Specialists are indispensable, but specialists who do not know how to talk to others outside their field are dangerous—McGeorge Bundy (The Godkin Lectures on the Essentials of Free Government and the Duties of the Citizen, 1968)

AAAS ANNUAL MEETING, DALLAS, TEXAS

26-31 December 1968

General Chairman: Hon. J. Erik Jonsson (Mayor of Dallas)

AAAS INVITED LECTURES AND PANELS Special Lecture I (26 Dec.). "The Odyssean Voyage in Science and Literature," Loren C. Eiseley (Department of Anthropology, University Museum, University of Pennsylvania). Special Lecture II (26 Dec.). "The Genetic Code," Marshall W. Nirenberg (Nobel Laureate, 1968; National Institutes of Health).	 □ Frontiers of Science Lecture II (29 Dec.). "Neurosciences: Man's Most Valuable Frontier," Robert B. Livingston (Department of Neurosciences, School of Medicine, University of California, San Diego). □ Sigma Xi-Phi Beta Kappa Lecture (29 Dec.). "Behavior Patterns of Scientists," Robert K. Merton (Professor of Sociology, Columbia University). □ Panel Discussion on Science, Technology, and Latin
Frontiers of Science Lecture I (27 Dec.). "Computer Technology and the Science of Curriculum," Patrick Suppes (Institute for Mathematical Studies in the Social Sciences, Stanford University).	American Development (30–31 Dec.). Arranged by Harrison Brown (Professor of Geochemistry and Professor of Science and Government, California Institute of Technology).
Distinguished Lecture (27 Dec.). "Science and Social Purpose; First Principles for a National Science Policy," James A. Shannon (Special Adviser to the President, National Academy of Sciences).	Frontiers of Science Lecture III (30 Dec.). "Space and the Strategy of Life," John B. Calhoun (Laboratory of Psychology, National Institute of Mental Health).
Panel Discussion on the Financial Crisis in Science (28 Dec.). Arranged by H. Bentley Glass (Academic Vice President, State University of New York at Stony Brook).	Panel Discussion on Goals for Dallas—Citizen Participation in Shaping the Future of a Major City (31 Dec.). Arranged by B. D. Godbold (Staff Director, Goals for Dallas).
RESA Annual Address and Panel Discussion (28 Dec.). "Technology, Living Cities, and Human Environment," Athelstan Spilhaus (President, Franklin Institute, Philadelphia).	AAAS COMMITTEE SYMPOSIA
George Sartan Memorial Lecture (28 Dec.). "Historical Reflections on the Scientist's Virtue," Owsei Temkin (William H. Welch Professor Emeritus of the History of Medicine, Institute of the History of Medicine, The Johns Hopkins University).	 Committee on Science in the Promotion of Human Welfare and Scientists' Institute for Public Information Unanticipated Environmental Hazards Resulting from Technological Intrusions (28–29 Dec.). Arranged by Robert E. Light (Scientists' Institute for Public In-
Address of the Retiring AAAS President (28 Dec.). "Purists and Politicians," Don K. Price (Dean, John F. Kennedy School of Government, Harvard University).	formation, New York) and Walter Modell (Cornell University Medical College). Committee on Arid Lands Water Importation into Arid Lands (30–31 Dec.).
Review of United States Science Policy (29 Dec.). Arranged by Eugene B. Skolnikoff (Department of Political Science, Massachusetts Institute of Technology).	Arranged by Jay M. Bagley (Utah Water Research Laboratory, Utah State University) and Terah L. Smiley (Department of Geochronology, University of Arizona).

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GENERAL SYMPOSIA			Association for Computing Machinery		
		Genetic Technology: Some Public Considerations (26–27 Dec.). Arranged by Daniel M. Singer (Federation of American Scientists, Weskington D.C.)	• The Direction of Programming Languages for the Scientist (27 Dec.). Arranged by Stan Shannon (Goddard Computer Science Institute, Dallas).		
		can Scientists, Washington, D.C.).	Physics (B)		
		 Sport and its Participants Arranged by Paul Weiss (Yale University). I. The Scientific Basis for Athletic Performances (26 Dec.). II. Conditioning the Human Body: Fitness for Sports and Life (27 Dec.). III. Girls and Women in Play and Sport (27 Dec.). IV. Psychology and Sociology of Sport (28 Dec.). V. Sport and Games (28 Dec.). 	 Section Program Vice Presidential Address, "Trends in Physics Education" (29 Dec.), Stanley S. Ballard (University of Florida). Physics Education for the General Public (29 Dec.). Arranged by Robert N. Little (University of Texas). The Social Relevance of Physics (30 Dec.). Arranged by Albert M. Stone (Applied Physics Laboratory, 		
		Global Effects of Environmental Pollution (26–27	The Johns Hopkins University).		
		Dec.). Arranged by S. Fred Singer (U.S. Department of the Interior, Washington, D.C.).	 American Astronautical Society Bioengineering and Cabin Ecology (30 Dec.). Arranged by William B. Cassidy (LTV Aerospace Corporation, Dallas, Texas). 		
		Space Applications: Earth-Oriented Applications of Unmanned Satellites (28–29 Dec.).	Chemistry (C)		
		Arranged by Paul Rosenberg (Paul Rosenberg Associates, Pelham, New York).	Section Program • Special Topics (26–27 Dec.). Arranged by Ralph		
		Art and Science—Will there be a Difference? (29 Dec.).	L. Shriner (Southern Methodist University).		
MEETING		Arranged by Wilhelm Kluver (Chairman of the Board, Experiments in Art and Technology, Inc., New York).	Astronomy (D) Section Program Centennial of the Birth of George Ellery Hale (27)		
		The New View of the Origin of Life (29 Dec.). Arranged by Sidney W. Fox (University of Miami).	Dec.). Arranged by Charles Weiner (American Institute of Physics).		
— AAAS ANNUAL		The Analysis and Communication of Biological Form (30 Dec.). Arranged by Philip C. Ritterbush (Smithsonian Institution, Washington, D.C.).	 Jupiter and the Outer Planets Arranged by Tobias Owen (IIT Research Institute). I. Atmospheric Composition (29 Dec.). II. Atmospheric Structure (29 Dec.). 		
ORDANIA CHEMICAL COMPRESSOR AND		Earth as a Planet (30 Dec.). Arranged by Frank Press (Massachusetts Institute of Technology).	 III. Atmospheric Dynamics (30 Dec.). IV. Problems of Planetary Origin and Subsequent Atmospheric Evolution (30 Dec.). Pulsars (30 Dec.). Arranged by F. D. Drake (Cornell 		
		SYMPOSIA OF AAAS SECTIONS	University).		
		AND AFFILIATED SOCIETIES	Geology and Geography (E)		
		Mathematics (A) Section Program • Vice Presidential Address, "Connection Between Variational Principles and Stability Phenomena" (29 Dec.), A. H. Taub (University of California, Berkeley). • Comparison of Einstein Theory of Gravitation and Observation (29 Dec.). Arranged by A. H. Taub (University of California, Berkeley).	 ☐ Section Program ◆ Antarctic Research Arranged by Louis O. Quam (National Science Foundation). I. General (26 Dec.). II. Cold Poles and Heat Balance (27 Dec.). III. Conjugate Phenomena (27 Dec.). IV. Dynamics of the Antarctic Ocean (28 Dec.). V. Antarctic Marine and Terrestrial Ecosystems 		
		 American Mathematical Society Third Annual Symposium on Some Mathematical Questions in Biology (27 Dec.). Arranged by Murray Gerstenhaber (University of Pennsylvania). 	(28 Dec.).VI. Glaciology (29 Dec.).VII. Antarctica-Gondwanaland-Continental Drift (29 Dec.).		
	-	 National Council of Teachers of Mathematics Mathematics Education (27 Dec.). Arranged by W. K. McNabb (St. Mark's School of Texas, Dallas). 	 Association of American Geographers Geography and Science (27 Dec.). Arranged by Albert L. Fisher (University of Utah). 		

☐ Geological Society of America

• Environmental Geochemistry in relation to Human Health and Disease (30 Dec.). Arranged by Helen L. Cannon (U.S. Geological Survey, Denver) and Howard C. Hopps (Armed Forces Institute of Pathology, Washington, D.C.).

□ National Speleological Society

- Biological Studies in Texas and Mexican Caves (27 Dec.). Arranged by Robert W. Mitchell and James R. Reddell (Texas Technological College).
- Contributed Papers in Cave Geology (27 Dec.). Arranged by Dwight E. Deal (Sul Ross State College, Alpine, Texas).

Zoological Sciences (F)

Section Program

- Vice Presidential Address, "Whose Real World?" (30 Dec.), Vincent G. Dethier (Princeton University).
- The Physiology of Fighting and Defeat (28 Dec.). Arranged by J. P. Scott (Bowling Green State University) and Basil E. Eleftheriou (Kansas State University).

American Fisheries Society

- Cytogenetics of Fishes. Arranged by Clark Hubbs (University of Texas at Austin).
 - I. Hybridization and Genetics (27 Dec.).
 - II. Cytological Studies (27 Dec.).
 - III. Biochemical Studies (28 Dec.).

☐ American Society of Zoologists

- Past Presidents' Symposium (29 Dec.). Arranged by Howard Bern (University of California, Berkeley).
- Turnover in Biological Systems (27 Dec.). Arranged by Malcolm S. Steinberg.
- Cellular Aspects of the Control of Color Changes (29 Dec.). Arranged by Ronald R. Novales (Northwestern University).
- Contributed Papers on Comparative Endocrinology (27–30 Dec.). Arranged by A. Van Tienhoven (Cornell University).
- Contributed Papers on Comparative Physiology (28–29 Dec.). Arranged by James Case (University of California, Santa Barbara).
- Contributed Papers on Developmental Biology (28– 31 Dec.). Arranged by Malcolm S. Steinberg (Princeton University).
- Penetration of Calcium Carbonate Substrates by Lower Plants and Invertebrates (28–30 Dec.). Arranged by Melbourne R. Carriker (Marine Biological Laboratory, Woods Hole); Edmund H. Smith (University of the Pacific, Stockton, California); Robert T. Wilce (University of Massachusetts).
- Contributed Papers on Invertebrate Zoology (26–27 Dec.). Arranged by Peter E. Pickens (University of Arizona).
- Ecology and Origin of Species (30 Dec.). Arranged by Rezneat M. Darnell.

- Functional Morphology of the Vertebrate Kidney (29 Dec.). Arranged by Thomas S. Parsons (University of Toronto).
- Contributed Papers on Vertebrate Zoology (30–31 Dec.). Arranged by Thomas S. Parsons.
- Contributed Papers on Miscellaneous Subjects (26– 28 Dec.). Arranged by Louis E. Delanney (Ithaca College).

☐ Animal Behavior Society

- Behavior Films (27 Dec.).
- Discussions of Behavior—Maternal Behavior (28 Dec.). Arranged by John G. Vandenbergh (North Carolina Department of Mental Health, Raleigh).
- The Use of Space by Animals and Men. Arranged by Aristide H. Esser (Rockland State Hospital, Orangeburg, New York).
 - I. Relation of Territoriality to Dominance (29 Dec.).
 - II. Factors Influencing Intraspecific Contact (29 Dec.).
 - III. Population Density and Crowding (30 Dec.).
 - IV. The Role of Distance in the Evolution of Communication (30 Dec.).
 - V. Environmental Conditions and Human Behavior (31 Dec.).
- Contributed Papers (27-30 Dec.). Arranged by John G. Vandenbergh.

Herpetologists' League

 Contributed Papers (28–29 Dec.). Arranged by Wilmer W. Tanner (Brigham Young University, Provo, Utah).

Society of Systematic Zoology

- Systematic Significance of Vertebrate Brain Structure (27 Dec.). Arranged by R. Glenn Northcutt (Case-Western Reserve University).
- Problems in Systematics of Parasites (27 Dec.). Arranged by Gerald D. Schmidt (Colorado State University).
- Marine Burrowing Organisms (27 Dec.). Arranged by Bob F. Perkins (Louisiana State University).
- Contributed Papers (28, 30 Dec.). Arranged by Robert P. Higgins (Wake Forest University).

Biological Sciences (FG)

American Institute of Biological Sciences

• Biology and Society (27 Dec.). Arranged by Paul DeHart Hurd (Stanford University).

American Society of Naturalists

• DNA Content and Gene Multiplicity in Higher Organisms (30 Dec.). Arranged by Clement L. Markert (Yale University).

☐ Beta Beta Beta Biological Society

• Biennial Business Meeting (28 Dec.). Arranged by Louise F. Bush (Drew University).

☐ Ecological Society of America

- Adaptations of Intertidal Organisms (27–28 Dec.). Arranged by Charles M. Lent (Beloit College).
- Contributed Papers (30 Dec.). Arranged by Carl D. Monk (University of Georgia).

(Brooklyn College of the City University of New York).

Social and Economic Sciences (K) Section Program • Vice Presidential Address, "What in the New Comparative Studies is Novel in Principle?" (28 Dec.), Guy E. Swanson (University of Michigan). • Science and Public Policy Workshop (30 Dec.). Arranged by Eugene B. Skolnikoff (Massachusetts Institute of Technology). American Sociological Association • Comparative Sociology and Contemporary Social Issues. Arranged by Reuben Hill (University of Minne-I. Theoretical and Methodological Issues in Comparative Sociology (28 Dec.). II. Cross-National Comparisons of the Generation Gap and the Growth of Civil Protests and Political Participation (29 Dec.). III. Comparative Analysis of Social Inequalities (29 Dec.). IV. Socialization for Achievement: Cross-Cultural and Cross-Class Comparisons (30 Dec.). American Society of Criminology Arranged by Donal E. J. MacNamara (The City University of New York). • Criminology and Corrections: Bridging the Gap between Theory and Practice (28 Dec.). • Research Papers in Juvenile Delinquency (28 Dec.). National Institute of Social and Behavioral Science • Contributed Papers (28 Dec.). Arranged by Donald P. Ray (863 Benjamin Franklin Station, Washington, Society for the Scientific Study of Religion. • Values and Metaphysics in Science (30 Dec.). Arranged by Morton King (Southern Methodist Univer-Measuring Individual Differences in Religion (30 Dec.). Arranged by R. L. Gorsuch (Peabody College).

History and Philosophy of Sciences (L)

Section Program
 Vice Presidential Address, "Review of the History of the Development of the Energy Concept up to the Publication of Lagrange's 'Mécanique Analytique' (1788)" (28 Dec.), Robert Bruce Lindsay (Brown University).

• Energy and Society (28 Dec.). Arranged by R. B. Lindsay (Brown University) and Melvin Kranzberg (Case Western Reserve University).

History of Science Society

- New Directions in 17th Century Research (28 Dec.).
 Arranged by Allen G. Debus (University of Chicago).
- Science and Society in Nineteenth-Century Britain (29 Dec.). Arranged by George Basalla (University of Texas).
- Genetics in the Late Nineteenth and Early Twentieth Century (29 Dec.). Arranged by Frederick L. Holmes (Yale University).

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• Work in Progress (30 Dec.). Arranged by Richard S. Westfall (Indiana University). Society for the History of Technology Topics in the History of Technology (27 Dec.). • Industrial Archeology (27 Dec.). Arranged by James C. Hippen (Merrimack Valley Textile Museum, North Andover, Massachusetts) and Robert M. Vogel (Smithsonian Institution). • Technology and Values (29 Dec.). Arranged by Emmanuel G. Mesthene (Harvard University). Technology as a Social Process in Africa (29 Dec.). Arranged by Thomas R. De Gregori (University of Houston). Society for General Systems Research • Metalanguage Dialogues and Metaphorical Synthesis in Education (26 Dec.). The Analysis and Evaluation of a Scientific Field (28) Dec.). • Social Systems in the General Systems Spectrum (28 Dec.). Systems Research in Organization and Management (29 Dec.). • Conflict Resolution and Arms Control (30 Dec.). Engineering (M) Section Program • Space Applications: Earth-Oriented Applications of Unmanned Satellites. Arranged by Paul Rosenberg (Paul Rosenberg Associates, Pelham, New York). I. Earth Observation (28 Dec.). II. Earth Resources (28 Dec.). III. Communications, Navigation, and Public Policy (29 Dec.). IV. Panel Discussion and Summary (29 Dec.). Medical Sciences (N) Section Program • The Control of Fertility (27 Dec.). Arranged by Hudson Hoagland (Worcester Foundation for Experimental Biology). • Molecular Approaches to the Central Nervous System. Arranged by William L. Byrne (University of Tennessee at Memphis). I. Memory Transfer-A Progress Report (29 Dec.). II. Molecular Approaches to Mental Retardation (30 III. Molecular Approaches to Learning and Memory (31 Dec.). □ Alpha Epsilon Delta • Career Opportunities in the Health Professions (28 Dec.). Arranged by Virgil Tweedie (Baylor University). ☐ American Association of Bioanalysts • Some Concepts and Trends in Clinical Bioanalysis (28 Dec.). Arranged by Morton D. Prager (Southwestern

• Mucous Membranes and Their Secretions (27–28 Dec.).

Pharmaceutical Sciences (Np)

Section Program

Arranged by Joseph A. Oddis (American Society of Hospital Pharmacists, Washington, D.C.).

- Luncheon and Vice Presidential Address, "Some Thoughts on Research" (27 Dec.), Andre Archambault (University of Montreal).
- Contributed Papers (27-28 Dec.).
- Distinguished Lecture, "Newer Developments in Cancer Chemotherapy" (28 Dec.), Arnold Welch (The Squibb Institute for Medical Research).

Agriculture (O)

Section Program

- Research for the World Food Crisis. Arranged by Daniel G. Aldrich, Jr. (University of California, Irvine).
 - I. Food Supply and Population Control (27 Dec.).
 - II. New Frontiers in Agricultural Research (28 Dec.).

Sigma Delta Epsilon

• Problems in Feeding the Hungry (29 Dec.). Arranged by Helen R. Skeggs (Merck Institute of Therapeutic Research, West Point, Pennsylvania).

Industrial Science (P)

□ Section Program

- Luncheon and Retiring Vice Presidential Address, "Evaluating Research Results—Before and After" (30 Dec.), Allen V. Astin (National Bureau of Standards).
- Continuing Education for Engineers—Policy and Operating Issues (28 Dec.). Arranged by Zola Bronson (National Science Foundation).
- Current State of Research Management (30 Dec.). (Arranged by Gordon K. Teal (Texas Instruments, Inc.)
- The Current State and Outlook for Research-on-Research (30 Dec.). Arranged by D. W. Collier (Borg-Warner Corporation, Chicago).

Education (Q)

Section Program

- Vice Presidential Address, "Education for Societies in Transition" (27 Dec.), Willard J. Jacobson (Columbia University).
- New Developments in Education Technology.
 Arranged by Harvey J. Brudner (Westinghouse Learning Corporation, New York).
 - I. Computers in Education (26 Dec.).
 - II. Communications and Multi-Media in Education (27 Dec.).
 - III. Individualized Instruction (28 Dec.).
- Education and Societies in Transition (27 Dec.). Arranged by Willard J. Jacobson (Columbia University).
- Individually Prescribed Instruction (28 Dec.). Arranged by David K. Krathwohl (American Educational Research Association, Syracuse, New York).

Section Program

Medical School, Dallas).

Dentistry (Nd)

Dental Science Institute, Houston).

Arranged by Barnet M. Levy (University of Texas





Cotton Bowl, Dallas, Texas [Dallas Chamber of Commerce]

Science Education as It Relates to Technical Education (29 Dec.). Arranged by Jerry S. Dobrovolny (University of Illinois).

☐ American Nature Study Society

- Science, Education, and Society. Arranged by Mrs. J. Lewis Scott (Carnegie Museum, Pittsburgh).
 - I. Unified Knowledge of Man and Environment (27 Dec.).
 - II. The System, Socio-Economic-Political, and Ecosystems (28 Dec.).
 - III. Tailoring Outdoor Programs to Community Needs (29 Dec.).

Commission	n on	Undergraduate	Education	in	the
Biological	Scien	ces			

Arranged by Edward Kormondy (1717 Massachusetts Avenue, NW, Washington, D.C.).

- Teaching College Biology Reading (28 Dec.).
- Teaching-Research: Does Research Have a Beneficial Effect on Teaching? (28 Dec.).
- Biology in the Two-Year College (29 Dec.).

☐ National Science Teachers Association

Arranged by Albert F. Eiss (National Science Teachers Association, Washington, D.C.).

- Developing Scientific Literacy in College Science Courses (28 Dec.).
- A Systems Approach to Science Education (29 Dec.).

☐ Science Teaching Societies

• The Role of Science Education in an Urban Environment (29 Dec.). Arranged by Paul J. Cowan (Northern Texas State University).

Cooperative Committee on the Teaching of Science and Mathematics

• The Flight from Science (29 Dec.). Arranged by Arnold A. Strassenburg (American Institute of Physics).

Information and Communication (T)

□ Section Program

- Vice Presidential Address, "Hangups in Information Networks" (30 Dec.), J. C. R. Licklider (Massachusetts Institute of Technology).
- Science and the Television Media (28 Dec.). Arranged by David Prowitt (National Educational Television Network, New York).
- Science-Knowledge Communications Interfaces (30 Dec.). Arranged by Dale B. Baker (Director, Chemical Abstracts Service).

☐ Society of Technical Writers and Publishers

• Technical Publications: Job Patterns and Qualifications (27 Dec.). Arranged by Ethaline Cortelyou (National Institutes of Health).

Statistics (U)

Section Program

- Vice Presidential Address, "Problems of Communications Between Biologists and Statisticians" (30 Dec.),
 Chester I. Bliss (Connecticut Agricultural Experiment Station).
- Statistical Organizations and Social Problems (27 Dec.). Arranged by Ezra Glaser (U.S. Department of Health, Education, and Welfare).
- New Methodology in Classification (28 Dec.). Arranged by Rosedith Sitgreaves (Columbia University).
- Empirical Sampling Studies (28 Dec.). Arranged by M. Bryan Danford (School of Aerospace Medicine, Brooks Air Force Base, Texas).
- Implications of Educational Statistics in Formulations of Federal Policy (29 Dec.). Arranged by Dorothy M. Gilford (U.S. Office of Education).
- Biological Rhythms (30 Dec.). Arranged by Rosedith Sitgreaves.
- Radioimmuno Assays (30 Dec.). Arranged by Rosedith Sitgreaves.

☐ Biometric Society

Random Counts in Scientific Work (26-27 Dec.).
 Arranged by G. P. Patil (Pennsylvania State University).

General Science (X)

Academy Conference

- Dinner and Presidential Address (27 Dec.), John H. Melvin (Ohio State Academy of Science, Columbus).
- Budgetary Problems of Academies (27 Dec.). Arranged by V. Elving Anderson (University of Minnesota).
- Collegiate Academies of Science (27 Dec.). Arranged by V. Elving Anderson.

□ American Junior Academy of Science

Papers in Physical and Biological Sciences (28 Dec.).
 Arranged by E. L. Wisman (Virginia Polytechnic Institute).