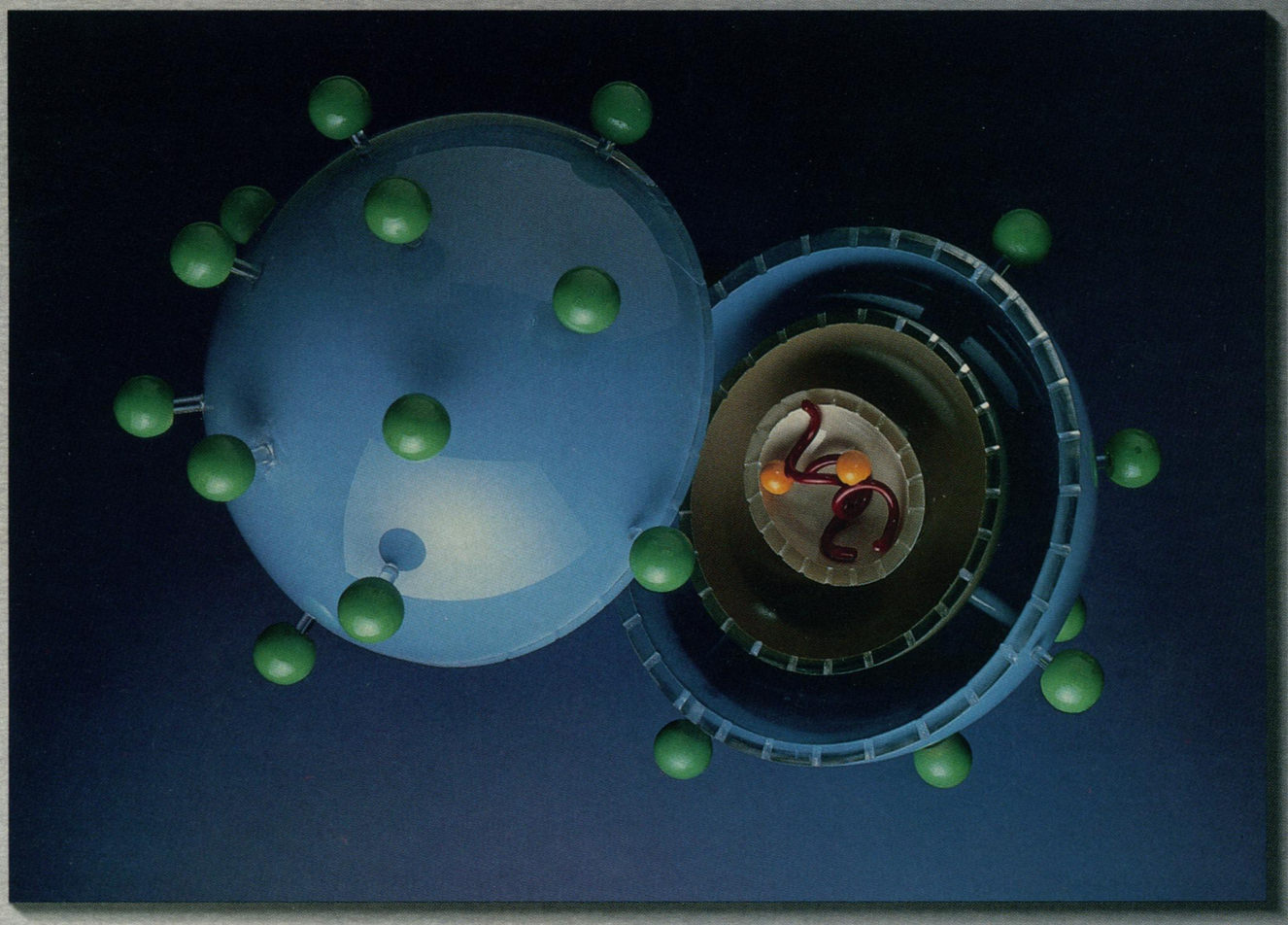
■ **SCIENCE is published weekly on Friday, except the last week in December, and with a supplement in March by the American Association for the Advancement of Science, 1333 H Street, NW, Washington, DC 20005.** Second-class Non-profit postage (publication No. 484460) paid at Washington, DC, and at an additional entry. Domestic individual membership and subscription (51 issues): $80. Domestic institutional subscription (51 issues): $150. Foreign postage extra: Canada $46, other (surface mail) $46, air mail via Amsterdam $85. First class, airmail, school-year, and student rates on request. **Single copy sales**: Current issue, $3.50; back issues, $5.00; Biotechnology issue, $6.00 (for postage and handling, add per copy $0.50 U.S., $1.00 all foreign); Guide to Biotechnology Products and Instruments, $20 (for postage and handling add per copy $1.00 U.S., $1.50 Canada, $2.00 other foreign). Bulk rates on request. **Authorization to photocopy** material for internal or personal use under circumstances not falling within the fair use provisions of the Copyright Act is granted by AAAS to libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that the base fee of $1 per copy plus $0.10 per page is paid directly to CCC, 27 Congress Street, Salem, Massachusetts 01970. The identification code for *Science* is 0036-8075/83 $1 + .10. **Change of address:** allow 6 weeks, giving old and new addresses and 11-digit account number. **Postmaster:** Send Form 3579 to *Science*, P.O. Box 1723, Riverton, NJ 08077. *Science* is indexed in the *Reader's Guide to Periodical Literature* and in several specialized indexes.

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



COVER Polished surface of a submarine basalt breccia formed by explosions >1800 meters below sea level south of Japan. The clast on the right may be accidental but the surrounding matrix quenched and welded during the submarine eruption. The matrix consists of basalt glass shards with vesicles 0.1 to 0.2 millimeter in diameter. See page 1214. [Shipboard photograph by C. Galida, Ocean Drilling Program. Sample is ODP Leg 126 791B-66R-2, piece 1c; field of view is 1.2 centimeters by 1.8 centimeters.]

New HIV p24 Core Profile ELISA... unsurpassed sensitivity *and* specificity



Sensitivity: Du Pont's HIV p24 Core Profile ELISA (NEK-060) kit detects as little as one picogram of HIV p24 antigen in serum, plasma or tissue-culture supernatant samples in less than four hours.

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This Week in SCIENCE

Getting the lead in

ELECTRONIC and structural properties of the bismuth-lead-oxygen layer of a superconductor change as lead atoms are inserted, but analyses with scanning tunneling microscopy and scanning tunneling spectroscopy indicate that these changes are not sufficient to alter the intrinsic superconducting properties of the material (page 1211). In the early studies of high-temperature superconducting materials, lead was among the first metal substituents to be added to superconducting materials, and it was helpful in assessments of the properties of superconductors and in the development of superconducting materials with increasingly high onset temperatures. Wu *et al.* find that in high-temperature superconductors of the type $Pb_xBi_{2-x}Sr_2CaCu_2O_8$ lead gets randomly inserted in the bismuth-lead-oxygen layer where it distorts the one-dimensional superlattice; extra oxygen atoms also get incorporated into the bismuth-oxygen lattice. Because the added lead does not significantly perturb the electronic properties of the layer, this layer may only be important to structure but not to functioning of $Pb_xBi_{2-x}Sr_2CaCu_2O_8$ superconductors.

Bombardier beetles

MUCH like a World War II "buzz bomb," the bombardier beetle produces a rapid-fire series of defensive sprays as it battles its enemies (page 1219). Acoustical measurements (little pops are produced with each burst), electrical recordings of the defensive emissions hitting a small force transducer, and high-speed photographs show that the bombardier beetle responds to threats with a *p*-benzoquinone spray that is released intermittently, at a rate that has been clocked at about 500 pulses per second. Hydroquinones and hydrogen peroxide are stored in muscular reservoirs in the beetle's abdomen; the reservoirs contract and force the fluids through a valve into a thick-walled reaction chamber that contains a number of oxidative enzymes; there, explosive chemical reactions occur and fine hot mists of *p*-benzoquinones are emitted. Flexibility in the abdominal tip, described as resembling that of a revolvable turret, permits spraying in any direction. A pulsed delivery system of this sort has a number of mechanical and biochemical advantages over a continuous one, and these are discussed by Dean and co-workers.

Viral mimicry of host defense

REMARKABLE homology between genes of a virus and its animal host has led to a proposal that the virus may be exploiting a captured host gene for enhancing its own survival (page 1230). The homologous genes are the BCRF1 gene of the Epstein-Barr virus and the mouse gene CSIF. CSIF expression in mouse T_H2 helper cells leads to the production of a substance that inhibits cytokine production by T_H1 helper cells. The T_H1 and T_H2 cells appear to be mutually inhibitory immunoreactive cells. Moore *et al.* describe the close structural resemblance of the CSIF gene—which they isolated, cloned, and characterized—to BCRF1. They propose that the BCRF1 gene product that is made by the Epstein-Barr virus may act like the CSIF gene product: it might block activities of the T_H1 cells of the host and thereby alter the type of immune response that the host is able to make. The co-opting of host immunoregulatory genes might be a strategy used by a variety of pathogens, not just Epstein-Barr viruses, for improving their chances of survival.

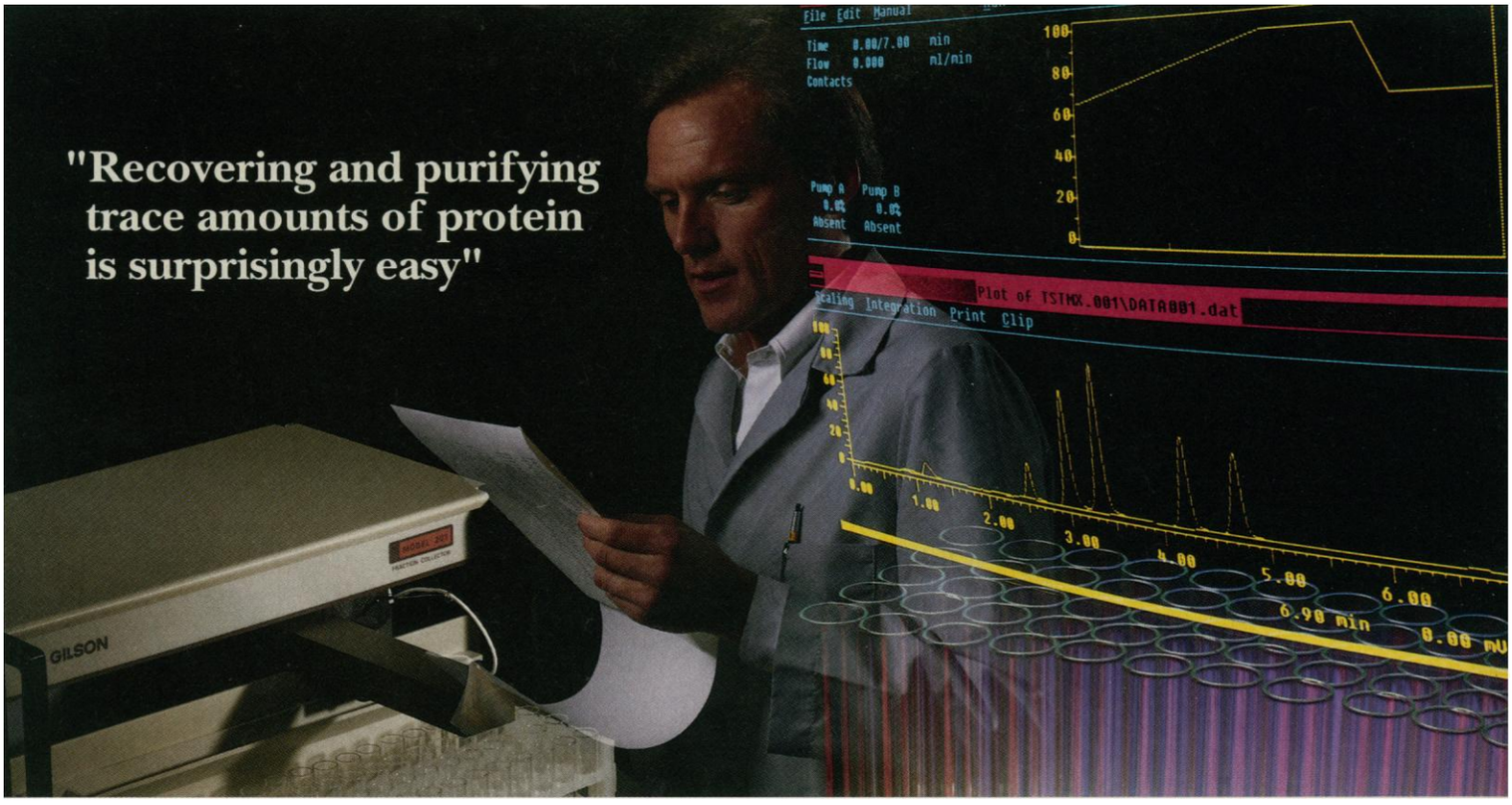
Human trial of AIDS subunit vaccine

IMMUNIZATIONS—four shots in 18 months—of human volunteers with a "subunit" vaccine made from the AIDS virus HIV-1 has induced immune responses that result in the killing of HIV-1–infected cells (page 1234). The vaccine contains the HIV-1 envelope precursor protein gp160 produced with recombinant DNA technology. The responding T lymphoid cells, though not typical of T cells that are elicited by natural HIV-1 infections, nonetheless could kill actively infected host cells. Interest in subunit vaccines stems from the fact that they are simpler to make and safer to use than vaccines that contain live attenuated viruses; however, the effectiveness of subunit vaccines ultimately depends on the ability of the soluble materials they contain to elicit immune responses that will counter naturally occurring infections by live viruses. Also, it is thought that the most efficacious vaccines will be those that can protect against cross-reacting HIV-1 strains. The initial observations of Orentas *et al.* suggest that the recombinant gp160 preparation is capable of inducing specific, cross-reacting, and clinically relevant immune responses.

Keeping pace

CIRCADIAN rhythms of mammals must be adjusted each day to the sun's 24-hour cycle because the mammalian "free-running" period is longer than a day. The adjustment is brought about daily by light, which hits the retina of the eye, activates the optic nerves, and adjusts the firing and metabolism of cells in the pacemaking suprachiasmatic nucleus in the hypothalamus of the brain. Gene expression in these cells and in other cells known to be involved in the adjustment or entrainment of the rhythm has been studied by Rusak *et al.* in rats and hamsters. When light pulses were given at certain times in the daily cycle—those times when the animal's rhythm is known to be receptive to light-induced phase shifts—expression of both *c-fos* and *NGFI-A* increased (page 1237). The protein products of these two genes are among the intracellular messengers that probably alter DNA transcription, and these proteins may therefore be instrumental in shifting the phase of the organism's circadian rhythm.

■ RUTH LEVY GUYER



Chromatographers speak out about the Gilson Auto-Prep HPLC system

The Gilson Auto-Prep HPLC system has one pump for mobile phase delivery, another for repetitive sample injection. And that, according to a chromatographer in radiation oncology and cancer research, makes it surprisingly easy to recover trace amounts of protein from complex sample matrices. Repetitive injection of small volumes of sample allows the use of high-efficiency analytical or semi-prep columns for high throughput, excellent resolution, and very pure fractions.

"Overnight operation has really increased throughput"

A pharmaceutical QC lab supervisor likes the capacity and reliability of the system. A multimode fraction collector with 120- or 540-tube capacity is the key. The collector—either the Gilson 201 or 202—has a stationary rack design. Unlike collectors with carousel racks, it won't jam. The collector acts as a system controller, and multicycle capability allows collection of fractions from the repetitive runs into the same set of tubes for automated sample purification.

"Analytical and prep run results are reproducible"

After method development with an analytical system, many labs switch to preparative scale sample purification. Or switch back and forth to perform purity checks. With Gilson HPLC pumps, you simply replace the pump head to change the flow rate. Eight interchangeable pump heads offer flow rates as high as 200 ml/min.

"It's a compact system that saves bench space"

The Gilson Auto-Prep system is made up of modular components. The basic system stack, including the detector and pumping modules, has a footprint of about one square foot. And the 201 fraction collector offers 120-tube capacity in an equally compact space.

"Upgrading to gradient analysis was easy"

The modular design that makes our systems easy to fit on a crowded bench also makes it easy to upgrade the system. Going from isocratic to gradient with the Auto-Prep system simply requires the addition of pumping modules and, when necessary, a controller. All components from the original system are used, so none of your initial investment is lost.

To hear more, contact us today

We'll start by sending you a data sheet on this and other Gilson HPLC systems. Then, if you'd like, we'll put you in touch with some of the researchers we've been talking to. You can ask them yourself about the performance of the Gilson Auto-Prep HPLC system. Just mark the reader service number below. Or call us toll-free at 800-445-7661 (In Wisconsin call 608-836-1551).

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Science & Society

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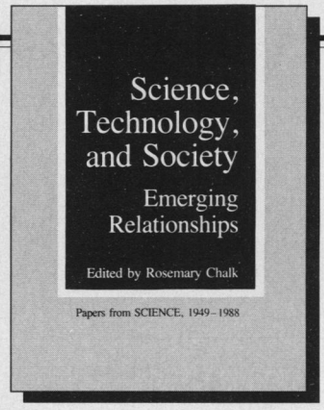

Science, Technology, and Society

Emerging Relationships

Edited by Rosemary Chalk

This volume provides a thorough introduction to the issues concerning the unique relationships among science, technology, and society (STS). It offers 85 articles, editorials, and letters published over the past 40 years in *Science*, the weekly journal of the AAAS.

The material provides a broad overview of the emerging relationships of science, technology, and society in the period after World War II. Contributors include Bertrand Russell, C.P. Snow, Pope John Paul II, and many scholars well known in the scientific literature. The collection reflects a variety of perspectives on science, technology, and society. Provocative essays capture the concerns of leaders in the scientific community who sought to articulate the pressing problems of their times.

The book is a valuable resource for those with a professional interest in STS studies. It is also designed for use as a supplemental text for college or high school courses examining the social context of STS. And it is of interest to lay readers who want to gain an insight into the purposes and values that shape the directions of science.

Topics include: Scientific responsibility; science and freedom; science and ethics; the human side of science; scientists and citizens; science and the modern world; fraud and misconduct in science; professional rights and duties in the health sciences; science and risk; and science and national security.

1989; 262 pp.; softcover; index
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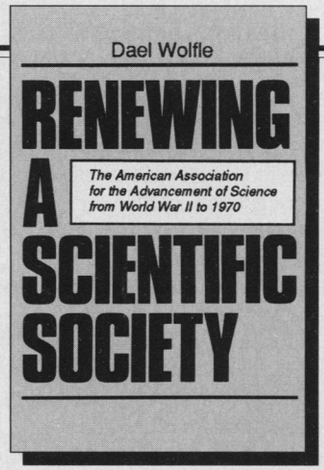

Renewing a Scientific Society

The American Association for the Advancement of Science from World War II to 1970

Dael Wolfle

Dael Wolfle was executive officer of AAAS during the post-war period that saw an unprecedented growth in American science. In this clear and engaging narrative, he describes the Association's role in that growth as well as its internal changes as it sought to serve its four key constituencies: scientists working in all fields of science and technology, students seeking careers in those fields, a public that increasingly needed to understand new technological advances, and opinion leaders whose decisions could influence scientific and technological activities.

Dr. Wolfle also describes the AAAS's work on a wide range of national issues, including development of the National Science Foundation; Cold War concerns about the loyalty and freedom of scientists; questions about the ownership and control of research; efforts to develop an effective science curriculum for all Americans; and issues regarding air conservation, the use of arid lands, the effects of herbicides in Vietnam, and much more.

This book is essential for historians of science, members of scholarly organizations, and everyone who wants to understand the inner workings of a major scientific society.

346 pp.; softcover; index
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