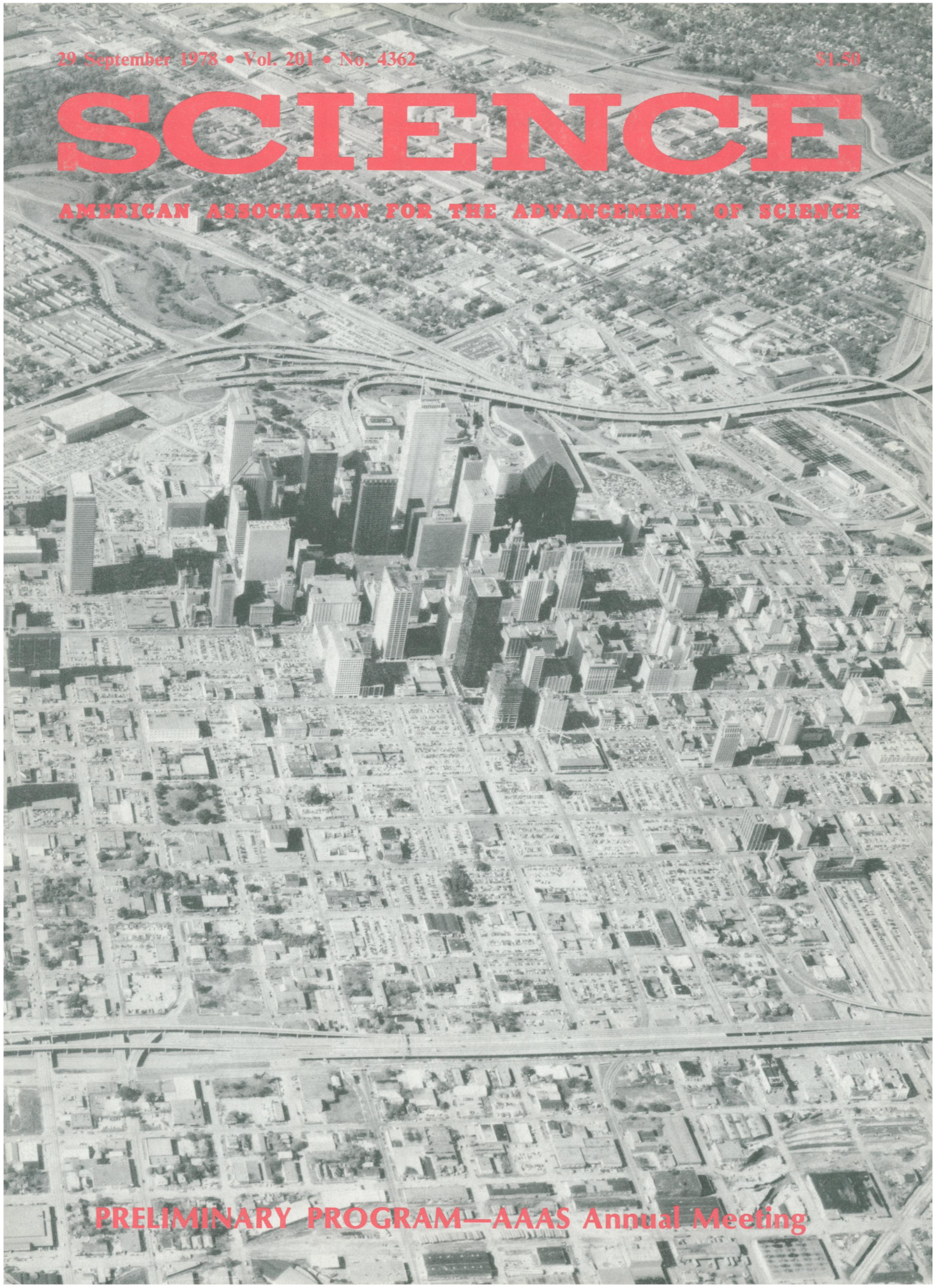
29 September 1978 • Vol. 201 • No. 4362 $1.50

SCIENCE

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



PRELIMINARY PROGRAM—AAAS Annual Meeting

AAAS BOOKS AAAS BOOKS

From heart disease to solar energy, from food to electronics—the American Association for the Advancement of Science publishes books which cover these topics and many more. Books that will keep you informed and abreast of important scientific advancements. Books that are designed for the researcher, scientist, engineer, student, and general public. Books that you need to read.

AAAS SCIENCE REPORT SERIES

Combating the #1 Killer: The SCIENCE Report on Heart Research, by Jean L. Marx and Gina Bari Kolata. Based on the American Heart Association's Blakeslee Award-winning articles in SCIENCE, this book presents an overview of the status of current research on all aspects of cardiovascular diseases. xi + 205 pp. $17.00 (case); $7.50 (paper).

Solar Energy in America, by William D. Metz and Allen L. Hammond. Chapters deal with research strategies of both government and industry: "Power Towers," photovoltaic cells and other collector strategies, fuel photosynthesis, wind and ocean thermal power, energy storage, and more. Fall 1978. ca. $17.00 (case); ca. $7.50 (paper).

Two other AAAS series, Compendia and R&D Reports, provide authoritative information on some of the principal issues that concern us all today. These publications can serve not only as valuable reference sources for scientists and researchers, but also as supplementary reading material in courses devoted to these issues.

AAAS SCIENCE COMPENDIA SERIES

ENERGY: Use, Conservation and Supply; Volume II. vi + 202 pp. $14.00 (case); $6.00 (paper).

ELECTRONICS: The Continuing Revolution. iv + 217 pp. $12.00 (case); $4.50 (paper).

MATERIALS: Renewable and Nonrenewable Resources. x + 198 pp. $12.00 (case); $4.50 (paper).

POPULATION: Dynamics, Ethics and Policy. viii + 184 pp. $12.00 (case); $4.50 (paper).

FOOD: Politics, Economics, Nutrition and Research. vi + 202 pp. $12.00 (case); $4.50 (paper).

ENERGY: Use, Conservation and Supply; Volume I. vi + 154 pp. $10.00 (case); $3.50 (paper).

HEALTH CARE: Regulation, Economics, Ethics, Practice. iv + 256 pp. Fall 1978. $14.00 (case); $6.00 (paper).

AAAS RESEARCH & DEVELOPMENT REPORT SERIES

Research & Development: AAAS Report III. xiv + 122 pp. $6.00 (paper).

Research & Development in the Federal Budget: FY 1978. xii + 148 pp. $5.00 (paper).

Research & Development in the Federal Budget: FY 1977. ix + 100 pp. $5.00 (paper).

Now . . . it's your turn to let us know how we can help you. . . .

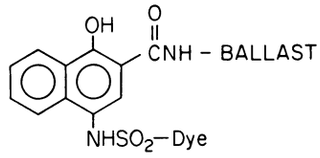
To order your individual copies of the above titles, please send your name, address, and list of book titles (indicate case or paper) to AAAS, Department J-1 , 1515 Massachusetts Avenue, NW, Washington, DC 20005. Remittance must accompany all orders under $10.00. Please allow 6-8 weeks for delivery.

Hammett's sigma values helped

Now that well over a million Kodak instant cameras are out working, word of the color performance of Kodak instant print film PR-10 is getting around. Organic chemistry students doing academic exercises based on the Hammett equation and wondering where it all leads may be heartened by the kind of talk that went on in the Kodak Research Laboratories when the three image dyes for this film were being designed.

Just like the teams who worked on each of the many other segments of the project, the folks who had to come up with the image dyes considered *theirs* the most crucial and toughest.

The concept called for a set of dye releasers—compounds to be oxidized by an electron transfer agent—no longer called a developer because it recycles—donating electrons to neutralize Ag^+ and regenerating itself by taking electrons from the dye releaser,



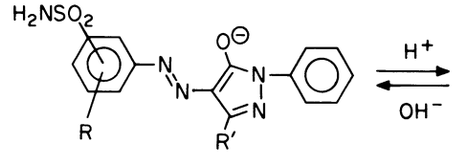
The oxidation in a highly alkaline environment releases the ionic entity $\bar{N}HSO_2$-Dye. This entity must survive unchanged through a pH range of 14 to 4, diffuse quickly through several gelatin-based layers, make its way past a gaggle of other chemical species that are there for various jobs, and attach itself firmly by ionic bonds and van der Waal's forces to a polymeric cationic mordant in the receiving layer. The negative charge that spreads over the combination as a whole of the sulfamoyl group and the π-electron cloud of the chromophore it has in tow is the key both to the mobility and to the final immobility.

A seminal paper by L. P. Hammett appeared in 1935 in *Chemical Reviews* 17:125. It did much to make the phenomena of organic chemistry quantitatively predictable, bringing order to masses of empirical data about the effect on reaction rates and equilibria of a given substituent in the meta- and para-positions on an aromatic nucleus. The relationship that pulls things together rather well is

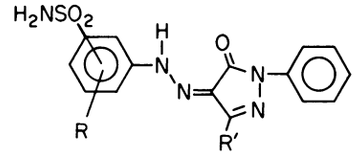
$$\log \frac{K}{K_0} = \rho\sigma$$

where, for specified reaction conditions, K is the equilibrium constant for an aromatic reactant, K_0 the constant for benzoic acid so substituted, ρ a constant that characterizes the reaction, and σ one that characterizes the behavior of that substituent in the meta- or para-position as the case may be. The σ-value then turns out to be interpretable as the tendency of the substituent to push electrons toward the reaction site or draw them away, according to whether σ is negative or positive respectively. That being the case, one might expect σ-values to help predict not only ease of ionization but also shifts in absorption maxima. Both, of course, were vital to our endeavor.

Cross-purposes between hue considerations and ionization ease came to a head in selecting R and R′ for our yellow dye:

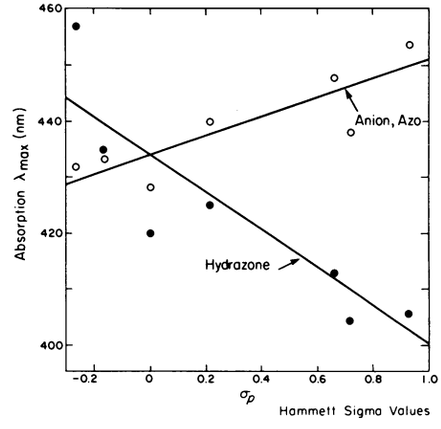


azo anion



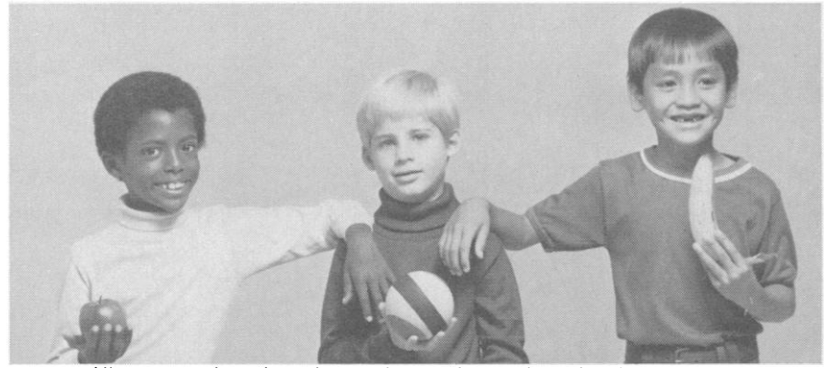
hydrazone

Plots like the following showed us that loss of the ionic state could shift hue badly:



As any organic major struggling with a Hammett question on an exam can plainly see, such plots also show that choosing the substituents for σ-values near the intersection of the two lines would avoid such troubles.

Kodak



Nice, but to show the colors we have to know where the electrons are.

ISSN 0036-8075

29 September 1978

Volume 201, No. 4362

SCIENCE

SCIENCE is published weekly, except the last week in December, but with an extra issue on the third Tuesday in September, by the American Association for the Advancement of Science, 1515 Massachusetts Ave., NW, Washington, D.C. 20005. Now combined with **The Scientific Monthly**®. Second-class postage paid at Washington, D.C., and additional entry. Member rates on request. Annual subscriptions $65; foreign postage: Canada $10; other surface $13; air-surface via Amsterdam $30. Single copies $1.50; $2 by mail (back issues $3) except **Guide to Scientific Instruments** $6. School year subscriptions: 9 months $50; 10 months $55. Provide 6 weeks' notice for change of address, giving new and old addresses and postal codes. Send a recent address label, including your 7-digit account number. **Postmaster: Send Form 3579 to *Science*, 1515 Massachusetts Avenue, NW, Washington, D.C. 20005.** ***Science*** is indexed in the *Reader's Guide to Periodical Literature* and in several specialized indexes.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

Aerial oblique photograph of Houston, Texas, November 1976. [Utility Data Corp., Houston] See page 1206, Preliminary Program of the AAAS Annual Meeting, 3–8 January 1979.

29 September 1978, Volume 201, Number 4362 SCIENCE

United States–Soviet Scientific Relationships

The issue of human rights has lent urgency to an assessment of scientific relationships between the United States and the Soviet Union. Such an examination was already in progress before the events of this year and the Kaysen report for the National Research Council was a major contribution. The study focused on a program of scientific exchanges sponsored by the National Academy of Sciences (NAS) together with the Soviet Academy of Sciences since 1959. The program had been created with four goals in view: (i) to establish individual and institutional contact with the scientific community of the Soviet Union, (ii) to learn about Soviet strengths and goals in science and engineering, (iii) to contribute to improved U.S.–Soviet relations, and (iv) to achieve at a later date the "normalization" of scientific contacts between the two countries. The panel noted that the NAS could claim "striking success" in meeting the first three goals.

In a world where thermonuclear war is an ever-present menace, progress toward the second and third goals is of great importance. Nevertheless, in our relationships with the scientists of the Soviet Union, we should not allow one-sided arrangements to persist.

For two decades, the Soviet Union has enjoyed a status of equality to the United States in international scientific matters. The reality is that in only a few fields does equality prevail. The Soviet Union can compete in almost any of a limited number of specific fields that the Kremlin chooses to emphasize. However, the planners are usually years behind the times and world science is conducted on a thousand frontiers. The Russians have never achieved an instrumentation industry and thus most of their scientists are poorly equipped. Another handicap is poor communication. The restricted interaction with the rest of the world has a counterpart in limited interchange within the Soviet Union. Finally, excessive weight is given to party loyalty and to the heads of laboratories, whose tenure is for life. In consequence, young scientists encounter many frustrations. With such handicaps the Russians will continue to lag behind in most fields.

Interactions with the Russians occur in a number of ways, such as the Pugwash conferences, Academy exchanges, and activities sponsored by the international scientific unions and by Unesco. The meetings of the unions have involved the most individuals and the greatest interchange of scientific information. Many warm friendships have begun at such gatherings.

The organization and conduct of a large international meeting is a huge task. Almost invariably the organizers find that by far their worst headaches come from the Russians. Many of them send in abstracts and announce their intention to participate. But when the time comes perhaps half will be permitted to attend, thus leaving gaping holes in the schedule of papers. In other instances a group of uninvited or unscheduled people will show up demanding space on the program. The paper of an invited distinguished scientist will often be read by a party hack. When the international meeting is held in Russia there are usually visa problems. The international scientific community should not tolerate such forms of behavior.

In the bilateral exchanges the record is better, and in some areas of science there is a clear gain for both parties. For example, cooperation in the earth sciences has been worthwhile. But too often in other areas the United States has given far more than it has obtained. Current opinion in Washington is that we should be more selective in our interactions. We should ask with respect to a particular field, How good are they? Where are the key installations? Will we have access to the top people and laboratories?

It is in our national interest to continue to have interactions with the scientists of the Soviet Union. But the time has come to conduct the relationship on a tough-minded basis. In the process, though, we should remember that some sanctions may injure well-meaning scientists far more than they irritate the Kremlin.—PHILIP H. ABELSON

SOLAR ENERGY IN AMERICA

William D. Metz and Allen L. Hammond

An authoritative book that documents where solar energy has been and where it is going.

Based on in-depth reporting for SCIENCE magazine, **Solar Energy in America** is a thorough assessment of our progress in tapping the ultimate energy source—the sun. While no single energy source may meet all future demands, solar energy seems to have the greatest potential. It is technically feasible, environmentally attractive, and rapidly becoming commercially sound. **Solar Energy in America** details the diverse technologies that depend upon the sun as their energy source, evaluates the potential and the problems of each, and alerts the reader to both the short-term and long-range prospects. The authors find that the field of solar energy is undergoing an unparalleled technical revival, and that there is no reason why many solar technologies cannot begin to be used at once. **Solar Energy in America**—the latest edition of the expanding SCIENCE Report series*—will be a useful publication for solar energy enthusiasts as well as skeptics, for college students as well as policy analysts. It is a AAAS book for everyone who wants a broad and thorough perspective on solar energy today.

Solar Energy In America; by William D. Metz and Allen L. Hammond. 1978, xvi + 218 pages, index.
Retail price: $18.50 (casebound), $8.50 (paperbound).

*The first title in the series is Combating the #1 Killer: The SCIENCE Report on Heart Research, by Jean L. Marx and Gina Bari Kolata. xi + 205 pages. $17.00 (casebound), $7.50 (paperbound). AAAS members deduct 10% from retail price.

To order your copy of **Solar Energy in America,** please send your name and address to AAAS, Department ES-1, 1515 Massachusetts Avenue, NW, Washington, DC 20005. Remittance must accompany all orders under $10.00. AAAS members deduct 10% from retail price. Please allow 6-8 weeks for delivery.

American Association for the Advancement of Science

Science and Technology: Resources for Our Future

The 1979 AAAS Annual Meeting (our 145th national meeting) will be held in Houston, Texas, during our new (and permanent) time slot, 3–8 January. It will celebrate three important centennials: the birth of Albert Einstein, the founding of the first laboratory for experimental psychology (by Wilhelm Wundt), and the invention of the electric light (by Thomas Edison)—events of seminal importance in the development of the physical sciences, of the behavioral sciences, and of technology.

We may derive much interest and instruction in these contemplations of our origins; however, we should bear in mind Henry Rowland's remark (in his AAAS vice-presidential address made just 4 years after these events), "American science is a thing of the future and not of the present and past . . . ," a remark which must now be extended (somewhat out of Rowland's context) to all of science and technology.

In a world still largely scourged by the four horsemen of antiquity and yet changing so rapidly as to require contemplation of the future as a cultural "shock," it behooves us to cherish the intellectual resources which permit us some measure of understanding and control of our natural conditions. Those who contemplate the past with a nostalgia for simpler times and who call for a slowing or stopping of scientific inquiry and technological development, should also say in what humane way they would reduce the world's population—and the aspirations of its citizens—to the levels of those simpler times. In truth, we have no choice but to continue to increase our understanding and to carefully apply this understanding toward bettering our lot; to this end nurturing and harvesting those resources which are science and technology.

The scope of these resources, their nurture and careful application, will once again be presented to AAAS members and to all concerned persons at our Houston Meeting. Some 140 symposia devoted to the physical, biomedical, and social sciences, will consider such issues as aging, nutrition, energy, development, communication, education, and a host of others. (The preliminary program is given in the following pages.)

In addition to the symposia, there will be a series of distinguished public lectures, a Science Film Festival, and an exhibit of the latest scientific instrumentation and publications. The Houston Advisory Committee, ably chaired by Norman Hackerman (President of Rice University) and Randall Meyer (President of Exxon Company, U.S.A.) has developed a wonderful set of tours and has promised Texas-size hospitality to all who attend.

We urge you to nurture your own resources. Come to the sun belt in early January, to the nation's energy capital and third largest port; make connections to a post-Meeting Mexican vacation or Rocky-Mountain ski vacation, but most importantly, come and stimulate your intellectual awareness during a very exciting week at your Annual Meeting in Houston.

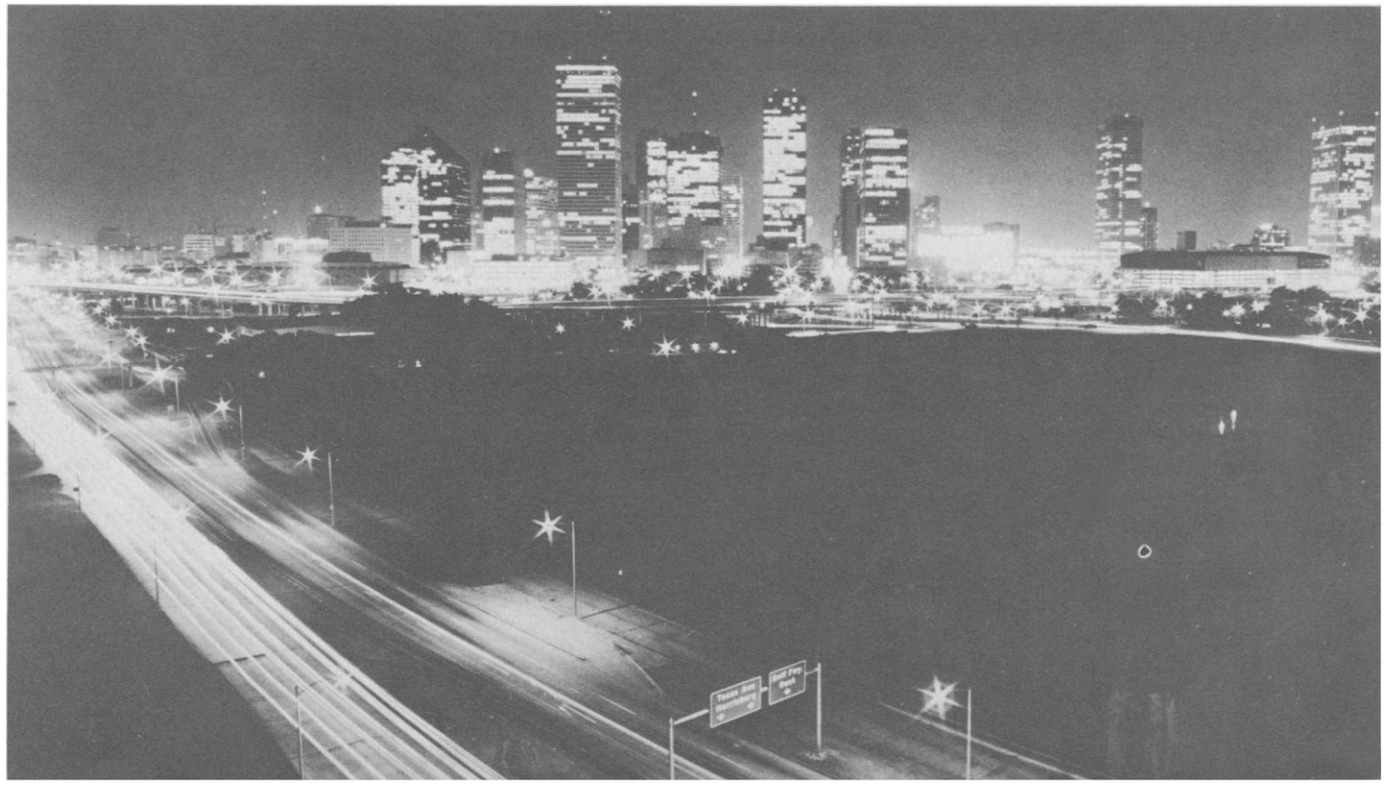
—ARTHUR HERSCHMAN

aaas

Annual Meeting
Houston
3–8 January 1979

For further details, and housing and information forms, see the following pages in this issue.

Downtown Houston skyline at night. [Houston Chamber of Commerce]



Annual Meeting
Houston
3–8 January 1979

Preliminary Program

Science and Technology: Resources for Our Future

Public Lectures

- **Co-Chairmen's Public Keynote Lecture (3 Jan., 1:45 p.m., SH).**
  Hannah Holburn Grey (President, University of Chicago).
  Topic to be announced

- **AAAS Public Presentation (3 Jan., 8:30 p.m., SH).**
  Light and Music Show

- **George Sarton Memorial Public Lecture (4 Jan., 1:45 p.m., SH).**
  George W. White (Professor of Geology, University of Illinois).
  Foundations of American Geology

- **AAAS Public Lecture (4 Jan., 8:30 p.m., SH).**
  Owen Garriott (Astronaut, Lyndon B. Johnson Space Center).
  Space Exploration and Reseach

- **Phi Beta Kappa Public Lecture (5 Jan., 1:45 p.m., SH).**
  Colin S. Pittendrigh (Bing Professor of Human Biology, Stanford University).
  Topic to be announced

- **AAAS Public Lecture (5 Jan., 8:30 p.m., SH).**
  Michael E. DeBakey (President, Baylor College of Medicine).
  Advances Toward a Better Understanding of Arteriosclerosis

- **AAAS Public Lecture (6 Jan., 1:45 p.m., SH).**
  Cyril Ponnamperuma (Professor of Chemistry, University of Maryland).
  Topic to be announced

- **AAAS Retiring President's Public Lecture (6 Jan., 8:30 p.m., SH).**
  Edward E. David, Jr. (President, American Association for the Advancement of Science; President, Exxon Research and Engineering Co., Inc.)
  Topic to be announced

- **AAAS Public Lecture (7 Jan., 1:45 p.m., SH).**
  Peter F. Drucker (Clarke Professor of Social Science, Claremont Graduate School).
  The Challenges of Antagonistic Interdependence

- **AAAS Public Lecture (7 Jan., 8:30 p.m., SH).**
  Hal Murray (Associate Professor of Biology, University of Southern Colorado).
  The Seasons of Man

1. General Interest

- **Getting Into Orbit: Historical Perspectives on the American Space Program (3 Jan., SH).**
  Arranged by Roger E. Bilstein (University of Houston at Clear Lake City).

- **How Big and Still Beautiful? Macroengineering Revisited (4 Jan., SH).**
  Arranged by Frank P. Davidson (Massachusetts Institute of Technology).

- **Industrial Maturation and the Shifting Spectrum of Scientific Innovation (5 Jan., SH).**
  Arranged by Norman Hackerman (Rice University) and Randall Meyer (Exxon Company, U.S.A.).

- **The Frontiers of the Social Sciences (5 Jan., SH).**
  Arranged by Meredith P. Crawford (George Washington University) and Priscilla Reining (American Association for the Advancement of Science).

- **Frontiers of the Natural Sciences (6 Jan., SH).**
  Arranged by Rolf M. Sinclair (National Science Foundation).

- **Science in Society: Are There Limits to Usable Knowledge? (7 Jan., SH).**
  Arranged by Gregg Edwards (National Science Foundation) and William A. Gale (Bell Telephone Laboratories, Murray Hill, N.J.).

HOTEL CODES: Shamrock Hilton . . . (SH); Houston Marriott . . . (HM)

2. Mathematical and Physical Science

- **Mathematics Today (3 Jan., SH).**
  Arranged by Felix E. Browder (University of Chicago).

- **Observing Opportunities for Orbiting Astronomers—Spacelab and Beyond (3 Jan., HM).**
  Arranged by Karl G. Henize (Lyndon B. Johnson Space Center).

- **Science for the Naked Eye: Or the Physics of Everyday Experience, VI (4 Jan., SH).**
  Arranged by Rolf M. Sinclair (National Science Foundation).

- **Frontiers of Industrial Physics (5 Jan., SH).**
  Arranged by D. Alan Bromley (Yale University).

- **Future Developments in Electrochemistry and Related Fields (5 Jan., SH).**
  Arranged by Rudolph A. Marcus (University of Illinois at Urbana).

- **Chemistry in Space (6 Jan., SH).**
  Arranged by Paul W. Hodge (University of Washington) and William D. Watson (University of Illinois at Urbana).

- **Satellite Oceanography: The SEASAT-I Mission (7 Jan., HM).**
  Arranged by Raynor L. Duncombe and Byron D. Tapley (University of Texas at Austin) and George H. Born (Jet Propulsion Laboratory).

- **Climatic Changes as a Potential Hazard Revealed by Geologic and Contemporary Records (7 Jan., HM).**
  Arranged by Robert F. Black (University of Connecticut at Storrs).

- **Weather, Climate, and Public Policy (8 Jan., HM).**
  Arranged by Roger Revelle (University of California at San Diego) and David Burns (American Association for the Advancement of Science).

3. Biological Science

- **Ligand Assays: The State of the Art (3 Jan., HM).**
  Arranged by Barry G. England and Daisy S. McCann (University of Michigan at Ann Arbor).

- **Various Approaches to the Study of Biologically Active Compounds (4 Jan., HM).**
  Arranged by Toby F. Block (University of Wisconsin at Stevens Point).

- **Nature and Functional Role of Cytochrome P-450 Mediated Systems (4 Jan., HM).**
  Arranged by Sami Ahmad (Rutgers University).

- **Effects of Prenatal Exposure to Alcohol: Human and Animal Studies (5 Jan., HM).**
  Arranged by Sharon Landesman-Dwyer (University of Washington).

- **Animal Models for the Study of Breast Cancer (5 Jan., HM).**
  Arranged by Seymour Holtzman (Brookhaven National Laboratory).

A monument to General Sam Houston stands in Hermann Park near the Museum of Natural Science. [Houston Chamber of Commerce]

- **Hemoglobin—A Model Protein (6 Jan., HM).**
  Arranged by Hiroshi Mizukami (Wayne State University).

- **Interactions Between Water and Cytoplasmic Structures (6 Jan., HM).**
  Arranged by Carlton F. Hazlewood (Baylor College of Medicine).

- **Handicapped Scientists: Some of Their Current Contributions to Biological and Medical Research (7 Jan., SH).**
  Arranged by Nansie S. Sharpless (Albert Einstein College of Medicine).

- **Clinical and Biochemical Aspects of Trace Metal Metabolism in Man (7 Jan., HM).**
  Arranged by Roland F. Bonewitz and R. Rodney Howell (University of Texas Health Science Center at Houston) and Rubye P. Torrey (Tennessee State University).

4. Medical Science

- **Internal Environment and the Immunologic State (3 Jan., HM).**
  Arranged by Barnet M. Levy (University of Texas Health Science Center at Houston).

- **Genetics in Epidemiology (4 Jan., HM).**
  Arranged by Bernice H. Cohen (School of Hygiene and Public Health, Johns Hopkins University) and Gordon Allen (National Institute of Mental Health).

- **Radiochemistry, Radiopharmaceuticals, Tomography, and New Aspects of Measuring Metabolism in Humans (5 Jan., HM).**
  Arranged by Alfred P. Wolf (Brookhaven National Laboratory).

- **Epidemiology Studies of Low-Level Radiation Exposure (6 Jan., HM).**
  Arranged by Rosemary A. Chalk (American Association for the Advancement of Science) and Robert Alvarez (Environmental Policy Institute, Washington, D.C.).

- **Biofeedback: Current Perspectives (6 Jan., HM).**
  Arranged by Theodore Weiss (University of Pennsylvania).

- **The Role of Genetics and Human Semen Cryobanking in Family Planning (6 Jan., SH).**
  Arranged by Mark S. Frankel (Wayne State University) and Mary S. Harris (Sickle Cell Foundation of Georgia, Inc., Atlanta).

- **Neuroscience and Disease: A Role for Serendipity (7 Jan., HM).**
  Arranged by Michael V. L. Bennett (Albert Einstein College of Medicine).

- **The Cancer Problem (8 Jan., SH).**
  Arranged by Louise T. Miller (Spelman College, Atlanta, Ga.), Judith R. Lumb (Atlanta University), and Yolanda S. George (Lawrence Livermore Laboratory).

5. Health Care

- **Technology and Health Care: Prospects and Pitfalls (3 Jan., HM).**
  Arranged by Stanley Joel Reiser (Harvard University Medical School).

- **Health Enhancement: Prevention and Promotion (4 Jan., HM).**
  Arranged by Ronald W. Manderscheid (National Institute of Mental Health).

- **Health Care Systems: Insights Through Large-Scale Simulation Modeling (4 Jan., HM).**
  Arranged by Kenan E. Sahin (Massachusetts Institute of Technology).

- **Health and the Environment: The Need for Greater Concern (5 Jan., HM).**
  Arranged by Samuel Elkin (School of Pharmacy, Temple University).

- **Politics, Science, and Cancer: The Laetrile Phenomenon (6 Jan., HM).**
  Arranged by Gerald E. Markle and James C. Peterson (Western Michigan University, Kalamazoo).

- **Medical Innovation and Public Policy: The Case of DES (6 Jan., HM).**
  Arranged by Diana B. Dutton, John P. Bunker, and Halsted Holman (Stanford University School of Medicine).

- **Hypnosis in the Control of Pain (7 Jan., HM).**
  Arranged by Marion Kenn and Paul Sacerdote (The Society for Clinical and Experimental Hypnosis, Inc.).

- **Psychosocial Aspects of Drug Treatment for Hyperactivity (7 Jan., HM).**
  Arranged by Kenneth D. Gadow (State University of New York at Stony Brook).

- **Self-Control Factors in the Use of Addictive Substances (8 Jan., HM).**
  Arranged by Peter K. Levison (National Academy of Sciences).

6. Agriculture and Nutrition

- **Research to Enhance Agricultural Productivity (3 Jan., HM).**
  Arranged by Peter R. Day (The Connecticut Agricultural Experiment Station, New Haven, Conn.).

- **Animals, Feed, Food, and People (4 Jan., HM).**
  Arranged by R. L. Baldwin (University of California at Davis).

- **Patterns and Effects of Diet and Disease Today (5 Jan., HM).**
  Arranged by John J. Hefferren (American Dental Association Health Foundation, Chicago, Ill.) and Mary L. Moller (Albert Einstein College of Medicine).

- **National Food Policy—Progress and Prospects (6 Jan., HM).**
  Arranged by Alex Hershaft (The MITRE Corporation, McLean, Va.).

- **Agricultural Systems for Space Habitats (6 Jan., HM).**
  Arranged by Jack M. Spurlock (Georgia Institute of Technology).

- **Environmental, Socioeconomic, and Political Aspects of Pest Management (7 Jan., HM).**
  Arranged by David Pimentel (Cornell University) and John H. Perkins (Western College of Miami University, Oxford, Ohio).

- **Plant Growth Regulators: Potential for Increasing Agricultural Productivity (8 Jan., HM).**
  Arranged by Larry D. Noodén (University of Michigan at Ann Arbor) and A. Carl Leopold (Cornell University).

7. Ecology and Environment

- **Technical and Environmental Implications in the Development of Marine Transportation Systems in the Arctic (3 Jan., SH).**
  Arranged by John E. Sater (Arctic Institute of North America, Arlington, Va.).

- **Deep-Sea Ecology (4 Jan., SH).**
  Arranged by Paul A. Haefner, Jr. (Rochester Institute of Technology).

- **The *Amoco Cadiz* Oil Spill (5 Jan., SH).**
  Arranged by Wilmot N. Hess (Environmental Research Laboratories, NOAA, Boulder, Colo.).

- **Air–Sea Interaction in the Gulf of Mexico (5 Jan., SH).**
  Arranged by Robert O. Reid and Guy A. Franceschini (Texas A & M University, College Station).

- **Gulf Coast Industry and Wildlife Management (6 Jan., SH).**
  Arranged by Donald J. Zinn (University of Rhode Island).

- **Mitigating Developmental Impacts on Fish and Wildlife (6 Jan., SH).**
  Arranged by Gerald C. Horak (Enviro Control, Inc., Fort Collins, Colo.).

- **Effects of Desertification on Soil: Chemical, Physical, and Biological Properties (7 Jan., SH).**
  Arranged by H. E. Dregne and B. L. Allen (Texas Tech University).

- **The National Forest Management Act Two Years Later: Scientific Issues Involved in Implementing NFMA (7 Jan., SH).**
  Arranged by Arthur W. Cooper (North Carolina State University at Raleigh).

- **Public Lands Belong to All the People (8 Jan., SH).**
  Arranged by Clair E. Terrill (Beltsville Agricultural Research Center, U.S. Department of Agriculture).

8. Mathematics in Biological and Social Sciences

- **The Uses and Misuses of Survey Data (3 Jan., HM).**
  Arranged by Barbara A. Bailar (Bureau of the Census, U.S. Department of Commerce).

- **Some Mathematical Questions in Biology (4 Jan., HM).**
  Arranged by Simon A. Levin (American Mathematical Society).

- **Artificial Intelligence in Medicine (5 Jan., HM).**
  Arranged by Peter Szolovits (Massachusetts Institute of Technology).

- **Application of Statistics to Problems of Air Pollution, Including Effects on Health (5 Jan., HM).**
  Arranged by Donald L. Thomsen, Jr. (SIAM Institute for Mathematics and Society, New Canaan, Conn.) and Paul Switzer (Stanford University).

- **Pattern Recognition: Introduction, Theory, and Application (5 Jan., HM).**
  Arranged by Robert S. Ledley (Georgetown University Medical Center).

- **Autopoiesis, Dissipative Structures, and Spontaneous Social Orders (6 Jan. HM).**
  Arranged by Milan Zeleny (Columbia University).

- **Frontiers of Behavioral Mathematics (7 Jan., HM).**
  Arranged by Loren Cobb (University of South Florida College of Medicine).

- **Hard and Soft Data in Multicriterion Benefit-Cost Modeling (7 Jan., HM).**
  Arranged by Robert M. Thrall (Rice University).

- **Advances in Distributed Processing: Implications for Neuroscience Paradigms (8 Jan., HM).**
  Arranged by Kenan E. Sahin (Massachusetts Institute of Technology).

9. Social and Behavioral Sciences

- **Glimpses Into Man's Past: The Development of Man (3 Jan., SH).**
  Arranged by Rolf M. Sinclair (National Science Foundation).

- **Hemispheric Dichotomy: Fact or Fantasy? (4 Jan., SH).**
  Arranged by Brenda Milner (Montreal Neurological Institute).

- **Immigrants: New and Old (4 Jan., SH).**
  Arranged by Charles Hirschman (Duke University).

- **What Kind of Social Science Is Scientific? (5 Jan., SH).**
  Arranged by Christie W. Kiefer (University of California at San Francisco).

- **Biology and Culture and Human Evolution (5 Jan., SH).**
  Arranged by Margaret S. Collins and Theodore A. Bremner (Howard University) and Irving W. Wainer (U.S. Food and Drug Administration).

- **Feminism and the Philosophy of Science (6 Jan., SH).**
  Arranged by S. Leigh Star (University of California at San Francisco) and Sandra Harding (University of Delaware).

- **Women and Scientific Research (6 Jan., SH).**
  Arranged by Michele L. Aldrich (American Association for the Advancement of Science), S. Leigh Star, and Sandra Harding.

- **Interdisciplinary Perspectives on Demographic Behavior (7 Jan., SH).**
  Arranged by Thomas K. Burch (University of Western Ontario).

- **Psychological Dimensions in the Acculturation Process: Theory, Models, and Some New Findings (8 Jan., HM).**
  Arranged by Amado M. Padilla (University of California at Los Angeles).

10. Personal and Family Development

- **The Making of Child and Family Policy: Does What We Know Affect What Is Done? (4 Jan., HM).**
  Arranged by Harold G. Wallach (Bureau of the Census, U.S. Department of Commerce) and Lyn Chambers (U.S. Senate Subcommittee on Child and Human Development).

- **Paradigms and Prejudices in Research on Homosexuality (5 Jan., HM).**
  Arranged by Noretta Koertge (Indiana University at Bloomington).

- **Demographic, Biographical, and Structural Perspectives on Human Life Course (5 Jan., HM).**
  Arranged by Kurt W. Back (Duke University).

- **Violence in the Family: Psychiatric, Sociologic, and Historical Perspectives (6 Jan., HM).**
  Arranged by Maurice R. Green (American Academy of Psychoanalysis, New York, N.Y.).

- **Frontiers of Aging (7 and 8 Jan., HM).**
  Arranged by Leah M. Lowenstein (Boston University Medical School), Vincent Cristofalo (Wistar Institute, Philadelphia, Pa.), Jay Roberts (The Medical College of Pennsylvania), Charles Parrish (Institute of Gerontology, Wayne State University), and Alvin Greenberg (School of Medicine, University of California at San Francisco).

- **The Outer Limits of Human Performance and Educability (8 Jan., SH).**
  Arranged by Jerry L. Fletcher (U.S. Department of Health, Education, and Welfare).

11. History and Philosophy of Science

- **The Usefulness of Marxist Dialectics in Science (3 Jan., SH).**
  Arranged by Lloyd Motz (Columbia University) and Lester Talkington (*Science and Nature* magazine, Tappan, N.Y.).

- **China's Science in World Perspective (4 Jan., SH).**
  Arranged by Leo A. Orleans and Patricia Jones Tsuchitani (National Academy of Sciences).

- **Science and Society—A Comparative History of Eugenics in Four Countries: U.S.S.R., Weimar Germany, United States, England (5 Jan., SH).**
  Arranged by Garland E. Allen (Washington University).

- **Thomas A. Edison: A Critical Examination on the Occasion of the Centennial of Electrical Lighting (5 Jan., SH).**
  Arranged by David A. Hounshell (Harvey Mudd College, Claremont, Calif.).

- **One Hundred Years of Scientific Psychology: 1879–1979 (6 Jan., SH).**
  Arranged by Gregory A. Kimble (Duke University) and Barbara C. Ross (University of Massachusetts, Harbor Campus).

- **The Einstein Centenary (7 Jan., SH).**
  Arranged by John J. Stachel (Institute for Advanced Study, Princeton, N.J.).

- **The Role of Consciousness in the Physical World (8 Jan., SH).**
  Arranged by Robert G. Jahn (School of Engineering and Applied Science, Princeton, N.J.).

12. Education

- **Issues in Science Education (3 Jan., SH).**
  Arranged by Marjorie Gardner (University of Maryland at College Park).

- **Minority Access and Representation in Higher Education: An Empirical Assessment (4 Jan., SH).**
  Arranged by Gail E. Thomas (Center for Social Organization of Schools, Johns Hopkins University).

- **How Academies of Science Can Communicate Science to the General Public (4 Jan., SH).**
  Arranged by Richard J. Raridon (Oak Ridge National Laboratory).

- **Prototypes of New Science Education (4, Jan., SH).**
  Arranged by Peter Signell (Michigan State University).

- **Programming Junior Academy of Science Activities (5 Jan., SH).**
  Arranged by Frank W. Starr (Waterloo Community Schools, Waterloo, Iowa).

- **The Public Understanding of Organized Science (6 Jan., SH).**
  Arranged by Keith M. Wulff (Concordia College, Moorhead, Minn.) and Jon D. Miller (Northern Illinois University, DeKalb).

- **The Anatomy of Controversy: Scientific Freedom and Responsibility for Teaching (6 Jan., SH).**
  Arranged by H. Bentley Glass (State University of New York at Stony Brook).

- **The Role of the Professions in Undergraduate General Education (7 Jan., SH).**
  Arranged by William J. Winslade (University of California at Los Angeles).

- **Programs in Science for Precollege Handicapped Students (7 Jan., SH).**
  Arranged by E. C. Keller, Jr. (West Virginia University) and Martha R. Redden (American Association for the Advancement of Science).

- **Model Programs: The Research Base and Implications for Performance-Based Teacher Education Program Development and Evaluation (7 Jan., SH).**
  Arranged by Donald W. McCurdy (University of Nebraska at Lincoln).

13. Information and Communication

- **Technology and Art—Present and Future (3 Jan., HM).**
  Arranged by Hugh H. Miller (National Academy of Engineering) and Reginald Pollak (Pennsylvania State University).

- **Recent Technological Advances in the Speech Sciences (4 Jan., HM).**
  Arranged by June E. Shoup (Speech Communications Research Laboratory, Santa Barbara, Calif.).

- **General Systems Research: Science? Methodology? Technology? (4 Jan., HM).**
  Arranged by B. R. Gaines (University of Essex, Colchester, England).

- **Individual and Social Electronics: Coping, Communicating, Understanding (5 Jan., HM).**
  Arranged by Joseph M. Dasbach (American Association for the Advancement of Science) and Joseph I. Lipson (National Science Foundation).

- **The Future of Electronic Communications (6 Jan., HM).**
  Arranged by Madeline M. Henderson (Institute for Computer Science and Technology, National Bureau of Standards), Starr Roxanne Hiltz (Upsala College), and Marcia J. MacNaughton (Office of Technology Assessment, U.S. Congress).

- **Information Transfer and Effective Utilization of Science and Technology (7 Jan., HM).**
  Arranged by Carole Ganz Brown (National Science Foundation).

- **Evolving Economics and Technology of Science Publishing (7 Jan., HM).**
  Arranged by Seldon W. Terrant and Michael Bowen (American Chemical Society, Washington, D.C.) and James Barsky (Academic Press, New York, N.Y.).

14. Energy

- **Underground Coal Gasification (3 Jan., SH).**
  Arranged by Esther M. Smith (Rocky Mountain Institute of Energy and Environment, University of Wyoming).

- **Long-Term Energy Transitions: Implications for Alternative Energy Strategies (4 Jan., SH).**
  Arranged by Michael D. Yokell and Lewis J. Perelman (Solar Energy Research Institute, Golden, Colo.) and August W. Giebelhaus (Georgia Institute of Technology).

- **The Nuclear Waste Management Controversy: Can Conflicting Values Be Reconciled? (5 Jan., SH).**
  Arranged by Dorothy S. Zinberg (John F. Kennedy School of Government, Harvard University).

- **Challenges in Assessing Oil and Gas Resources, and the Impact on National Planning (5 Jan., SH).**
  Arranged by John D. Haun (Colorado School of Mines, Golden) and David A. White (University of Oklahoma, Norman).

- **Commercializing Alternatives: Public–Private Sector Relationships on Energy R & D (6 Jan., SH).**
  Arranged by Irvin L. White (University of Oklahoma, Norman).

- **The Role of the Social Sciences in Energy Policy and Programs (6 Jan., SH).**
  Arranged by Kenneth M. Friedman (Office of Conservation Policy and Planning, U.S. Department of Energy) and Thomas N. Wilbanks (Oak Ridge National Laboratory).

- **Adapting Social Structures to an Energy-Short World (7 Jan., SH).**
  Arranged by Philip C. White (Technical Consultant, Washington, D.C.).

- **Energy and Society (7 Jan., SH).**
  Arranged by Charles J. Ryan (Terman Engineering Center, Stanford University).

15. Technology and Engineering

- **The Metric System: Costs versus Benefits (3 Jan., SH).**
  Arranged by David F. Bartlett (University of Colorado at Boulder).

- **The Measurement of Industrial Innovativeness (3 Jan., SH).**
  Arranged by Lawrence M. Kushner (National Bureau of Standards), Joseph P. Martino (University of Dayton, Ohio), and Albert H. Rubenstein (Northwestern University).

- **Manufacturing Technology: A Factor in the Productivity and the World Competitiveness of U.S. Industry (4 Jan., SH).**
  Arranged by Joel D. Goldhar (National Research Council) and Jack Baranson (Developing World Industry and Technology, Inc., Washington, D.C.).

- **Technological and Legal Aspects of Noise Control (5 Jan., SH).**
  Arranged by William A. Thomas (American Bar Foundation, Chicago, Ill.) and Richard A. Scribner (U.S. Department of State).

- **The Practice of Engineering versus the Pursuit of Science (5 Jan., SH).**
  Arranged by Thelma Estrin (Brain Research Institute, University of California at Los Angeles).

- **Large-Scale Transportation of Coal and Coal-Derived Energy: Alternatives and Impacts (5 Jan., SH).**
  Arranged by Martin D. Robbins (Colorado Energy Research Institute, Golden) and Aaron Gellman (Gellman Research Associates, Jenkintown, Pa.).

- **The Impact of Regulatory Environment on Innovative Decisions (6 Jan., HM).**
  Arranged by Manoucher Parvin (Columbia University).

- **Human Factors of Outer Space Production (6 Jan., SH).**
  Arranged by T. Stephen Cheston (Georgetown University) and David L. Winter (NASA, Washington, D.C.).

- **Community Science and Technology: Experience from the Communities (8 Jan., SH).**
  Arranged by Craig Decker (*Technology and Politics Newsletter*, Washington, D.C.) and Mary Ann Mackenzie (Community Services Administration, Washington, D.C.).

16. Technology and Development

- **Management of Energy-Related Growth in Rural Areas (3 Jan., SH).**
  Arranged by Don L. Boyer and Gary L. Watts (University of Wyoming).

- **The Impact of the Claims Settlement and Pipeline Construction on Alaska's Native People (4 Jan., SH).**
  Arranged by Sam Stanley (Center for the Study of Man, Smithsonian Institution) and June Helm (University of Iowa).

- **The Impact of Technological Change on Women in Development (5 Jan., SH).**
  Arranged by Roslyn Dauber (Office of Technology Assessment, U.S. Congress) and Melinda Cain (Denver Research Institute).

- **The Role of Elites in International Development (5 Jan., SH).**
  Arranged by James H. Stirling (Loma Linda University).

- **Opportunities for U.S.–Mexican Scientific and Technological Cooperation (6 Jan., SH).**
  Arranged by James Rowe (American Association for the Advancement of Science), Eduardo Feller (National Science Foundation), and Marcelo Alonso (Organization of American States).

- **Economic Aspects of Science and Technology Policy in Latin America (7 Jan., SH).**
  Arranged by Dilmus James (University of Texas at El Paso), Allen Jedlicka (University of Northern Iowa, Cedar Falls), and James Street (Rutgers University).

- **Development of Infrastructures for Science and Technology in Developing Countries: Indigenous and U.S. Goals and Responsibilities (7 Jan., SH).**
  Arranged by Charles V. Kidd (George Washington University) and Mary P. Williams (Office for Science and Technology, United Nations Organization).

- **Strategies in Graduate Education in Science and Technology (8 Jan., SH).**
  Arranged by William L. Wight (American Association for the Advancement of Science), R. S. Ganapathy (Urban and Regional Planning Program, University of Michigan at Ann Arbor), and Michael J. Moravscik (Institute for Theoretical Science, University of Oregon).

17. Science and Technology Policy

- **Scientific, Technological, and Institutional Aspects of Water Resource Policy (4 Jan., HM).**
  Arranged by Yacov Y. Haimes (Case Institute of Technology, Case Western Reserve University).

- **Science as Evidence in Judicial and Administrative Proceedings (4 Jan., HM).**
  Arranged by Arthur F. Konopka (National Science Foundation) and J. V. Martinez (U.S. Department of Energy, Germantown, Md.).

- **Scientific Freedom and Responsibility in the International Arena (5 Jan., SH).**
  Arranged by Joel Primack (University of California at Santa Cruz) and Jessica Tuchman Matthews (National Security Council, Washington, D.C.).

- **Zero-Base Planning of Federal R & D: Thought Experiments (5 Jan., HM).**
  Arranged by Rustum Roy (Pennsylvania State University) and J. D. deSolla Price (Yale University).

- **Building Toward a Hurricane Disaster (6 Jan., SH).**
  Arranged by Neil L. Frank (National Hurricane Center, NOAA, Coral Gables, Fla.).

- **Fencing in—and Fencing with—the Oceans (7 Jan., HM).**
  Arranged by David A. Katcher (U.S. Department of State) and William A. Nierenberg (Scripps Institute of Oceanography, University of California at San Diego).

- **Nuclear Nonproliferation Policy: Technology and Institutions (7 Jan., HM).**
  Arranged by David Hafmeister (California Polytechnic University, San Luis Obispo).

- **State and Local Science Policy Mechanisms: Are There Markets for Science in State and Local Government? (8 Jan., HM).**
  Arranged by Richard A. Scribner (U.S. Department of State), Phyllis Kahn (Minnesota House of Representatives, St. Paul), and John Reuss (National Conference of State Legislatures, Denver, Colo.).

Annual Meeting

Houston

3–8 January 1979

MAIL TO:

AAAS—DEPT. R
1515 Massachusetts Ave., NW
Washington, D.C. 20005

ADVANCE REGISTRATION FORM (A)

• *PLEASE READ CAREFULLY* •

- Preconvention Program, badge, and voucher for full Program and Abstracts will be mailed to registrants in early December.
- Full Program and Abstract Volume will be held at *Advance Registrants' Desks* (Shamrock Hilton and Marriott hotels).
- **Registrations received after 15 December will be held at the AAAS Information Booth.**

PART I: Registrant's name and mailing address for receipt of badge(s), preconvention program(s), and *Science* (for new applicants)

(FIRST NAME) (LAST)

(STREET ADDRESS OR P.O. BOX NUMBER)

(CITY) (STATE) (ZIP—U.S.A.)

(COUNTRY) (AREA CODE) (PHONE NUMBER)

(NAME OF INSTITUTION OR COMPANY)

PART III: Additional registrant(s) with same mailing address (use separate form if address differs)

(FIRST NAME) (LAST)

(FIRST NAME) (LAST)

PART II: Check ☑ categories of registration and enclose amount(s) indicated

Meeting Registration Categories	Single	Double (incl. Spouse)
AAAS Member	☐ $25	☐ $38
☐ Student or ☐ Retired Member *(Check one)*	☐ $13	☐ $20
Non-Member	☐ $31	☐ $44

Non-Members applying for membership with registration (check below): Dues of $31 (single) and $43 (double) includes one subscription to *Science* (52 issues per year). Rates are domestic-regular membership. Inquire for Canadian, other foreign, student, and retired persons.

☐ $56 Meeting registr. and single membership

☐ $69 Double registr. and single membership

Name of Member: _____

☐ $81 Dougle registr. and double membership

NOTE: Special one-day attendance registration will be available at Registration Desks.

CONVENTION ADDRESS: _____
(Where you can be reached) (Hotel, Street Address, and/or Phone No.)

Check days attending: Wed ☐ Thu ☐ Fri ☐ Sat ☐ Sun ☐ Mon ☐

☐ **Please check here if you need special services due to handicap. We will contact you prior to the meeting.**

SURVEY OF ATTENDANTS

Annual Meeting, Houston, 3–8 January 1979

Your answers to the following questions will help us in planning future AAAS Annual Meetings. Please complete the following form and either return it with your registration form or send in separately (to the same address) if you wish to respond anonymously (in any case, the two forms will be processed separately).

Principal Professional Interest
11 ☐ Physical, mathematical
12 ☐ Biological, medical
13 ☐ Engineering
14 ☐ Social, behavioral
15 ☐ Science policy
16 ☐ ..... (other)

Principal Professional Activity
21 ☐ Teaching, education
22 ☐ Health practice
23 ☐ Other practice, consulting
24 ☐ Research, development
25 ☐ Administration
26 ☐ ..... (other)

Institutional Affiliation Type
31 ☐ University, 4-year college
32 ☐ Other educational
33 ☐ Industrial, commercial
34 ☐ Other private
35 ☐ Government
36 ☐ ..... (other)

Highest Educational Level
41 ☐ Doctoral Degree
42 ☐ Master's Degree
43 ☐ Other professional
44 ☐ Bachelor's Degree
45 ☐ ..... (other)

Age
51 ☐ Under 26 years
52 ☐ 26 to 35 years
53 ☐ 36 to 45 years
54 ☐ 46 to 55 years
55 ☐ 56 to 65 years
56 ☐ Over 65 years

Number of Past AAAS Meetings Attended
61 ☐ None
62 ☐ One
63 ☐ Two
64 ☐ Three
65 ☐ Four
66 ☐ Five or more

Distance Traveled to Meeting
71 ☐ Under 51 miles
72 ☐ 52 to 150 miles
73 ☐ 151 to 400 miles
74 ☐ 401 to 1000 miles
75 ☐ 1001 to 3000 miles
76 ☐ Over 3000 miles

FOR HOUSING BUREAU USE ONLY

MAIL TO:
AAAS HOUSING BUREAU
1522 Main Street
Houston, Texas 77002

Annual Meeting
Houston
3–8 January 1979

OFFICIAL HOUSING REQUEST FORM

(Reservations received after 13 December cannot be guaranteed)
• *PLEASE READ CAREFULLY* •

- Please *PRINT* or *TYPE* all items to assure accuracy.
- Complete each part below in detail for correct and rapid computer processing.
- Should more than *ONE (1) room* be needed, supplemental room list *MUST* be attached using same format as in Part III.
- *ALL* confirmations will be sent to individual indicated in Part I.

PART I: Complete requested data using abbreviations as necessary.

NAME OF PERSON REQUESTING ROOMS:

(FIRST NAME) (LAST)

(NAME OF COMPANY OR INSTITUTION)

(STREET ADDRESS OR P.O. BOX NUMBER)

(CITY) (STATE) (ZIP - U.S.A.)

(COUNTRY) (AREA CODE) (PHONE NUMBER)

PART II: Select *THREE* hotels or motels of your choice, using *HOTEL CODES* listed below. No request will be processed without *THREE* choices.

First Choice ☐☐☐☐ (HOTEL CODE)

Second Choice ☐☐☐☐ (HOTEL CODE)

Third Choice ☐☐☐☐ (HOTEL CODE)

PART III: **1.** Select type of room desired. **2.** *Print* or *type* names of *all* persons occupying room (last names first). **3.** Enter arrival and departure dates and times.

Check one: **ROOM:** ☐ Single ☐ Double ☐ Twin **SUITE:** ☐ Parlor + 1 Bedroom ☐ Parlor + 2 Bedrooms

Please indicate any special housing needs due to a handicap: _____

Names of all Occupants of Room (Print last name first)

1. _____ 3. _____

2. _____ 4. _____

ARRIVAL DATE: _____ **TIME:** _____ ☐ a.m. ☐ p.m.

DEPARTURE DATE: _____ **TIME:** _____ ☐ a.m. ☐ p.m.

Note: Be sure to list definite arrival and departure date and time. Reservations will be held only until 6 p.m. unless special arrangements are made with hotel. The hotel may request a deposit.

Hotel Room Rates (Add 7% hotel tax)

Hotel	Hotel Code	Single	Double & Twin	Parlor + 1 Bedrm.	Parlor + 2 Bedrms.
Shamrock Hilton (*Headquarters*) [circle preferred rate]	**SH**	$32, $36, $40	$44, $48, $52	$80	$120
Houston Marriott	**MMH**	$30	$38	$100	$135
Astro Village Tower & Lodge	**ASVI**	$30	$36	$100	$135
Holiday Inn—Astro Village	**HIAV**	$28	$34	$75	$100
Tidelands Motor Inn	**TLM**	$26	$33	—	—
Tides II Motor Inn	**TLII**	$28	$35	$60	$100

IMPORTANT: No phone orders will be accepted. Hotel locations are shown on map. Housing Bureau processes reservations in order of date received. Confirmations will come direct from your hotel. DO NOT SEND DEPOSITS WITH RESERVATIONS. If rooms are not available at hotels of your choice, comparable reservations will be made at another cooperating hotel. If rate requested is not available, next available rate will be assigned. Cancellations must be made through the Housing Bureau only; other changes should be made directly with hotel.

For map of Houston and further information, see pages 1213 and 1216 in this issue.

Meeting Information

Listed below are the Houston hotels used by AAAS for program activities and housing during the Annual Meeting. The two-letter codes in parentheses identify session locations in the preliminary program.

Shamrock Hilton (SH), Main Street and Holcombe Blvd.: Housing (650 rooms blocked); symposia, public lectures; contributed papers (poster sessions only); business meetings; social functions; advance and on-site registration desks; welcome center (hospitality); resource center for disabled attendants; headquarters office; newsroom; employment information center; SCIENCE INTERNATIONAL (exhibits); *Science Film Festival*.

Houston Marriott at the Astrodome (HM), 2100 South Braeswood at Greenbriar: Housing (250 rooms blocked); symposia; business meetings; social functions; advance and on-site registration desks; information desk; AAAS office.

Hotels used for housing only: Astro Village Tower and Lodge (500 rooms) and Holiday Inn–Astro Village (300 rooms), both located at I-610 and Kirby Drive; Tidelands Motor Inn (125 rooms), 6500 South Main Street; and Tides II Motor Inn (150 rooms), 6700 South Main Street.

Special AAAS shuttle buses will operate between all participating hotels throughout the daytime and evening hours (see also "Ground Transportation").

For locations of and distances between these hotels, see map on page 1213 in this issue.

Registration

Meeting registration categories and fees are listed on the advance registration form on page 1214 in this issue. The fee includes the full program book and the abstract volume.

Advance registrants, please note: We will *not* mail the full program prior to the Meeting. Instead, we will send you in early December an expanded preconvention program, your badge, registration receipt, and a voucher redeemable on site for the program book, condensed program (foldout), and abstract volume. Present your voucher at one of the advance registrants' desks in the meeting registration areas.

Advance and on-site registration desks will be located at the Shamrock Hilton (Grand Ballroom Foyer) and at the Marriott (Convention Lobby). Registration hours at both locations are Wednesday, 3 January, through Sunday, 7 January, 8:00 a.m. to 6:00 p.m.

Registration Refunds

The AAAS will refund advance registration fees for all cancellations received in writing or by telegram prior to 27 December 1978. NO REFUNDS WILL BE MADE ON CANCELLATION NOTICES RECEIVED AFTER THIS DATE. Refunds will be mailed from the AAAS Offices in Washington, following the Annual Meeting.

Tax Deduction for Educational Expenses

Please note that U.S. Treasury Regulation §1.162-5 permits an income tax deduction for educational expenses (registration fees, and cost of travel, meals, and lodging) undertaken to (1) maintain or improve skills required in one's employment or other trade or business, or (2) meet express requirements of an employer or a law imposed as a condition to retention of employment, job status, or rate of compensation. This is true even for education which leads to a degree.

Housing

In cooperation with the AAAS, the six Houston hotels used for housing and meetings have set aside—at guaranteed reduced rates—blocks of guest rooms for the attendants of the Annual Meeting. The official housing request form on page 1215 of this issue lists the hotels and their rates. **These rates are guaranteed only when reservations are made through the AAAS Housing Bureau on the official reservation form prior to 13 December 1978.** Please read the important notice at the bottom of the housing form concerning reservation and room assignment procedures.

Do not be a "no-show." If you have made a hotel reservation and find that you cannot attend the meeting, write to the Housing Bureau (or call the hotel) and cancel.

On request, the hotels will accommodate additional persons in guestrooms (for example, three in a double room) at the following extra cost: Shamrock Hilton, $12; Marriott, $4; Astro Village and Holiday Inn, $5; Tidelands and Tides II, $4. Children are accommodated free of charge in same room with parents; age limits are as follows: Shamrock Hilton, no age limit; Marriott, 18; Astro Village and Holiday Inn, 12; Tidelands and Tides II, 13.

Ground Transportation

Buses from Houston Intercontinental Airport to and from the South Main Terminal (located adjacent to the Shamrock Hilton) depart every 1/2 hour during daytime and peak evening hours; the fare is $4.50. Taxis charge a flat rate of $17 plus 55 cents for each passenger sharing the vehicle.

All meeting hotels operate courtesy limousines to and from the South Main Terminal. If you need information about pick-up on arrival, use appropriate courtesy telephone to check with the hotel.

There is no special bus service between Hobby Airport and the South Main Terminal.

AAAS will be operating special shuttle buses between all meeting hotels throughout the daytime and evening hours during the Annual Meeting. Service will begin in the morning on Wednesday, 3 January, and conclude midday on Monday, 8 January.

Resources for Disabled Attendants

The AAAS, in cooperation with the Houston Advisory Committee, is again making every effort to make the Annual Meeting fully accessible to disabled individuals. In addition to hotel rooms which can accommodate wheelchairs, and accessible meeting areas, the following resources will be available:

- A Resource Center staffed with volunteers to offer assistance on request.
- Assistance in movement within and between meeting hotels as needed.
- Transportation service to and from airports and train and bus stations, as needed.
- Interpreters for the hearing impaired at all public lectures and for other sessions on request.
- Emergency repair service for wheelchairs.
- Round-the-clock telephone service responding to emergency needs.
- Special tour and sightseeing information for disabled persons.
- Audiotaped highlights of the meeting program for persons with visual impairments.

Persons needing special hotel accommodations, interpreting services, and other assistance are strongly urged to so indicate on the advance registration and housing request forms. Of the six participating hotels, only one is not wheelchair accessible: the Astro Village Tower and Lodge. Your early response will help us to plan and serve you better. For additional information or suggestions, *contact Martha Redden or Cheryl Davis, AAAS Project on the Handicapped in Science, 1776 Massachusetts Avenue, NW, Washington, D.C. 20036 (telephone: 202-467-4496).*

Employment Information Center

Adjacent to the exhibit area there will be bulletin boards for posting "positions wanted" and "positions open" notices. Also available will be small separated tables for conducting interviews. AAAS will not coordinate interactions between prospective employers and employees. **Hours**: 10 a.m.–6:00 p.m., 4–6 January; 10 a.m.–4p.m., 7 January.

Instructions for Contributors

The Editors of *Science*

Manuscripts submitted to *Science* for consideration for publication can be handled expeditiously if they are prepared in the form described in these instructions.

Submit an original and two duplicates of each manuscript. With the manuscript send a letter of transmittal giving (i) the name(s) of the author(s); (ii) the title of the paper and a one- or two-sentence statement of its main point; (iii) the name, address, and field of interest of four to six persons in North America but outside your institution who you think are qualified to act as referees for your paper; (iv) the names of colleagues who have reviewed your paper for you; (v) the field(s) of interest of readers who you anticipate will wish to read your paper.

Editorial Policies

All papers submitted are considered for publication. The author's membership or lack of membership in the AAAS is not a factor in selection. Papers are accepted with the understanding that they have not been published, submitted, or accepted for publication elsewhere. Authors will usually be notified of acceptance, rejection, or need for revision in 4 to 6 weeks (Reports) or 6 to 10 weeks (Articles).

Types of papers. Five types of signed papers are published: Articles, Reports, Letters, Technical Comments, and Book Reviews. Familiarize yourself with the general form of the type of paper you wish to submit by looking over a recent issue of the journal, and then follow the instructions for that type of paper.

Reviews. Almost all Articles, Reports, and Technical Comments, whether solicited or not, are sent to two or more outside referees for evaluation of their significance and soundness. Forms showing some of the criteria reviewers are expected to consider are available on request.

Editing. Papers are edited to improve the effectiveness of communication between the author and his readers. The most important goal is to eliminate ambiguities. In addition, improvement of sentence structure often permits readers to absorb salient ideas quickly. When editing is extensive, with consequent danger of altered meanings, papers are returned to the author for correction and approval before type is set. Authors are free to make additional changes at this stage.

Proofs. One set of galley proofs or an equivalent is provided for each paper. Keep alterations to a minimum, and mark them only on the galley, not on the manuscript. Extensive alterations may delay publication by 2 to 4 weeks.

Reprints. An order blank for reprints accompanies proofs.

Writing Papers

Organize your material carefully, putting the news of your finding or a statement of the problem first, supporting details and arguments second. Make sure that the significance of your work will be apparent to readers outside your field, even if you feel you are explaining too much to your colleagues. Present each step in terms of the purpose it serves in supporting your finding or solving the problem. Avoid chronological steps, for the purpose of the steps may not be clear to the reader until he finishes reading the paper.

Provide enough details of method and equipment so that another worker can repeat your work, but omit minute and comprehensive details which are generally known or which can be covered by citation of another paper. Use metric units of measure. If measurements were made in English units, give metric equivalents.

Avoid specialized laboratory jargon and abbreviations, but use technical terms as necessary, defining those likely to be known only in your field. Readers will skip a paper they do not understand. They should not be expected to consult a technical dictionary.

Choose the active voice more often than you choose the passive, for the passive voice usually requires more words and often obscures the agent of action. Use first person, not third; do not use first person plural when singular is appropriate. Use a good general style manual, not a specialty style manual. The University of Chicago style manual, the style manual of the American Institute of Physics, and the *Style Manual for Biological Journals*, among others, are appropriate.

Manuscripts

Prepare your manuscript in the form used by *Science*. Use bond paper for the first copy. Submit two duplicates. Double-space title, abstracts, text, signature, address, references (including the lines of a single reference), figure legends, and tables (including titles, column headings, body, and footnotes). Do not use single spacing anywhere. Put the name of the first author and the page number in the upper right-hand corner of every page.

Paging. Use a separate page for the title; number it page 1. Begin each major section—text, references and notes, and figure legends—on a new sheet. Put each table on a separate sheet. Place figure legends and tables after the references.

Title. Begin the title with a word useful in indexing and information retrieval (not "Effect" or "New").

References and Notes. Number all references to the literature, footnotes, and acknowledgments in a single sequence in the order in which they are cited in the text. Gather all acknowledgments into a single citation, and keep them short ("I thank," not "I wish to thank"). Cite all references and notes but do not cite them in titles or abstracts. Cite several under one number when feasible. Use *Bibliographic Guide for Editors & Authors* with the few suggested revisions in *International List of Periodical Title Word Abbreviations* for abbreviations of journal names. If the journal is not listed there, provide the full name. Use the following forms:

Journal: H. Smith, *Am. J. Physiol.* **98**, 279 (1931).
Book: F. Dachille and R. Roy, *Modern Very High Pressure Techniques* (Butterworth, London, 1961), pp. 163–180.
Chapter: F. Dachille and R. Roy, in *Reactivity of Solids*, J. H. de Boer, Ed. (Elsevier, Amsterdam, 1960), p. 502.

Illustrations. Submit three copies of each diagram, graph, map, or photograph. Cite all illustrations in the text and provide a brief legend, to be set in type, for each. Do not combine line drawings and photographs in one illustration. Do not incorporate the legend in the figure itself. Use India ink and heavy white paper or blue-lined coordinate paper for line drawings and graphs. Use heavier lines for curves than you use for axes. Place labels parallel to the axes, using initial capital and lowercase letters; put units of measurement in parentheses after the label—for example, Length (m). Plan your figures for the

smallest possible printed size consistent with clarity.

Photographs should have a glossy finish, with sharp contrast between black and white areas. Indicate magnification with a scale line on the photograph.

Tables. Type each table on a separate sheet, number it with an Arabic numeral, give it a title, and cite it in the text. Double space throughout. Give each column a heading. Indicate units of measure in parentheses in the heading for each column. Do not change the unit of measure within a column. Do not use vertical rules. Do not use horizontal rules other than those in the heading and at the bottom. A column containing data readily calculated from data given in other columns can usually be omitted; if such a column provides essential data, the columns containing the other data can usually be omitted.

Plan your table for small size. A one-column table may be up to 42 characters wide. Count characters by counting the widest entry in each table column (whether in the body or the heading) and allow three characters for spaces between table columns. A two-column table may be 90 characters wide.

Equations and formulas. Use quadruple spacing around all equations and formulas that are to be set off from the text. Most should be set off. Start them at the left margin. Use the solidus for simple fractions, adding the necessary parentheses. But if braces and brackets are required, use built-up fractions. Identify handwritten symbols in the margin, and give the meaning of all symbols and variables in the text immediately after the equation.

Articles

Articles, both solicited and unsolicited, may range in length from 2000 to 5000 words (up to 20 manuscript pages). Write them clearly in reasonably nontechnical language. Provide a title of one or two lines of up to 26 characters per line and a subtitle consisting of a complete sentence in two lines with a character count between 95 and 105 for the sentence (spaces between words count as one character each). Do not break words at the ends of lines. Write a brief author note, giving your position and address. Do not include acknowledgments. Place title, subtitle, and author note on page 1. Begin the text on page 2.

Insert subheads at appropriate places in the text to mark your main ideas. The set of subheads should show that your ideas are presented in a logical order. Keep subheads short—up to 35 characters and spaces.

Provide a summary at the end.

Do not submit more than one illustration (table or figure) for each four manuscript pages unless you have planned carefully for grouping. With such planning many illustrations can be accommodated in the article. Consult the editorial office for help in planning.

Reports

Short reports of new research results may vary in length from one to seven double-spaced manuscript pages of text, including the bibliography. Short papers receive preferred treatment. Limit illustrative material (both tables and figures) to two items, occupying a total area of no more than half of a published page (30 square inches). A research report should have news value for the scientific community or be of unusual interest to the specialist or of broad interest because of its interdisciplinary nature. It should contain solid research results or reliable theoretical calculations. Speculation should be limited and is permissible only when accompanied by solid work.

Title. Begin the title with an important word (preferably a noun) that identifies your subject. The title may be a conventional one (composed primarily of nouns and adjectives), a sentence (containing a verb), or a structure with a colon (Jupiter: Its Captured Satellites). Limit it to two lines of complete words of no more than 55 characters per line (spaces between words count as one character each). Do not use abbreviations. Type the title in the middle of page 1.

Abstract. Provide an abstract of 45 to 55 words on page 2. The abstract should amplify the title but should not repeat it or phrases in it. Qualifying words for terms used in the title may be used. Tell the results of the work, but not in terms such as "____ was found," "is described," or "is presented."

Text. Begin the text on page 3. Put the news first. Do not refer to unpublished work or discuss your plans for further work. If your paper is a short report of work covered in a longer paper to be published in a specialty journal, you may refer to this paper if it has been accepted. Name the journal. If the manuscript has not been accepted, refer to it as "in preparation." Omit references to private communications. Do not use subheads.

Signature. List the authors on the last page of the text and give a simple mailing address.

Received dates. Each report will be dated the day an acceptable version is received in the editorial office.

Letters

The Letters section provides a forum for discussion of matters of general interest to scientists. Letters are judged only on clarity of expression and interest. Keep them short and to the point; the preferred length is 250 words. The editors frequently shorten letters.

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Letters concerning technical papers in *Science* are published as Technical Comments at the end of the Reports section. They may add information or point out deficiencies. Reviews are obtained before acceptance.

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The selection of books to be reviewed is made by the editors with the help of advisers in the various specialties; arrangements are then made with reviewers. A sheet of instructions accompanies each book when it is sent to the reviewer.

Cover Photographs

Particularly good photographs that are suitable for use on the cover are desired.