

The background of the cover is a photograph of a steamship. On the left, a tall, dark smokestack rises. In the center, another smokestack is emitting a plume of white smoke. To the right, a white ship's superstructure with a glass-enclosed upper level is visible. Several flags are flying: a red and white flag with a red lion on the right, a blue flag with a white emblem in the center, and a portion of the American flag on the left. The sky is blue with some clouds.

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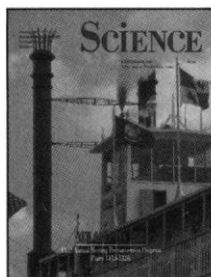
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COVER Riverboat, New Orleans, Louisiana. For details of the 1990 AAAS Annual Meeting, 15 to 20 February 1990, see pages 1313–1328. [Photograph by Michael Stuckey/Comstock]

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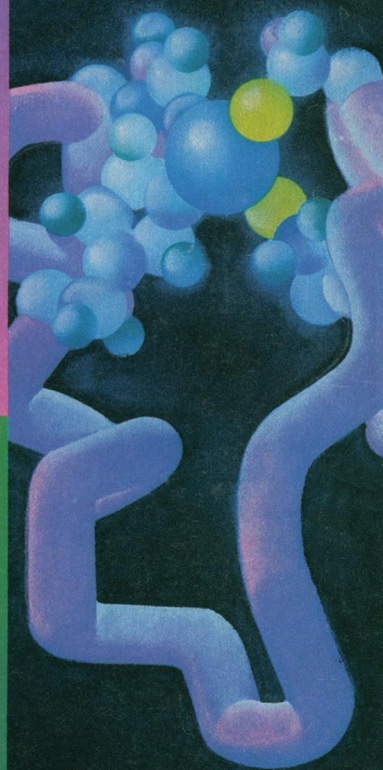
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This Week in SCIENCE

Maya-Spanish relations

WHEN Spanish conquerors took control of the Yucatan in the first half of the 16th century many Mayas fled the "colonial core" to escape Spanish hegemony. A likely picture of how Mayas at two remote communities—Tipu and Lamanai—accommodated to Spanish rule has been drawn by Graham *et al.* from a combination of archeologic evidence (representing the Maya experience) and documentary information (presenting the Spanish point of view) (page 1254). Early on, the Mayas appear to have cooperated well enough with the Spanish rulers—incorporating Spanish customs and goods into their culture, adopting Christianity, and participating in the trade networks of the Yucatan—to be left to administer their own communities. Later, in the 1560s, Tipu was reshaped into a Spanish-style town and became a base for the pacification of rebellious Mayas from the countryside; Lamanai retained its relatively independent character throughout the Spanish period. In 1638, a widespread Maya rebellion forced the Spaniards from Belize; Christian churches were burned, but certain Christian rituals were retained even after some pagan rituals were resumed. A successful meld of Maya and Spanish customs may have been key to the harmony that appears to have reigned at Tipu and Lamanai.

Generic antibody library

A technologic advance that may be as big as the development of monoclonal antibodies is on the immunologic horizon: libraries of genes encoding the two chains of Fab fragments—the parts of antibody molecules that bind to foreign substances—can be expressed in bacteria, and the product fragments can be screened for specific antibody activities (page 1275). The procedure actually obviates the need for immunizing animals (the sources of the antibody genes), because millions of clones, the complete "repertoire" of the animal, can be directly screened and desired antibodies amplified. Huse *et al.*

describe how the gene libraries were combined into a phage λ vector. With this system, more variants of antibodies can be generated than can be isolated from immunized animals. The technique will make available novel antibodies for diagnostic tests, laboratory reagents, and biosensors, and may revolutionize the production and study of catalytic antibodies, because it will no longer be necessary to identify and synthesize the often elusive transition-state analogs that are essential *in vivo* for eliciting such antibodies. Further discussion of this technique is found on page 1250.

Ocean motion

TIDES, winds, and waves engender near-surface ocean currents, but it has been difficult to accurately make complete area-wide images of surface motions. Now, however, Goldstein *et al.* show that these currents can be monitored with aircraft-borne radar equipment (page 1282); if the same equipment were satellite-borne, the monitoring of global near-surface currents might eventually become routine. A synthetic aperture radar with one transmitter and two receiving antennas was flown on a NASA DC-8 radar aircraft. Separate images were obtained with the two antennas, and an interferogram was generated from the phase differences between the paired images; the interferograms can be converted to maps of the surface currents. Because the radar images and interferograms capture details of a much wider area than can be sampled by freely drifting buoys (against which the radar results were compared), many important dynamic processes at and beneath the sea surface can now be measured.

Cationic cages

THREE-DIMENSIONAL chemical "cages" with large cation-lined cavities inside a porous framework have been prepared from molybdenum phosphates; the physical and chemical features of these materials

could make them of use for ion exchange reactions, molecular sieving to achieve chemical separations, and catalytic reactions. The compounds are similar to zeolites but have transition metals in their frameworks. The preparation, structure, and adsorption properties of the new microporous solids are described by Haushalter *et al.* (page 1289). The solid framework is a mixture of octahedrons and tetrahedrons with the chemical composition of $[(CH_3)_4N]_{1.3}(H_3O)_{0.7}[Mo_4O_8(PO_4)_2 \cdot 2H_2O]$. Twenty-five percent of the volume of the solids is "occupied" by the voids. How useful these microporous solids will prove to be will depend on the extent to which their pore sizes, compositions, charges, and dimensions can be manipulated.

Simian AIDS vaccine

RHESUS monkeys have been protected from infection and disease caused by the simian immunodeficiency virus, a monkey equivalent of the AIDS virus, with a vaccine that consisted of formalin-inactivated viruses and one or two adjuvants (which are standard "potentiators" of vaccines) (page 1293). In the studies of Murphey-Corb *et al.*, eight rhesus monkeys were fully protected from a challenge injection that causes infection in 100% of unprotected animals and kills 75% of them within 7 months. A ninth monkey was also clinically normal 1 year after the challenge, but blood cell tests indicated that infection with the virus had occurred. In a Perspective, Bolognesi discusses this and other approaches to vaccine preparation for AIDS and animal models of AIDS (page 1233). Because the targets of immunodeficiency disease viruses are cells of the immune system, immunizations are tricky: although recent results raise the possibility that protection can be achieved even if infection is not entirely prevented, it remains important to identify and to use for vaccines immunogenic, conserved viral components that induce protective immunity without enhancing infection.

■ RUTH LEVY GUYER

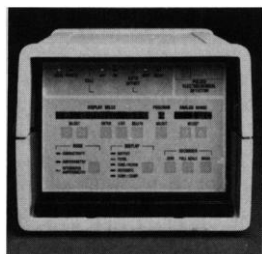
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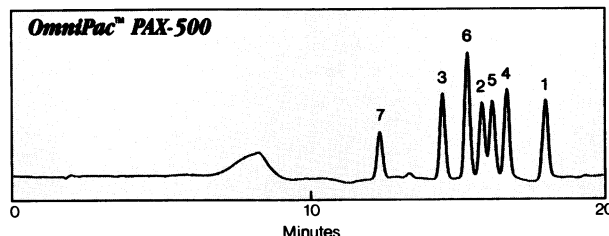
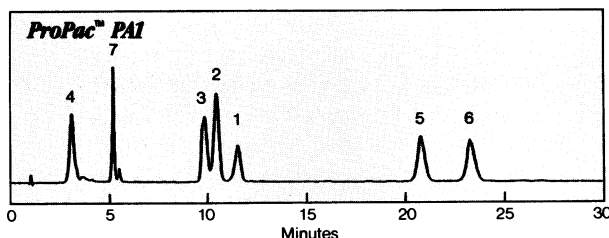
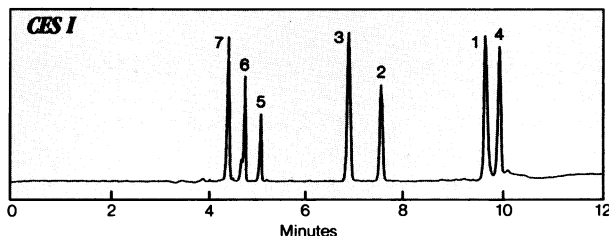
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Interview with a Disaster Expert

Science. Dr. Noitall, you have been referred to as the supreme savant of the second-guessers, the prince of the post-dictors, the man with perfect hindsight.

Dr. Noitall. A vast understatement of my true abilities.

Science. What is your opinion of the recent earthquake in California?

Dr. Noitall. As I had pointed out repeatedly, there should have been no two-level highways, no houses built on filled land, and no connecting sections in bridges. It is scandalous that authorities allowed such conditions to persist.

Science. But many two-decker highways, houses on landfill, and connecting bridges survived with minor or no damage.

Dr. Noitall. Of course. The second-guessers who are at the top of the profession are distinguished by their ability to ignore irrelevant data and focus on the data that support their theories. Otherwise one can get hopelessly confused and fail to blame the guilty parties.

Science. What do you conclude from hurricane Hugo?

Dr. Noitall. A case of criminal negligence. Placing a city in the path of a hurricane has got to be the monumental goof of city planners. I have surveyed the region and there was plenty of space 30 miles north or 30 miles south to locate the city of Charleston. There is no question in my mind that the mayor, the railroad companies, and state officials are all guilty of malfeasance.

Science. Dr. Noitall, what about the bombing of the Pan American airliner?

Dr. Noitall. The one thing that is clear is that the terrorists are not to blame. They are simple journeymen and women who are going about their profession in a meticulous and careful way. It is the airlines, the West German government, the British government, and airport security personnel who bear responsibility for failure to alert passengers to the threat.

Science. But there are many bomb threats. How could they have known that this one was serious?

Dr. Noitall. It's so simple. This one occurred! That distinguishes it easily from all the false alarms. The important responsibility of an enlightened second-guesser is to identify the individuals who can be sued. There is no value in blaming impoverished groups with no money in the bank, or acts of God.

Science. Do you consider massive fluctuations in the stock market a disaster?

Dr. Noitall. Absolutely! In November 1987 only one month after the stock market crashed, I stated that it had to happen. The multiples were too great, the deficit too extraordinary, and the trade balance too out of proportion to maintain high stock prices.

Science. With stocks high again, do you expect another crash?

Dr. Noitall. Quite clearly I'd love to comment on that. However, the ethics of the National Association of Second-Guessers is that we are not allowed to make predictions. I would be thrown out of the association for unprofessional conduct endangering the reputation of all second-guessers.

Science. You mean under no circumstances would you make any prediction?

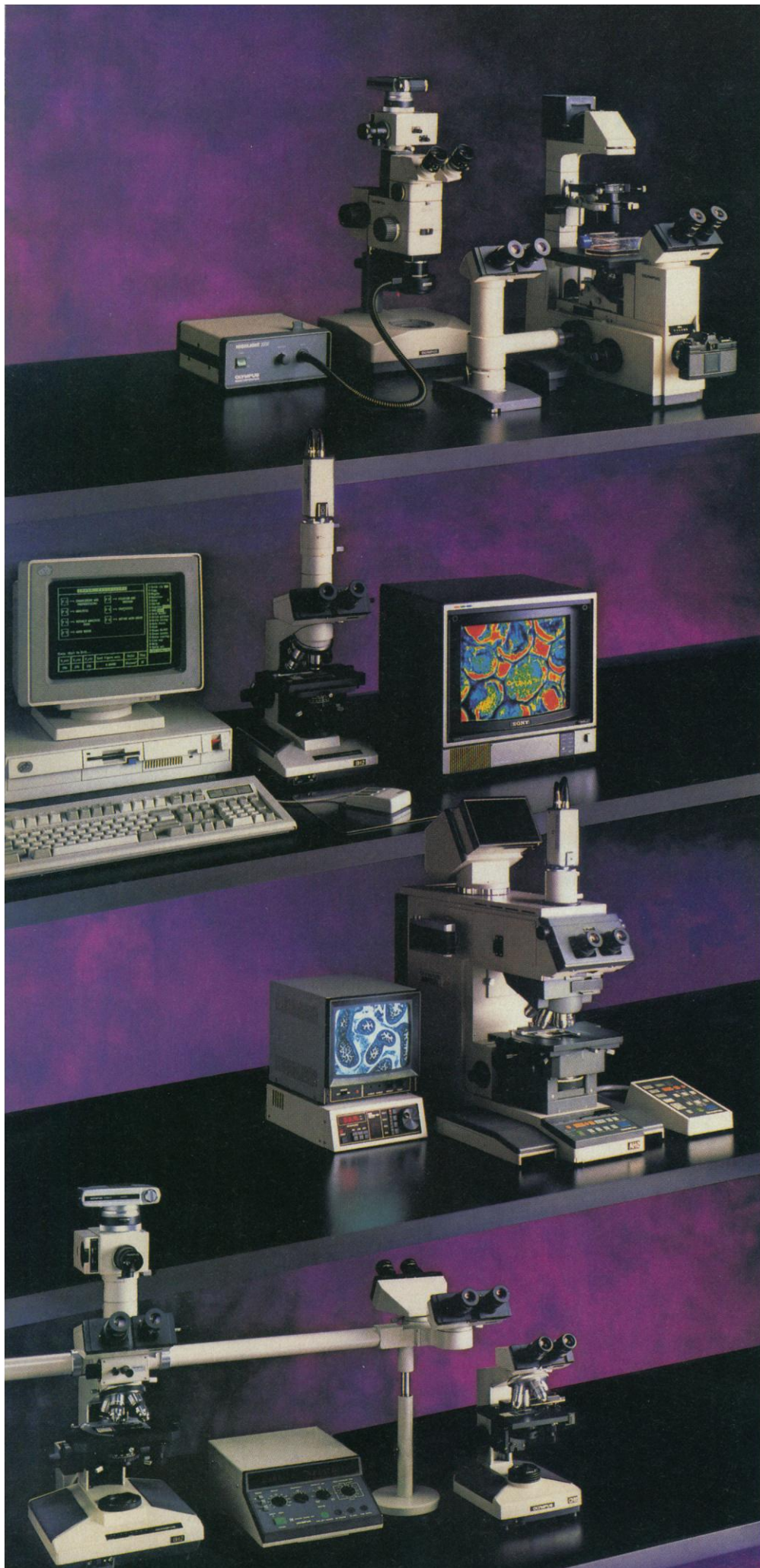
Dr. Noitall. If one predicts a 40% chance of rain, one can never be wrong. Our association is considering the possibility of allowing predictions when there is no chance of error. I can say with confidence there will be a 10% chance of an earthquake this year, a 15% chance of a hurricane, and a 12.5% chance of a stock market crash. Dr. Frank Lee Evasive, the man who invented this form of prediction, is about to be given our National Medal of Merit.

Science. Would you venture to make predictions in other circumstances?

Dr. Noitall. One device that we allow is what we call the self-canceling prediction. For example, this month I predicted unequivocally that the breaking of barriers in eastern Europe would force the Soviet Union to open its own borders and allow democracy in. Next week I am publishing a position paper that predicts that the wild changes in eastern Europe will force the Soviet Union to revert to repression in order to maintain its system. The documentation for each of these positions is superb, and in the future I will, of course, refer to whichever one turns out to be correct.

Science. Have you never made an unequivocal prediction?

Dr. Noitall. Only one. It is that the accuracy of second-guessers will only be exceeded by their numbers.—DANIEL E. KOSHLAND, JR.



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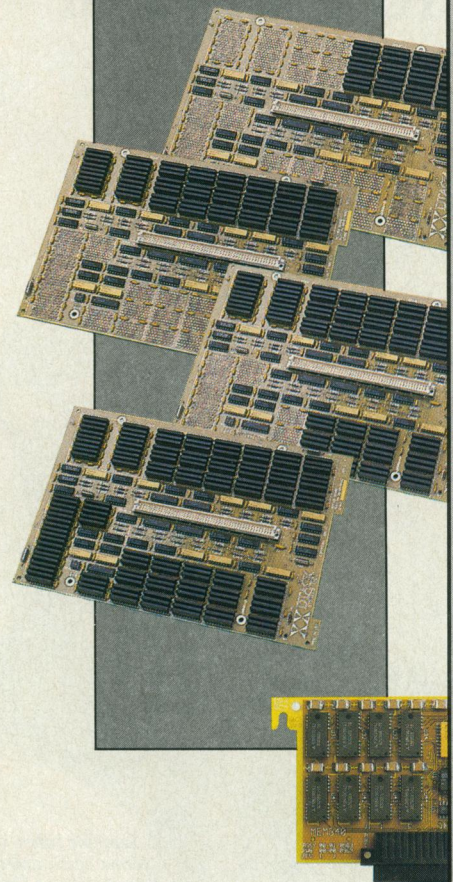
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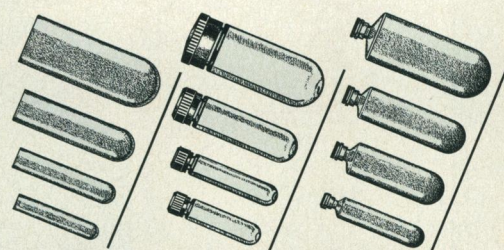
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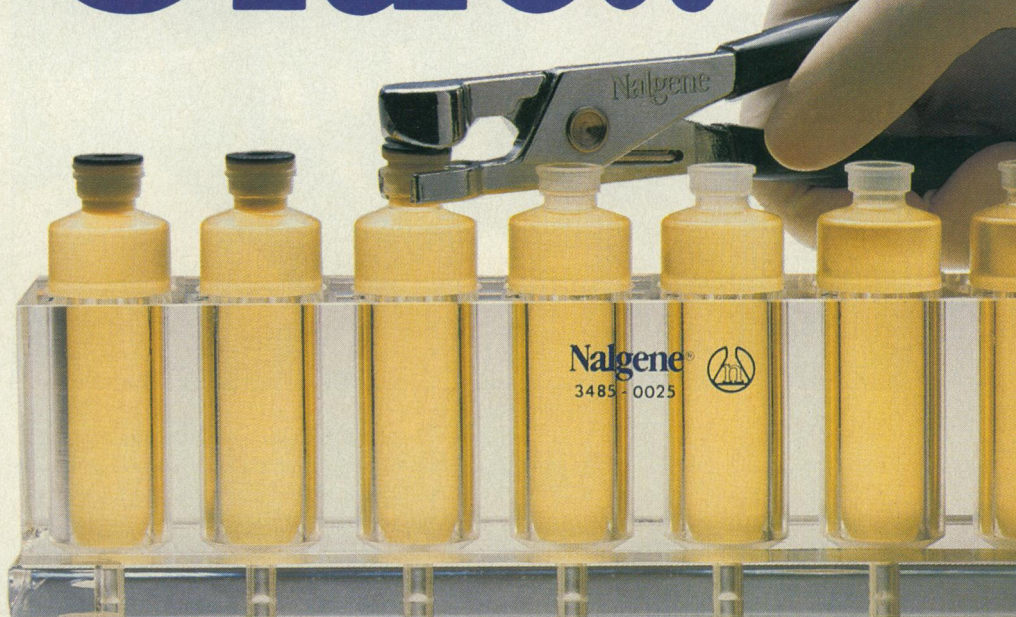
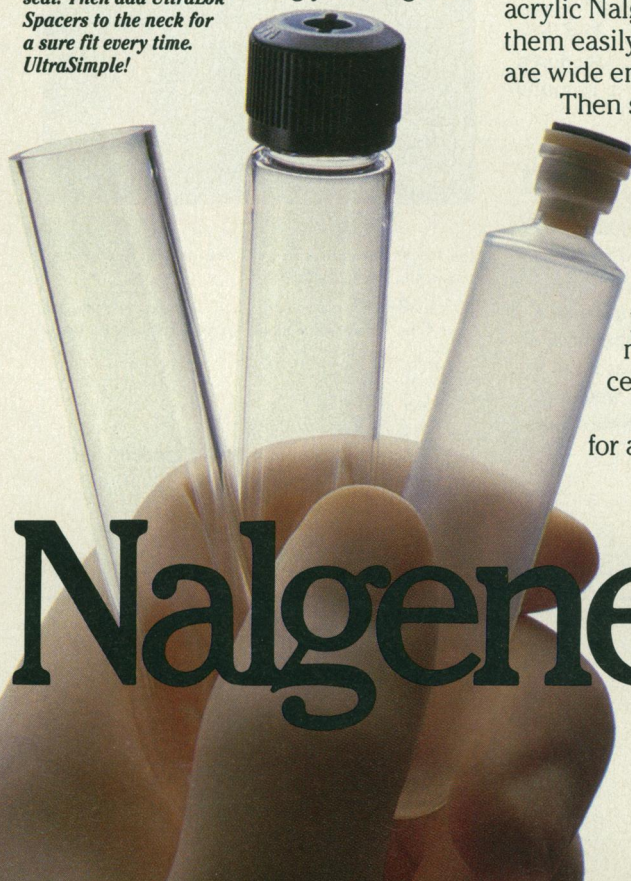
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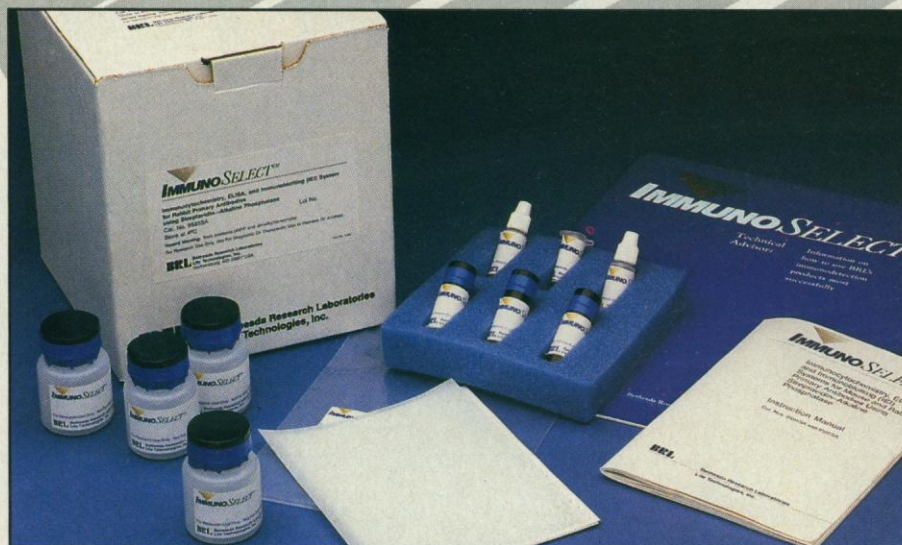
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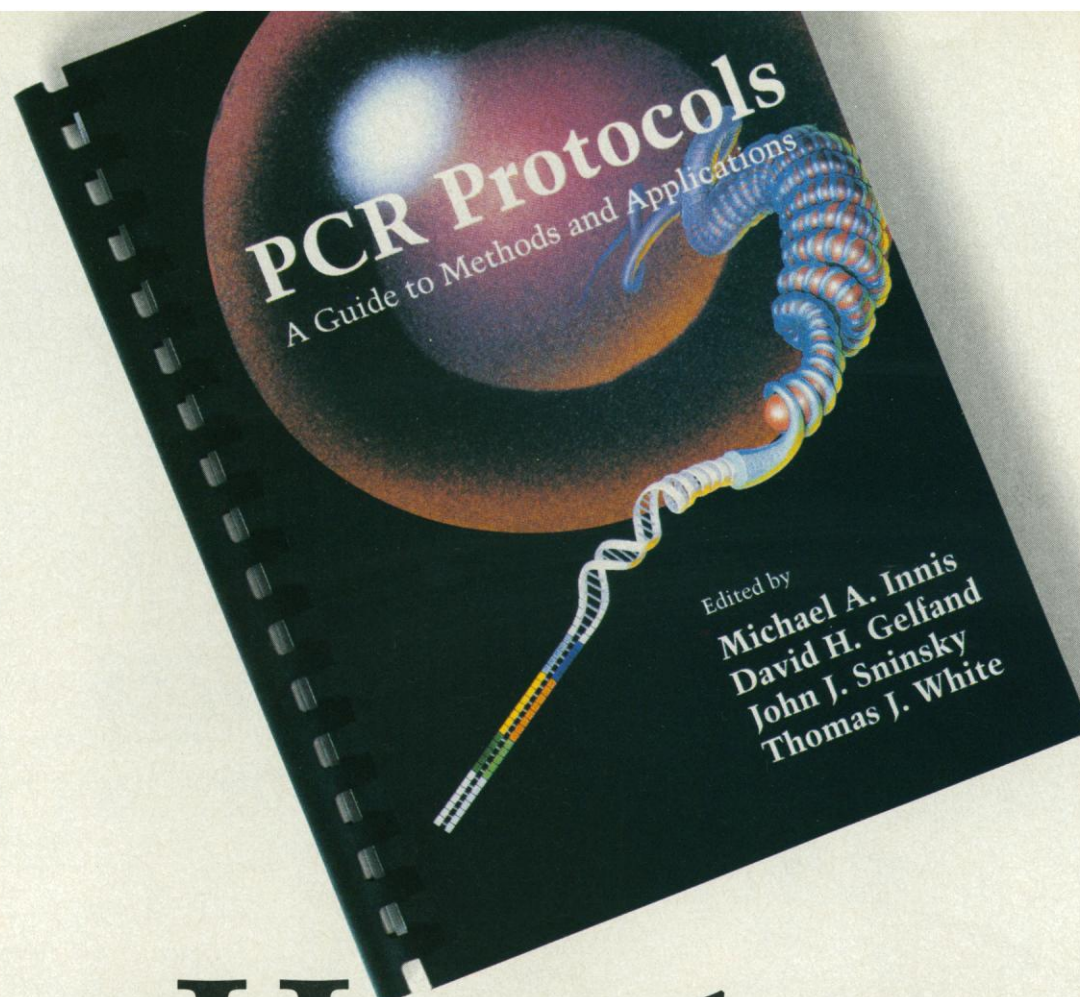
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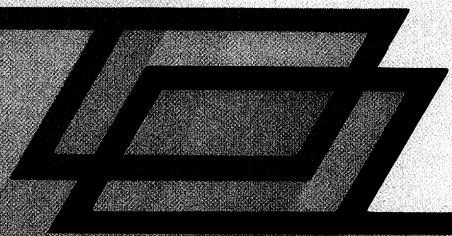
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The material provides a broad overview of the emerging relationships of science, technology, and society in the period after World War II. Contributors include Bertrand Russell, C.P. Snow, Pope John Paul II, and many scholars well known in the scientific literature. The collection reflects a variety of perspectives on science, tech-

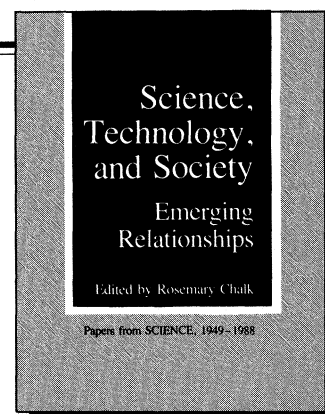
nology, and society. Provocative essays capture the concerns of leaders in the scientific community who sought to articulate the pressing problems of their times.

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 eth-

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Renewing a Scientific Society *The American Association for the Advancement of Science from World War II to 1970*

Dael Wolfle

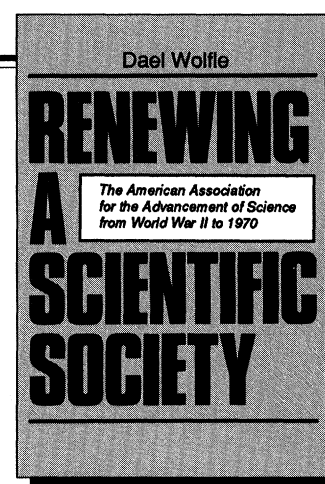
Dael Wolfle was executive officer of AAAS during the post-war period that saw an unprecedented growth in American science. In this clear and engaging narrative, he describes the Association's role in that growth as well as its internal changes as it sought to serve its four key constituencies: scientists 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.

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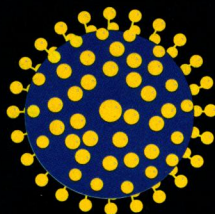
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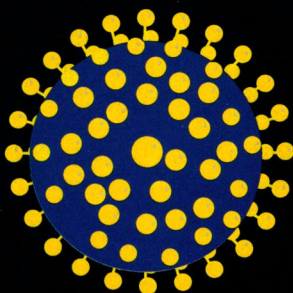


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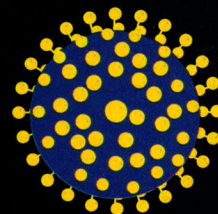


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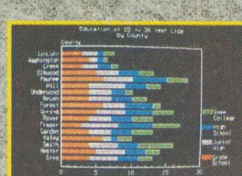
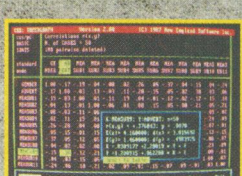
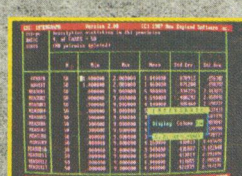
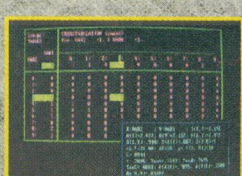
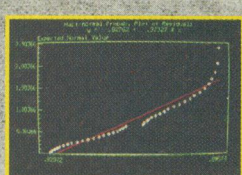
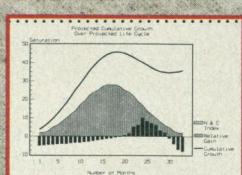
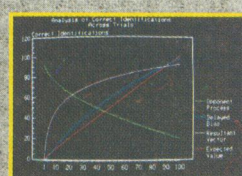
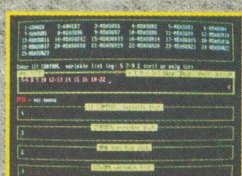
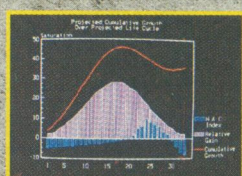
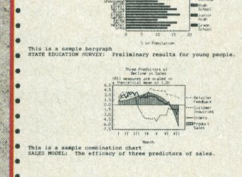
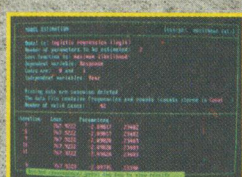
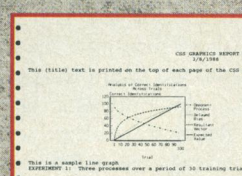
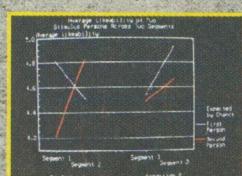
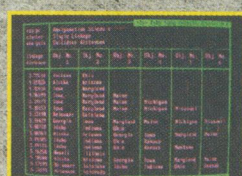
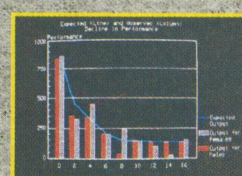
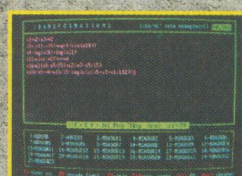
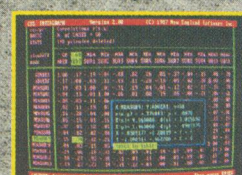
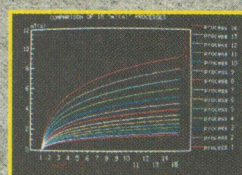
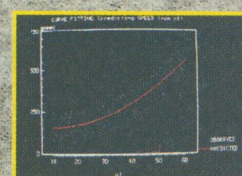
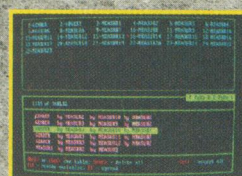
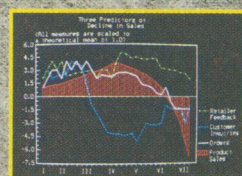
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Fax: (201) 329-9069

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East Sheen, London, England SW14 7AE
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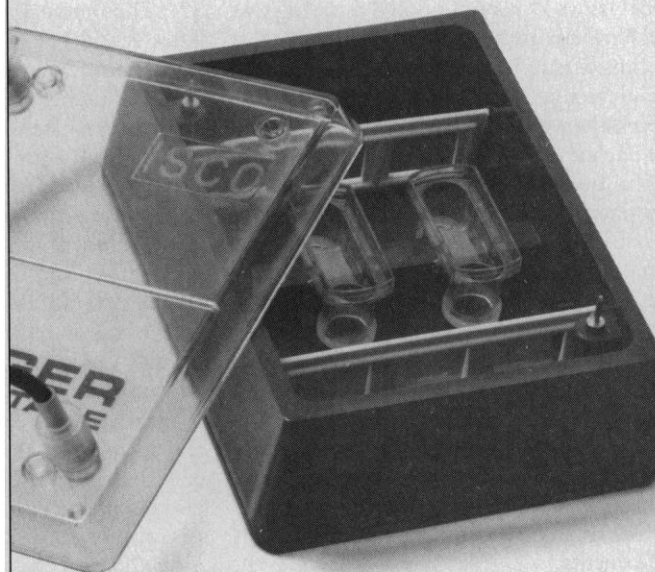
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347 Consortium Court
London, Ontario, Canada N6E 2S8
Phone: (519) 668-1256
Fax: (519) 668-8437

Contest will close May 1, 1990.
Winner to be announced shortly afterward.
The free offer applies to the United States and Canada; other countries will be charged for installation, duties, taxes, etc.
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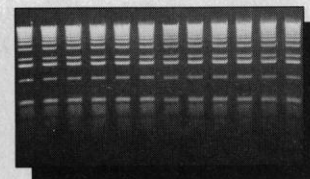
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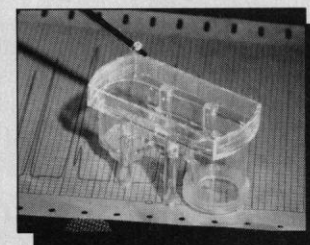
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their transportation policies. San Francisco and Portland were pioneers in the 1970s, and the most recent addition to a lengthening list is Philadelphia, which has adopted San Francisco's explicit "Transit First" policy. Various tax bills at the federal level are also oriented to "leveling the playing field" between transit and autos by extending exemptions to employer-provided subsidies. While this does not represent a comprehensive policy, it is a shift in the right direction.

Urban families are hurt economically by auto domination. The average family transportation expenditure in New York City is 16% of its annual budget; in Los Angeles, without as extensive a transit system, the transportation expenditure eats up 21%. Private employers are hurt as well, since they must provide auto parking subsidies to employees that are far greater than public transit subsidies. Governments also suffer, since many city services are thinly disguised auto services that compete with other governmental functions. Finally, everyone suffers from urban sprawl, suburban congestion, and widespread pollution.

What is most in need of reform is U.S. transportation subsidy policy. We cannot hope to have a good transit policy in isolation from the dominant automobile system

in which it is imbedded. The reform should be based on land-use policies that encourage travel by transit, elimination of disparity between auto and transit subsidies, and user charges for the external costs of pollution and congestion. With these in place, the transportation system will be far more rationalized; it will look more like those of other industrialized countries. The consequences will be a less costly system, less pollution and congestion, greater energy security for the nation, and a higher standard of living.

ALBERT H. PERDON
Southern California Rapid Transit District,
425 South Main Street,
Los Angeles, CA 90013

Kelp Production Study

Our recent report "Magnification of secondary production by kelp detritus in coastal marine ecosystems" (14 July, p. 170) omitted an important citation. A paper by K. H. Dunton and D. M. Schell (1) was cited twice in the manuscript we submitted, but was accidentally removed during our last revision. Their work on the fate of kelp production in Arctic foodwebs represents an

important contribution to our understanding of the role of kelp forests in nearshore ecosystems, and we apologize to them for this error of omission in our final draft.

DAVID O. DUGGINS
Friday Harbor Laboratories,
University of Washington,
Friday Harbor, WA 98250

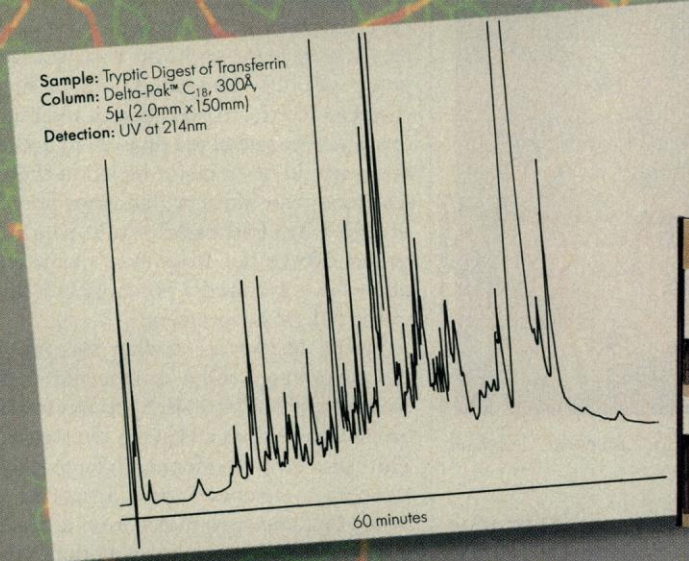
REFERENCES

1. K. H. Dunton and D. M. Schell, *Mar. Biol.* **93**, 615 (1987).


Erratum: In the report "The early radiation and relationships of the major arthropod groups" by D. E. G. Briggs and R. A. Fortey (13 Oct., p. 241), the third sentence of the abstract should have read, "Cladistic analysis of characters of Cambrian and living representatives (excluding Uniramia) shows that trilobites and chelicerates are relatively advanced compared with 'crustaceans,' and there are doubts whether the latter constitute a natural group."

Erratum: In paragraph 10 (p. 1324) of Jeremy Cherfas' article "Etienne-Emile Baulieu: In the eye of the storm" (News & Comment, 22 Sept., p. 1323), Gregory Pincus' primary affiliation should have been given as the Worcester Foundation for Experimental Biology.

Erratum: The caption for a series of head scans shown in the News & Comment article "AZT reverses AIDS dementia in children" (6 Oct., p. 21) was in error. The pictures of the brain, obtained by a CAT scan, indicate brain physiology but not metabolism. The latter would be revealed by a PET scan.



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Column: Delta-Pak™ C₁₈, 300Å,
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Detection: UV at 214nm




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Division of MILLIPORE

Advance Registration Form

1990 AAAS Annual Meeting ♦ New Orleans
15 - 20 February

Please print

Name of registrant _____
(last name first)

Institution/Company _____

Mailing address _____
(number / street)

(city / state / zip / country)

Daytime telephone number _____

Name of spouse registrant _____
(if attending meeting)

Convention address _____
(hotel or phone number)

Circle days you will attend Meeting: Thu Fri Sat Sun Mon Tue

☐ Check here if you need special services due to a handicap.

[1] **12 January deadline:** Advance registrations received after this date cannot be processed. On-site registration begins 15 February at the New Orleans Hilton. On-site rates: regular member, \$120; regular nonmember, \$160; all others, same as advance rates.

[2] **Refund requests** must be made in writing to the address below by **6 February** and will be honored after the meeting. **No refunds will be made for cancellations received after this date.**

[3] Fees for seminars, short courses, and spouse registration are **in addition to** (not in lieu of) the meeting registration fee.

[4] Nonmember 6-day (not 1-day) registration fee includes a 6-month membership with 25 issues of *Science*.

Advance Registration Deadline: 12 JANUARY 1990

Mail top portion (registration form) to:

AAAS Annual Meeting Registration
P.O. Box 23320
Alexandria, VA 22304-9330

OFFICE USE ONLY	
AMT PD	_____
CHECK #	_____
DEP. DATE	_____
SOURCE: S3	_____

I. Advance Registration Fees ¹

Category	Six-day	One-day	Amount
Regular member.....	[] \$95	[] \$45	\$ _____
Regular nonmember.....	[] \$135 ⁴	[] \$55	\$ _____
Student member.....	[] \$30	[] \$15	\$ _____
Student nonmember.....	[] \$50 ⁴	[] \$20	\$ _____
Postdoctoral member.....	[] \$35	[] \$15	\$ _____
Postdoctoral nonmember...	[] \$60 ⁴	[] \$20	\$ _____
HS teacher or Retired.....	[] \$45	[] \$20	\$ _____

One-day registrants circle one: Thu Fri Sat Sun Mon Tue

II. Additional Fees ³

	Six-day	One-day	
Spouse Registration	[] \$35	[] \$20	\$ _____

SEMINARS (3-day) & SHORT COURSES (1-day)

Category	Seminar	Short Course	
Regular.....	[] \$100	[] \$40	\$ _____
Grad. student or postdoc....	[] \$35	[] \$20	\$ _____

Seminar registrants check one only:

☐ Protein Folding ☐ Biology of Parasitism

Short course registrants check one only:

☐ Computer Simulation for Biomedical Scientists

☐ Chaotic Dynamic Systems

III. Payment ²

TOTAL AMOUNT: \$ _____

☐ check enclosed ☐ VISA ☐ MasterCard
☐ original institutional purchase order attached

Card No. _____ Expires _____

Signature _____

AAAS Hotel Reservation Form

AAAS Annual Meeting ♦ New Orleans ♦ 15-20 February 1990

Send confirmation to:

Name _____
(last name first)

Mailing address _____
(number / street)

(city / state / zip) (phone number)

Other occupants(s) of room _____
(names)

Indicate special needs due to a handicap: ☐ Wheelchair-accessible room

Other _____

Charge my major credit card. Card name _____

Card number _____ Expires _____

Signature _____

■ Reservations must be received at either hotel by 13 January 1990. Reservation requests received after this cut-off date are conditional on room availability.

■ All reservation forms must be accompanied by a desposit of one night's room rate plus tax; check or major credit card accepted.

■ If the room rate requested is no longer available, the next available higher rate will be confirmed.

■ Reservation changes and cancellations must be sent directly to the hotel.

■ Rollaway beds or additional adult in room: Hilton, \$22; Holiday Inn, \$15.

■ Children under age 18 stay free of charge in same room with parents if no extra bed is required.

Hotel Rates: Check boxes for your choice of hotel and room. Add 11% sales tax and \$2.00 occupancy tax to the rates shown. **Mail this hotel reservation form to the hotel of your choice (addresses below), together with a deposit equal to the room rate plus taxes for one night.**

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	single	double	suites
Main Bldg.	[] \$ 90	[] \$115	[] \$390 & up
Riverside	[] \$100	[] \$125	[] \$950 & up
Towers	[] \$115	[] \$145	[] \$575 & up

☐ Holiday Inn Crowne Plaza Reservations,

333 Poydras Street, New Orleans, LA 70130

	single	double	suites
	[] \$89	[] \$104	[] \$283 & up

Please list definite arrival and departure dates and times:

Arrival date _____ Time _____

Departure date _____ Time _____