

# History of Physics Newsletter

Volume V, Number 1

February 1992

## ELECTION OF OFFICERS

The election ballots are on the inside of the back page of this Newsletter. Members of the History Division are urged to vote and to return their ballots immediately. The following positions are to be filled:

Vice-Chairperson (to become chairperson the following year), and

Two Executive Committee Members to serve for three years.

## DIVISION NEWS

### APS 1992 MEETINGS

During 1992 the Division of History of Physics has scheduled three sessions of invited papers at general meetings of the APS, and an APS Sponsored Commemorative Session at the University of Chicago.

**Indianapolis, Indiana, "Early Days of the Modern Theory of Solids: A Tribute to Fred Seitz."** March 17th, 1992. The session is being organized by Lillian Hoddeson. David Pines will be Chairperson. The speakers are: *Rudolph Peierls* "Early Work on Solids - Mainly in the 30's." *Fred Seitz* "The Princeton Years and Beyond: 1930-1940." *Lillian Hoddeson* "The Modern Theory of Solids enters Academia and Industrial Laboratories." *Phil Anderson* "When Did Dirty Solids Become Different from Clean Solids?"

**Washington, DC, "Women in Astrophysics."** Tuesday, April 21st, 1992 at 11:00 AM in the South Salon. This session is sponsored by the Divisions of Astrophysics and of History of Physics; C. Stewart Gillmor has organized and will be chair of the session. The speakers are: *Peggy A. Kidwell* "Women in Astrophysics in Historical Perspective." *Dorritt Hoffleit* "Women in Variable Star Research." *Nancy Roman* "Modern Women Astronomers in Varied Careers." *France A. Cordova* Title to be announced.

**Washington, DC, "The Birth of the Nuclear Age - 50 Years Ago."** Thursday, April 23rd, 1992 at 11:00 AM in the South Salon. This session is being organized by A. Wattenberg. Gloria Lubkin will be chairperson. The speakers are: *Ed Creutz* "Some Work with Uranium Before Reactors." *Volney C. Wilson* "Instrumentation and Control of the First Nuclear Reactor." *Al Wattenberg* "The Birth Certificate of the Nuclear Age." *John A. Wheeler* "How to Make a Reactor Work."

### Commemorative Symposia Sponsored by the University of Chicago and the APS

The History Division is assisting in arrangements for commemorating the Centennial of the Physics Department of the University of Chicago on December 1st, 1992 with a symposium which will cover the first fifty years of physics at the University of Chicago. During this period physicists who were at the U. of C. included: Alvarez, Chandrasekhar, A. H. Compton, Michelson, Millikan, and Mulliken. Max Dresden has played a leading role in organizing the December 1st session. Tentatively the invited speakers include: *Elizabeth Garber* "Physical Science at the Time of Chicago's Origin." *John L. Michel* "The Chicago Story of Michelson and Millikan." *Saunders Maclane* "The Impact of Chicago's Mathematics and Physics." *Daniel Siegel* "On Major and Minor Figures in Chicago's Physics." *Alexi Asmus* "Molecular Quantum Theory in the U.S. - Mulliken's Role." *Max Dresden* "The Intellectual Impact of Chicago's Early Science."

The symposium on the second day, December 2nd, 1992, marks the fiftieth anniversary of the experiment at Chicago by Enrico Fermi and his colleagues demonstrating the first controlled self-sustaining nuclear chain reaction, CP-I. The talks will deal with Fermi and the chain reaction. Among the invited speakers are: *Martin Kamen*, *Donald Osterbrock*, *Glenn Seaborg*, *Jack Steinberger*, *Valentine Telegdi*, and *Albert Wattenberg*. During the conference there will be an opportunity to view documentary films on CP-I. The symposia are open to the public. For more information contact Roger H. Hildebrand (312-702-7581) or James W. Cronin (312-702-7102), Enrico Fermi Institute, University of Chicago, 5640 S. Ellis Ave., Chicago, IL 60637.

The History of Physics Newsletter (HPN) is published by the Division of History of Physics of the American Physical Society. It is distributed free to all members of the Division. Others who wish to receive it should make a donation to the Division of History of Physics of \$10 per volume (\$5 additional for airmail). Each volume consists of 5 issues. Editor: Albert Wattenberg, Department of Physics, University of Illinois, Urbana, IL 61801. Associate Editors: Stephen G. Brush, Department of History and Institute for Physical Science and Technology, University of Maryland, College Park, MD 20742, and Elizabeth Garber, History Department, SUNY at Stony Brook, NY 11794.

### Business Meeting of the Division

The annual business meeting of the Division is scheduled for 5:00 PM on Thursday April 23rd at the APS Washington meeting in the Central Salon at the Ramada Techworld. It is not a routine meeting. **The revisions of our Bylaws and a change in name from Division to Forum** will be explained and discussed. The changes are needed to bring us into conformity with the new Constitution and Bylaws of the APS that were approved over a year ago. The Executive Committee of the Division recommended to the general membership that it approve the change in the name to the Forum for the History of Physics. (See page 62 of the previous *History of Physics Newsletter*.) The revisions in the bylaws will be mailed to the present members of the Division prior to the Washington meeting. A vote on the revisions will take place by mail ballot early in May. **PLEASE ATTEND THE BUSINESS MEETING** if you are in Washington.

If the revised bylaws are approved by the membership of the Division of History of Physics, the APS Council needs to vote on formal approval of the revisions. The Council obtains the advice of the APS Committee on Constitution and Bylaws. At its November 1991 meeting, the Council also approved in principle the change in name from the Division of History of Physics to the Forum for the History of Physics.

## APS & AIP NEWS

**APS NEWS Volume I, No. 1** - The first issue of the APS's monthly membership newsletter appeared January 1992 and should have been received by all members of the APS. The newsletter attempts to consolidate the news which had been published in the *Bulletin of the American Physical Society* and the "News From APS"

section of *Physics Today*. These sections of the *Bulletin* and *Physics Today* are now discontinued. APS members will receive the newsletter free of charge. The *Bulletin* will continue to carry information on APS meetings. Beginning in July, members will receive only those issues of the *Bulletin* that they select on the annual membership dues bill.

**Roger H. Stuewer Elected Fellow** At the APS November 1991 Council meeting Roger H. Stuewer was elected Fellow of the APS. He is Professor of History of Science and Technology at the University of Minnesota with faculty appointments in the School of Physics and Astronomy, the Center for the Philosophy of Science, and the American Studies Program. He was Secretary of the History of Science Society, 1972-1978, member and chair of the Executive Committee of the APS Division of History of Physics 1982-88, and Editor, AAPT/AJP Resource Letters since 1978. His books and articles have been in the history of radiation theory, quantum mechanics, and nuclear physics.

**The APS Council Adopted Ethics Guidelines** at its meeting on November 2, 1991. Guidelines for Professional Conduct were established as minimal standards of ethical behavior relating to four aspects of the physics profession. The four aspects are: research results, publication and authorship practices, peer review, and conflict of interest. The complete statement of the Guidelines should be published in *APS News*.

**"Unity Day" at the Washington meeting** is scheduled for Wednesday afternoon, April 22nd, 1992. It is an attempt by the APS to counterbalance the technical specialization and fragmentation of physics. It was first organized at the 1990 spring meeting in Washington, and it was successful enough in 1990 and 1991 to become an annual event. Instead of standard sessions, either special plenary sessions or tutorial sessions are scheduled.

**The International Physics Group is becoming a Forum.** The change in status allows the group to organize sessions at meetings, to nominate Fellows, and to elect a voting representative to the APS Council after its bylaws are approved. Because Europe, Japan, and the U.S. already have well established means of communicating, the group has focused its efforts since 1983 on developing countries. The group feels that there is a great need to help the physi-

cists in third world countries to contribute to the global world of physics. Membership in APS Forums is free. You must indicate your desire to be a member of a Forum on your annual APS dues bill.

**AIP & The Center for History of Physics will move to Maryland.** The AIP building in New York is for sale. Plans are well underway for a new building in College Park, Maryland which will be the headquarters for the AIP, the APS, and the AAPT and will be called "the American Center for Physics" (ACP). The Center for History of Physics will move with the AIP. The Niels Bohr Library will be a featured architectural element. The Library has had a space problem in its present location, and it will get more than double the space for both books and archival materials. An excellent reading area is being planned.

While preparing for the move some reductions in Library services may be necessary as early as the fall of this year. The new building may be available in late 1993, but 1994 is more probable.

**Friends of the Center for History of Physics.** One of the sources of financial support for the History of Physics is the Friends of the AIP Center, a group of individuals who make voluntary contributions. The Friends' funds pay for Library acquisitions, cataloging, special documentations, grants-in-aid for scholars, etc. We urge you to join the Friends and contribute to the funds that are used directly for work to preserve and make known the history of the modern physical sciences.

**Center for History of Physics Newsletter.** The November 1991 AIP History Newsletter includes a notice concerning expanded access to **Information on Source Materials for History of Physical Sciences.** The AIP Niels Bohr Library can now give greatly improved services to scholars inquiring about the location and contents of historical source materials in the Library and elsewhere around the world. The fields covered include: physics, astronomy, geophysics, optics, and numerous allied subjects. As readers of the Center's Newsletter are aware, the AIP Center is in the middle of major projects to expand its International Catalog for Sources for the History of Physics and Allied Sciences and to fully catalog AIP's own extensive collections. Thousands of records have been transferred to a computerized database. Direct ac-

cess to the database on-line is still several years off. Meanwhile anyone seeking information about unpublished material in the history of physics is welcome to direct an inquiry to the Niels Bohr Library Staff.

Other articles in the same issue of the Center's *Newsletter* report on new oral interviews in high-energy physics, new acquisitions by the Niels Bohr Library, the Acoustical Society of America's survey and archival project, and the preservation of documentation. The Center's *Newsletter* is available without charge by writing to: Center for History of Physics, American Institute of Physics, 335 East 45th Street, New York, NY 10017. They welcome donations (tax-deductible).

## ANNOUNCEMENTS & REPORTS

### **An Encyclopedia on History of the Geosciences**

Work has begun on an Encyclopedia which is planned to cover a wide range of subjects in the history of the geosciences, including geophysics, geology, oceanography, meteorology, and space science. It will encompass a broad chronological range and is intended to provide an overview of current scholarship and new directions in this field. Inquiries should be addressed to the editor Dr. Gregory A. Good, History Department, West Virginia University, Morgantown, WV 26506.

### **Gooding and Addis Awarded Grant to Study Faraday's Researches.**

David Gooding of the University of Bath and Tom Addis of Reading University have been awarded a grant £140,000 for a "Dynamical Representation of Faraday's Experimental Researches." It will be a two year study of the structures and strategies to be found in Michael Faraday's research notebooks and publications. It will introduce into computer-based research on learning and discovery a much needed focus on the exploratory and qualitative aspects of innovation in science and technology. For further information contact David Gooding, Natural Intelligence Project, Science Studies Centre, University of Bath, Bath BA2 7AY England.

### HSS "Guide for Undergraduates"

A pamphlet-sized guide is published by the History of Science Society to introduce students to the history of science and to indicate how the subject fits into various career plans. Michael J. Crowe's *History of Science: A Guide for Undergraduates* is available free of charge for single copies. Orders for multiple copies will be sent at cost, as follows: \$1.00 per copy or 75 cents each for ten or more copies in the U.S.; outside the U.S., \$1.50 per copy, or \$1.00 each for ten or more copies. Send requests for copies to Michael M. Sokal, Executive Secretary, History of Science Society, 35 Dean Street, Worcester, MA 01609.

### Institute in Göttingen

In September 1990, the University of Göttingen inaugurated a new Institute for the History of Science. As of 1992, the new Institute will move to quarters spacious enough to accommodate a limited number of visiting scholars whose research interests bring them to Göttingen's excellent library and archives. The Director of the Institute is Professor Lorraine Daston, History of Science.

### NEH Grant to Einstein Papers Project

The National Endowment for the Humanities has given an institutional grant of \$118,000 to the Princeton University Press for an edition of the papers of Albert Einstein. The project director is Martin J. Klein of Yale University who is the current chairperson of the Division of History of Physics.

### National Archives

In the February 1990 issue of this newsletter, we reported that building for the new addition to the National Archives, designated Archives II, had been started in the fall of 1989 and that construction should be completed in 1993. It is in College Park, MD near the American Center for Physics. Records relating to the U.S. history of science may be moved to Archives II. The Archives will be publishing a quarterly *Researcher Bulletin* which will report on developments related to the move. The bulletin will have information about records not only in the Washington area but also at the regional archives. They will provide names and telephone numbers that may be useful contacts for researchers. For free copies, write to the Textual Reference Division (NNR), National Archives, Washington, DC 20408.

The total FY'92 appropriation for the Archives was a \$14 million increase over FY'91. The FY'92 budget for the National Archives included \$5.2 million earmarked for the **National Historical Publications and Records Commission's** grant program. The National Historical Publications and Records Commission was considering a long range planning document which would set goals for the Commission. For more information on the Commission, write to Dr. Page P. Miller, Director, National Coordinating Committee for the Promotion of History, 400 A Street SE, Washington, DC 20003, or telephone (202)-544-2422.

### "Science and Education" a new journal

Kluwer Academic Publishers has announced a new journal to be edited by Michael R. Matthews of the School of Educational Studies, University of New South Wales, Kensington, Australia. Included in the goals that *Science and Education* promotes are: 1) The utilization of historical, philosophical, and sociological scholarship to clarify and deal with the many intellectual issues facing contemporary science and mathematics education, and 2) the inclusion of appropriate history and philosophy of science and mathematics courses in science and mathematics teacher-education programmes. **Call for Papers** - Authors wishing to submit papers relating to the above themes or topics are invited to send four copies of the manuscript to *Science and Education* c/o Journals Editorial Office, Kluwer Academic Publishers, P.O. Box 17, 3300 AA Dordrecht, The Netherlands. Detailed instructions for authors are also available from the same address.

### Smithsonian Institution Archives

The Smithsonian Videohistory Program has completed a series on the Manhattan Project. Stanley Goldberg, consulting historian for the National Museum of American History, recorded eighteen video sessions with fifty-five participants involved in the engineering, physics and culmination of the Manhattan Project. Goldberg examined the research and technologies necessary to realize the uranium and plutonium bombs. He supplemented interviews with visual documentation of the industrial plants that refined and separated the isotopes, and of the machinery that delivered and dropped the bombs. Interviewees explained the other steps in designing, building, testing and detonating an atomic bomb. Discussion with participants also elicited a social history of the Project as recalled by men

and women with different duties in different locales. Between January 1987 and June 1990 the sessions were recorded on-site or in-studio in Hanford, Boston, Oak Ridge and Knoxville, Alamogordo and Los Alamos, Washington D. C. and Suitland MD. They are divided into five collection divisions, Hanford, Oak Ridge, Cambridge, Los Alamos and Alberta. Transcripts and finding aids have been prepared for each of the sessions. For more information contact: The Videohistory Archives, Arts and Industry Building, The Smithsonian Institution, Washington, D. C. 20560.

## MEETINGS

**Anglo-North American HSS, BSHS, & Canadian Joint Meeting in Toronto** As announced in the previous issue of this Newsletter (pg. 64), the History of Science Society, the British Society for the History of Science, and the Canadian Society for the History and Philosophy of Science will jointly sponsor a meeting on the theme of the "History of Laboratories and of Laboratory Science." Three full days of meetings will be held on the 26th-28th of July 1992 in Toronto at Victoria College on the campus of the University of Toronto. Room reservations must be made prior to June 25th. To obtain registration forms and other information about the meetings, write to Professor M.P. Winsor, Local Arrangements Chair, Institute for History and Philosophy of Science and Technology, Room 316, Victoria College, University of Toronto, Toronto, Ontario M5S 1K7 Canada.

**Bicentennial of Birth of John Herschel & Centennial of Deaths of J.C. Adams and G.B. Airy** - The Royal Institution Committee for the History of Science has planned a meeting to commemorate the work of these **Nineteenth Century Astronomers**. The meeting will be at the National Maritime Museum in Greenwich on the 14th of November 1992. Offers of paper should be sent to Dr. Frank A.J.L. James, RICHST, Royal Institution, 21 Albermarle St. London, W1X 4BS England.

**Bicentenaire de Lavoisier** - Le Comité Lavoisier de l'Academie des Sciences will mark the bicentenary of the execution of Lavoisier with a number of events in Paris from May 3rd to 6th, 1994. Further details can be obtained from Michele Goupil, Secrétaire du Comité Bicentenaire Lavoisier, Academie des Sciences, 23 Quai Conti, 75006 Paris, France.

**European Physical Society-History of Physics Interdivisional Group** is organizing two conferences in 1992. a) First Europhysics Conference in Como Italy September 2nd-3rd, 1992 entitled "History of Physics in Europe in the 19th and 20th Centuries." b) Madrid, Spain September 9th-11th, 1992 entitled "History of Physical-Mathematical Sciences and the Teaching of Physics." The targets for discussion at the Como meeting are: a) to analyse major historiographical trends (mostly studied periods, types of questions, and relationships with other disciplines); b) to analyse recent results (e.g. on the emergence of theoretical physics in the 19th century, the development of relativity theory, quantum theory, nuclear and particle physics); c) to outline the existence and organization of archival materials and projects in Europe.

The Madrid meeting forms part of a series of international meetings held at Pavia (1983), Munich (1986), Paris (1988) and Cambridge (1990) and constitutes an opportunity to exchange experiences and criteria on the didactical applications of history of science. If you are interested in presenting a short paper, write immediately to Fabio Bevilacqua, Dipartimento di Fisica, "A. Volta," Università degli Studi di Pavia, via A. Bassi 6, Pavia 27100, Italy (fax +39-(392)-392563) or to Dr. Antonio Moreno Gonzalez, Departamento de Didáctica de las Ciencias Experimentales, Escuela Universitaria de Formación de Profesores "María Díaz Jiménez" Avda. Filipinas, 3, 28003-Madrid (Spain).

**History of Oceanography-Fifth International Congress** will take place at LaJolla, California in July 1993. This meeting will mark the 90th anniversary of the founding of the Natural History Society of San Diego's Marine Laboratory which is now known as the Scripps Institution of Oceanography. Further details can be obtained from Philip H. Rehbock, Department of History, University of Hawaii, 2530 Dole Street, Honolulu, HI 96822.

**The History of Particle Physics - 3rd International Symposium** will be held at SLAC (the Stanford Linear Accelerator Center) beginning on June 24th and continuing through Saturday June 27th, 1992. This symposium is the third in a series that began at Fermilab in 1980. Unlike the previous symposia, this one will concentrate on a single intellectual theme: the "rise of the Standard Model." The focus will be on the core period 1964 to 1979, although related events that happened before and after this period will be included in the program.

Steven Weinberg will deliver the opening talk and Sheldon Glashow will summarize the symposium. The banquet speaker is Murray Gell-Mann. The speakers include some of the physicists who made theoretical contributions or experimental measurements which led to the "Standard Model." Leading historians and philosophers of science have agreed to present talks. A number of well known physicists and scholars have been invited to comment on presentations or to serve on panels. The organizers of the symposium are Lillian Hoddeson, Michael Rioridan, Laurie Brown, Max Dresden, and Nina Adelman Stolar. For further information, contact Nina Stolar, SLAC Bin 70, P.O. Box 4349; Stanford, CA 94309. FAX (415)-926-4999.

**The Carnegie Institution of Washington and the AGU** - The History Committee of the American Geophysical Union and the Carnegie Institution are sponsoring a symposium entitled: "The Earth, the Heavens, and the Carnegie Institution of Washington: Historical Perspectives After 90 Years." The Symposium will run from Sunday evening, June 14th through Wednesday June 17th, 1992 at the Carnegie Institution's administrative building at 1530 P Street NW, Washington, DC. About 25 papers and commentaries will be presented on the Institution's various laboratories and observatory. For the program and form for registration write to Dr. Gregory A. Good, History Department, West Virginia University, Morgantown, WV 26506.

**HSS 1992 Annual Meeting** - The History of Science Society will hold its 1992 annual meeting in Washington, DC from the 27th to the 30th of December, concurrently with the American Historical Association's meeting. After March 15th, individual papers will be considered for works in progress sessions. **Grants for travel to the annual meeting** are awarded by the HSS to independent scholars. These grants are primarily for presenting papers or works in progress. Send papers and/or request for information to either of the program organizers: Karl Hufbauer, Department of History, University of California at Irvine, Irvine, CA 92717 or Ted Porter Department of History, UCLA, 405 Hilgard Ave., Los Angeles, CA 90024-1473.

**The International Union for the History and Philosophy of Science**, Division of History of Science, has scheduled its XIXth International Congress of History of Science on the 22nd to 29th of August 1993 in Zaragoza, Spain. As usual the Congress will consist of Symposia of

special interest and Scientific Sessions devoted to various branches of the history of science. Circulars containing information on the meeting may be requested from Mariano Hormigon, Facultad de Ciencias (Matemáticas), Ciudad Universitaria, E-50009, Zaragoza, Spain.

**The 1992 4S/EASST Joint Conference** - The University of Göteborg's Department of Theory of Science & Center for Science Studies will host a joint conference of the Society for the Social Studies of Science and the European Association for the Study of Science and Technology during August 12th-15th, 1992. For more information contact: Aant Elzinga or John Hultberg, Department of Theory of Science & Centre for Science Studies, University of Göteborg, Sweden.

**Science Teaching** - The Second International Conference on History and Philosophy in Science Teaching will be held at Queens College in Kingston on May 11th-15th, 1992. It is anticipated that participants from more than twenty countries will include: science teachers, science teacher educators, educational policy makers, scientists, and historians and philosophers of science. The first conference held at Florida State University at Tallahassee focused on science teaching in the high school. For the 1992 meetings the focus has been broadened to include science in the elementary school. David Hawkins, well known for his work not only in the history and philosophy of science but also in the development of elementary science curriculum, is Honorary Conference Chairperson. Among other prospective participants are: Philip Morrison, Fabio Bevilacqua, Richard Westfall, James Cushing, and Peter Heering. For further information write to Dr. Skip Hills, Faculty of Education, Queen's College, Kingston, Ontario K7L 3N6 Canada.

## GRANTS & FELLOWSHIPS

### AIP Center for History of Physics

The Center for History of Physics has a program of grants-in-aid for research in the history of modern physics and allied sciences (such as astronomy, geophysics, and optics) and their social interactions. Grants can be up to \$2000 each. They can be used only to reimburse direct expenses connected to the work. Preference will be given to those who need part of the funds for travel and subsistence to use the Niels Bohr Library in New York City or to microfilm papers

or to tape-record oral history interviews with a copy deposited in the Library. Applicants should either be working toward a graduate degree in the history of science (in which case they should include a letter of reference from their thesis advisor), or show a record of publication in the field. For more information, write to Spencer Weart, Center for History of Physics, American Institute of Physics, 335 East 45th Street, New York, NY 10017. Deadlines for receipt of applications are June 30 and December 31 of each year.

### **American Philosophical Society, General Research Grants Program**

The Philosophical Society awards postdoctoral grants toward the cost of scholarly research in all areas of knowledge except those in which support by government or corporations is more appropriate and regularly available. Deadlines are the first day of: February, April, August, October, and December. For additional information contact, the Committee on Research, American Philosophical Society, 104 South 5th Street, Philadelphia, PA 19106.

### **The American Philosophical Society's John Clarke Slater Fellowships**

The Society invites doctoral candidates writing dissertations on the history of modern science to apply. In 1991 the Slater Fellowships carried a stipend of \$12,000. In previous years the application deadline was December 15th. For application forms and further information, write to: Slater Fellowship, Executive Office, American Philosophical Society, 104 South Fifth Street, Philadelphia, PA 19106.

### **The Bakken Library and Museum of Electricity in Life**

The Bakken encourages the utilization of its collections by offering funds of up to \$1,000 for short study visits. Applicants should submit brief research proposals and complete curriculum vitae to The Director, The Bakken, 3537 Zenith Avenue South, Minneapolis, MN 55416.

### **National Coalition of Independent Scholars**

This Coalition publishes a *Grants Handbook* (by Georgia Wright) which is available to NCIS members; membership costs \$10 per year. For more information contact Joane Lafler, Secretary, NCIS, 43 Abbott Drive, Oakland, CA 94611.

### **National Endowment for the Humanities**

The previous issues of this *History of Physics Newsletter* contained information about the various Divisions of NEH and the opportunities for Fellowships and Grants. We hope that you obtained the most recent issue of the "Overview" by having written to "Overview", Room 406, National Endowment for the Humanities, 1100 Pennsylvania Avenue, NW, Washington, DC 20506. If you misplaced your copy of the "Overview" or if you never received one, the following programs have **DEADLINES** that occur before the next issue of this newsletter. The names and telephone numbers of the persons to call are listed after the program: (The area code for all telephone numbers is 202.)

#### **NEH Division of Fellowships:**

Fellowships for University Teachers - Maben D. Herring...786-0466 June 1, 1992.  
Fellowships for College Teachers and Independent Scholars - Joseph B. Neville... 786-0466 June 1, 1992.  
Summer Stipends - Thomas O'Brien...786-0466 October 1, 1992.  
Travel to Collections - Kathleen Mitchell...786-0463 July 15, 1992.  
Younger Scholars - Leon Bramson...786-0463 November 1, 1992.  
Study Grants for College and University Teachers - Clayton Lewis ...786-0463 August 15, 1992.

#### **Division of Research Programs:**

Reference Materials: Tools - Helen Agüera...786-0358 September 1, 1992.  
Reference Materials: Guides - Jane Rosenberg...786-0358 September 1, 1992.  
Interpretive Research: Humanities, Science and Technology - Daniel Jones...786-0210 October 15, 1992.

To receive guidelines for any NEH program, contact the Office of Publications and Public Affairs at (202) 786-0438. Guidelines are available at least two months in advance of application deadlines.

### **National Science Foundation - SBES Directorate and SSTS**

In October Walter Massey, Director of the NSF, announced the formation of a separate directorate for the social, behavioral, and economic sciences (SBES). The new directorate houses many social, political, and cognitive sciences as well as STS. At first it was possible that the programs related to the history, philosophy, and

social study of science and technology would not be moved to the new directorate. However these programs are now located in an office called Studies in Science, Technology, and Society (SSTS) in SBES. The most recent *Program Announcement* that has been received by the editor of this newsletter is NSF 91-09. SSTS programs which are included and may support projects of interest to historians of physics are:

**SSTS Scholar Awards.** These normally support individual researchers for part or all of an academic year, for summer research, or for some combination of academic year and summers. Awards allow up to \$15,000 for partial support of full time summer research and/or related costs or up to \$50,000 for partial support for full time academic year release time and related expenses.

**Professional Development Fellowships (PDF)** for researchers who wish to improve and expand their skills in the areas of SSTS (for physical and natural scientists and engineers) or in areas of science and engineering (for researchers trained in ethics, history, philosophy, or social studies of science). Physicists may use this award to work with a historian, philosopher or social scientist to learn the methods of research in SSTS. These awards provide as much as \$50,000 for support of a full time academic year of study and research outside the applicants' current area of expertise. PDFs must contain both a training and research component. Letters from host scholars, describing their plans to work with the applicants, and from the host institutions, agreeing to provide appropriate space and facilities, must accompany these proposals.

**Extraordinary Expenses for Dissertation Research** may receive support. For further information please request "Grants for Improving Doctoral Dissertation Research," NSF 89-32.

**Support for Instrumentation** proposals as supplements to existing awards. Instrumentation includes: CD-ROM readers, portable computers for research in archives and libraries, etc. Priority will be given to requests that involve all faculty and graduate students in a department. The NSF does not normally support the purchase of personal computers.

If there are any questions about SSTS awards, contact: Ronald Overmann or Rachele Hollander, Studies in Science, Technology, and Society, National Science Foundation, 1800 G

Street NW, Washington, DC 20550, or telephone (202) 357-9894. Electronic mail address: rholland@nsf or roverman@nsf (Bitnet).

### **STIS, the Science and Technology Information System at NSF**

STIS is a new electronic dissemination system that will become available in March. It provides easy access to National Science Foundation publications 24 hours a day on Internet or by a modem. The Internet access for STIS is the single command - *telnet stis.nsf.gov*. To copy a publication, an Internet user can: conduct an anonymous FTP (File Transfer Protocol) session, or request that a publication be delivered via e-mail, or print material from a screen display. Anyone with a modem and communication software to emulate a VT-100 can access STIS. The user will pay a phone charge if the call is long distance. The details are simple but the number of options available would use an appreciable amount of space in this Newsletter. Therefore, we suggest that you obtain more information by writing to Dr. STIS, National Science Foundation, Office of Information Systems, 1800 G Street NW (Room 401), Washington, DC 20550.

## BOOK PUBLISHERS

### **Adam Hilger**

*John Roche* editor **Physicists look Back: Studies in the History of Physics.**

*J. M. Thomas* **Michael Faraday and the Royal Institution.** For more information write: Adam Hilger, IOP Publishing, Techno House, Redcliffe Way, Bristol BS1 6NX, United Kingdom. The North American distributor of Adam Hilger is the American Institute of Physics c/o AIDC, 64 Depot Road, Colchester, VT 05445.

### **American Institute of Physics**

*Hanbury Brown* **Boffin. A personal Story of the early Days of Radar and Radio Astronomy and Quantum Optics.**

*D. G. Caldi* and *G. D. Mostow* editors

**Proceedings of the Gibbs Symposium** A conference that reviewed the achievements of Josiah Willard Gibbs and his contributions to a broad range of disciplines within physics and beyond.

*S. D. Drell* and *S. P. Kapitza* editors **Sakharov Remembered** Essays and photographs by friends and colleagues from the Soviet Union and the United States.



*Katherine S. Sopka* compiler **Physics for a New Century Papers** presented at the 1904 St. Louis Congress of Arts and Sciences. Authors include Ernest Rutherford, Henri Poincaré, Paul Langevin and Ludwig Boltzmann.

*Hans Bethe* **The Road from Los Alamos** This is a collection of Bethe's essays on the atomic and hydrogen bombs, disarmament, reducing the risks of nuclear war, the overproduction of nuclear weapons and his portraits of Oppenheimer, Freeman Dyson, Hermann Hoerlin, Feynman and Paul Ewald. There are two essays on astrophysics.

*Sheldon L. Glashow* **The Charm of Physics** Essays on particle physics, quarks, the role of the theorist in physics and the role of the physicist in society.

*Frank von Hippel* **Citizen Scientist** These essays range from critiques of the nuclear arms race to considerations of the impact of nuclear accidents and automobile efficiency and the blessings of dissent. For more information write: American Institute of Physics, 335 East 45th St., New York, New York 10017. To order write: American Institute of Physics c/o AIDC, 64 Depot Road, Colchester, VT 05446.

#### American Nuclear Society

*James W. Behrens* and *Allan D. Carlson* **Fifty Years with Nuclear Fission** 2 vols. For more information write: American Nuclear Society, Lagrange Park, IL.

#### Basic Books

*Grigori Medvedev* **The Truth about Chernobyl** This is the account of the accident by the former chief engineer at Chernobyl, commissioned to determine what happened.

*Victor Weisskopf* **The Joy of Insight: Passions of a Physicist.** For more information write: Basic Books Inc., Dept. HS, 10 East 53rd St., New York, NY 10022.

#### Birkhäuser Verlag, Boston

*V. I. Arnold*'d **Huygens and Barrow, Newton and Hooke.** For more information write: Birkhäuser Boston Inc., P.O. Box 2485, Secaucus, NJ 07096-2491.

#### E. J. Brill

*Janice A. Henderson* **On the Distances between the Sun, Moon and Earth.** For more information write: E. J. Brill, 24 Hudson Street, Kinderhook, NY 12106.

#### Brookings Institution

*Bruce L. R. Smith* **American Science Policy since World War II.** For more information write: Brookings Institution, 1775 Massachusetts Ave., Washington, D. C. 20036.

#### University of California Press

*Bernard le Bouvier de Fontenelle* **Conversations on the Plurality of the Worlds** Trans. H. A. Hargreaves. First published in 1686 in the form of dia-

logues. Fontenelle presented to the educated French public the daring cosmology based upon Copernican astronomy.

*Paul R. Josephson* **Physics and Politics in Revolutionary Russia.**

*Hans Reichenbach* **The Direction of Time.** For more information write: University of California Press, Berkeley Way, Berkeley, CA 94720.

#### Cambridge University Press

*Fin Aaserud* **Redirecting Science: Niels Bohr, Philanthropy and the Rise of Nuclear Physics.**

*Brian Balogh* **Chain Reaction: Expert Debate and Public Participation in American Commercial Nuclear Power, 1945-1975.**

*Betty Jo Teeter Dobbs* **The Janus Face of Genius: Alchemy in Newton's Thought.**

*Marie Boas Hall* **Promoting Experimental Learning: Experiment and the Royal Society, 1660-1727.**

*Benjamin F. Howell* **An Introduction to Seismological Research: History and Development.**

*Daniel M. Siegel* **Innovation in Maxwell's Electromagnetic Theory: Molecular Vortices, Displacement Current and Light.**

*Victor E. Thoren* **The Lord of Uraniborg: A Biography of Tycho Brahe.**

#### Reissued in Paperback

*Otto Frisch* **What Little I Remember.**

*Bruce Wheaton* **The Tiger and the Shark: Empirical Roots of Wave-Particle Dualism.** For more information write: Cambridge University Press, 32 East 57th St., New York, NY 10022

#### University of Chicago Press

*N. Katherine Hayles* editor **Chaos and Order: Complex Dynamics in Literature and Science.**

#### Reissued in Paperback

*Christa Jungnickel* and *Russell McCormmach* **Intellectual Mastery of Nature** 2 vols. For more information write: University of Chicago Press, 5801 South Ellis Avenue, Chicago, IL 60637.

#### Cornell University Press

*Kathryn Olesko* **Physics as a Calling: Discipline and Practice in the Königsberg Seminar for Physics.** For more information write: Cornell University Press, 124 Roberts Pl., Box 250 Ithaca, NY 14851.

#### Dover Publications

*George Gamow* **Great Physicists from Galileo to Einstein.** For more information write: Dover Publications Inc., 31 East 2nd Street, Mineola, NY 11501.

**W. H. Freeman**

*David C. Cassidy Uncertainty: The Life and Science of Werner Heisenberg* This is the first full-scale biography of Heisenberg. It traces his life through the first World War, the development of quantum mechanics and his Nobel Prize, the developing power of the Nazi party, their dictatorship and Heisenberg's work in nuclear research through World War II. For more information write: W. H. Freeman and Co. Publishers 41 Madison Avenue, New York, New York 10010.

**Garland Publishing**

*John Philips Britton Models and Precision: The Quality of Ptolemy's Observations and Parameters* A reexamination of Ptolemy as an observer. The author counters the view of Ptolemy as an inferior observer and a manipulator of data by comparing Ptolemy's work with his predecessors. He concludes that Ptolemy's errors were consistent with naked-eye observations and his parameters are more accurate than expected. Ptolemy was more accurate and skilled than has been recognized.

*J. L. Bergreggren and R. S. D. Thomas* translators *Euclid's Phaenomena* This is a translation and study of an early treatise in spherical geometry the mastery of which was an important step in the development of a rational astronomy. For more information write: Garland Publishing, 1000A Sherman Avenue, Hampden, CT 06514.

**Hambledon Press**

*A. C. Crombie Science, Optics and Music in Medieval and Early Modern Thought*. For more information write: Hambledon Press, 102 Gloucester Ave., London NW1 8HX United Kingdom.

**James and James**

*Sir Nevill Mott Can Scientists Believe? Some Examples of the Attitude of Scientists to Religion*. In a series of essays scientists and historians examine the issue as believers. There are three articles by physicists and two from historians of science. For more information write: James and James, 75 Carleton Road, London N7 0ET England.

**Johns Hopkins Press**

*Karl Hufbauer Exploring the Sun: Solar Science since Galileo*. For more information write: Johns Hopkins University Press, 701 West 40th St., Suite 275, Baltimore, MD 21211.

**Kluwer Academic Publishers**

*Kamerlingh Onnes Through Measurement to Knowledge: The Selected Papers of Kamerlingh Onnes (1853-1926)*. For more information write: Kluwer Academic Publishers, P. O. Box 358, Accordia Sta., Hingham, MA 02108-0358.

**Macmillan**

*Geoffrey N. Cantor Michael Faraday, Sandemanian and Scientist: A Study of Science and Religion in the Nineteenth Century*.

*A. J. L. James* editor *The Development of the Laboratory* The essays collected here cover the beginnings of the modern academic teaching and research laboratories in chemistry then focus on those of physics in the nineteenth and twentieth centuries. For more information write: Macmillan Publications, 866 Third Avenue, New York, NY 10022.

**McGill-Queens University Press**

*Yves Gingras Physics and the Rise of Scientific Research in Canada* Peter Keating, translator.

**MIT Press**

*Joan Lisa Bromberg The Laser in America: 1950-1970*. For more information write: MIT Press, 55 Hayward St., Cambridge, MA 02142.

**Museum Boerhaave**

*Peter de Clerq The Leiden Cabinet of Physics*.  
*E. Dekker The Leiden Sphere, an exceptional seventeenth-century Planetarium*.  
*Anne C. van Helden The Coldest Spot on Earth: Kamerlingh Onnes and Low Temperature Research (1882-1923)*. For more information write: Museum Boerhaave, Leiden, The Netherlands.

**University of New Mexico**

*Necah Stewart Furman Sandia National Laboratories: The Postwar Decade*.

**Oxford University Press**

*Peter Achinstein Particles and Waves: Historical Essays in the Philosophy of Science*. Discusses cases in 19th century physics.  
*Lillian Hoddeson, Ernest Braun, Jürgen Teichmann and Spencer Weart* editors *Out of the Crystal Maze: The History of Solid State Physics*. For more information write: Oxford University Press, 2001 Evans Road, Cary, NC 27513.

**Princeton University Press**

*David Park The How and Why: An Essay on the Origins and Development of Physical Theory*.  
*Jürgen Renn and Robert Schulmann* editors *Albert Einstein/Mileva Maric: The Love Letters*.  
*Tony Rothman A Physicist on Madison Avenue*.  
*John Servos Physical Chemistry from Ostwald to Pauling: The Making of a Science in America*. This book received the Pfizer award of the History of Science.

**Paperback**

**Tony Rothman Science à la Mode: Physical Fashions and Fictions.** For more information write: Princeton University Press, 3175 Princeton Pike, Lawrenceville, NJ 08648.

**Rodopi**

**C. S. Maffioli Italian Scientists in the Low Countries in the Seventeenth and Eighteenth Centuries.**

**R. P. W. Visser, H. J. M. Bos, L. C. Palm and H. A. M. Snelders New Trends in the History of Science Proceedings of an International Conference at the University of Utrecht.** For more information write: Rodopi Editions, Keizersgracht, 302-304 Amsterdam 1016, The Netherlands.

**Royal Museum of Scotland**

**J. Burnett "Vulgar and Mechanick": The Scientific Instrument Trade in Ireland, 1680-1921.** For more information write: Royal Museum of Scotland, Chambers Street Edinburgh EH1 1JF, Scotland.

**Salem Press**

**Frank N. Magill editor Nobel Prize Winners: Physics.** 3 vols. For more information write: Salem Press, P. O. Box 1097 Englewood Cliffs, NJ 07632.

**Science History Publications**

**William R. Shea The Magic of Numbers and Motion: René Descartes' Scientific Career.**

**Marcello Pera and William R. Shea editors Persuading Science: The Art of Scientific Rhetoric** Two aspects of the role of rhetoric are examined, the more general question and specific case studies. Of interest are Richard S. Westfall, "Galileo and Newton: Different Rhetorical Strategies," William R. Shea, "Descartes and the Art of Persuasion," Maurizio Mamiani, "The Rhetoric of Certainty: Newton's Method in Science," and Gerald Holton, "Quanta, Relativity and Rhetoric." For more information write: Science History Publications. P.O. Box 493, Canton MA 02021.

**Springer-Verlag**

**E. Benvenuto An Introduction to the History of Structural Mechanics** 2 vols. For more information write: Springer-Verlag New York, P. O. Box 2485, Secaucus, NJ 07096-2491.

**State University of New York Press**

**Darryl E. Chubin and Edward J. Hackett Peerless Science: Peer Review and U. S. Science Policy.** For more information write: State University of New York Press, SUNY Plaza, Albany, NY 12246.

**Taylor and Francis**

**Michael Faraday Experimental Researches in Chemistry and Physics.** For more information write: Taylor and Francis, Suite 1106, 79 Madison Ave., New York, NY 10016.

**University of Toronto Press**

**Stillman Drake Galileo, Pioneer Scientist.**

**J. W. Grove In Defense of Science: Science, Technology and Politics in modern Society.** For more information write: University of Toronto Press, 340 Nagel Drive, Checktowaga, NY 14225.

**Variorum**

**Gerald L'Estrange Turner Scientific Instruments and Experimental Philosophy, 1550-1850.** This is a collection of papers published by Prof. Turner over the last twenty-five years on various aspects of the making, marketing, using and collecting of scientific instruments and books. For more information write: Gower Publishing Company, Old Post Road, Brookfield, VT 05036.

**World Scientific**

**K. Martnás, L. Ropolyi and P. Szegedi editors Thermodynamics: History and Philosophy** Proceedings of an International Conference, Veszprém, Hungary, July, 1990. For more information write: World Scientific Publishing Co. Inc., Suite 18, 1060 Main Street, River Edge, NJ 07661.

**RECENT ARTICLES****American Journal of Physics**

1990, vol. 58

"Resource Letter MM-1: Magnetic Monopoles," *Alfred S. Goldhaber and W. Peter Tower*, 429-439. The tale of magnetic monopoles is developed historically through comments on important papers and treatises.

"Hermann von Helmholtz and his Student in abstentia—C. V. Raman," *S. Ramaseshan*, p. 519. "Harriet Brooks—Pioneer Nuclear Scientist," 899-901 and "Pioneer Women in Nuclear Science," *M. F. Rayner-Canham and G. W. Rayner-Canham*, 1036-1043. "Electron wave-like Behavior: A Historical and Experimental Introduction," *G. Matteucci*, 1143-1147.

**British Journal for the History of Science**

1990, vol. 23

"Lectures on Natural Philosophy in London, 1750-1765: S. C. T. Demainbray (1710-1782) and the 'Inattention' of his Countrymen," *A. Q. Morton*, 411-434. "The Case of Brownian Motion," *Robert Maiocchi*, 257-283.

"Delaroché and Bérard and experimental Error," *Eric Mendoza*, 285-292.

1991, vol. 24

"Newton's two 'Moon-tests,'" *N. Kollerstrom*, 369-372.

#### **Bulletin of Atomic Scientists**

1990, vol. 46

"Sakharov's H-Bomb," *Hans Bethe*, 8-10.

#### **Bulletin of the History of Chemistry**

1990, vol. 6

"Kasimir Fajans (1887-1975): The Man and his Work," *Reynold E. Holmen*, 7-14.

#### **European Journal of Physics**

1990, vol. 11

"The Rabi School," *Norman F. Ramsey*, 137-141.

"Time and History: The Humanistic Significance of Science," *M. Heller*, 203-207.

#### **Foundations of Physics**

1990, vol. 20

Three issues of this journal are devoted to invited papers dedicated to John Stewart Bell.

#### **Historical Studies in the Physical and Biological Sciences**

1990, vol. 21

"Profit and Loss: The Military and MIT in the Post-war Era," *Stuart Leslie*, 59-85.

"Spontaneous Breakdown of Symmetry: Its Rediscovery and Integration into Quantum Field Theory," *Laurie M. Brown* and *Tian Yu Cao*, 211-236. "Statistics and Combinatorics in early Quantum Theory II: Early Symptoms of Indistinguishability and Holism," *Olivier Darigol*, 237-298. "The Rockefeller Foundation, the Leipzig Geophysical Inst., and National Socialism in the 1930s," *Gregory A. Good*, 299-316. "Another Kind of Light: The Work of T. J. Seebeck and his Collaboration with Goethe, Part 2," *Keld Nielsen*, 317-398.

1991, vol. 22

"On the Chemo-thermal Origins of Special Relativity," *Seiya Abiko*, 1-24. "Prior History and Aftereffects: Hysteresis and Nachwirkung in 19th-century Physics," *Matthias Dörries*, 25-56.

"The Contributions of Bologna to Galvanism," *John Heilbron*, 57-86. "Piotr Kapitza and Stalin's Government: A Study in moral Choice," *Aleksei Kozhevnikov*, 131-164. "The Discovery of Cosmic Rays: Rivalries and Controversies between Europe and the United States," *M. de Maria*, *M. G. Ianniello* and *A. Russo*, 165-192.

#### **Isis**

1991, vol. 82

"Torricelli's Infinitely long Solid and its Philosophical Reception in the Seventeenth Century," *Paolo Mancuso* and *Ennio Vailati*, 50-70.

"Foreign Journals in the History of Science," In the June issue a group of historians survey the major European, Australian, Japanese and Latin-American

journals in the intellectual, social and cultural history of the sciences.

September

"The Adaptation of Babylonian Methods in Greek Numerical Astronomy," *Alexander Jones*, 441-453. "In lode della filosofessa di Bologna": An Introduction to Laura Bassi," *Alberto Elena*, 510-518. Laura Bassi was an important figure in eighteenth-century experimental physics in Bologna.

#### **Journal for the History of Ideas**

1990 vol. 51

"Tycho Brahe's Criticism of Copernicus and the Copernican System," *A. Blair*, 355-378.

#### **Methodology and Science**

1989, vol. 22

"More on Mach and Einstein: Investigation of an Important Phase in the Rise of Logical Positivism/Empiricism," *Gerald Holton*, 67-80.

1991 vol. 23

"Dirac and the Aesthetic Evaluation of Theories," *James W. McAllister*, 87-102.

#### **NTM-Scriftenreihe für Geschichte der Naturwissenschaften, Technik und Medizin**

1990, vol. 27

"Rezeption und Bewertung des Newtonschen Gravitationsgesetzes in Physiklehrbüchern im Zeitalter der Aufklärung in Deutschland," *Martin Lorenz*. "Die Bedeutung von 'Quantum in se est' in Newton's *Principia*," *Volkmar Schiller*, 11-23.

#### **Nuclear Physics A**

1990

The first issue in the volume is devoted to a Festschrift for Torleif Ericson. Foreword by Victor Weisskopf.

#### **Physics Today**

1991, vol. 44, November.

"Taylor-Couette Flow, the Early Days," *Russell J. Donnelly*, 32-39.

#### **Recherche**

1990, vol. 21

"Erwin Schrödinger: A Philosopher among Physicists," *M. Bithol*, 1392.

#### **Rivista Mexicana de Astronomia y astrofisica**

1990, vol. 21

"Chilean Astronomers and the Birth of Cerro-Tololo," *H. Moneno*, 683-687.

#### **Technology and Culture**

1989, vol. 30

"Nuclear Power and the Environment: The AEC and Thermal Pollution, 1965-1971," *Samuel J. Walker*, 964-992.

## SUMMARIES

Authors of books and articles on the history of physics are invited to send summaries for publication in this section. Maximum length: 75 words for articles, 150 words for books. Publication will be expedited if each summary is typed, on a separate sheet, in the format of the summaries below. Summaries should be sent to Elizabeth Garber, History Dept., SUNY at Stony Brook, Stony Brook, NY 11794.

## PLANETARY ASTRONOMY

**Michael J. Crowe** *Theories of the World from Antiquity to the Copernican Revolution*, 229 pp., New York: Dover Publications, 1990.

This survey of planetary astronomy from antiquity to 1615 aims to recreate the dramatic developments entailed in the shift from a geocentric to a heliocentric conception of the planetary system. Employing elementary mathematics, 119 illustrations, and selections from the writings of such authors as Ptolemy, Copernicus and Galileo, this book traces the debate over the place of our world in the cosmos. The book is centered on the question: given the evidence available in 1615, which planetary system—the Ptolemaic, Copernican, or Tychoic—most deserved the support of the scientific community at that time. An epilogue contains dozens of quotations from such authors as Luther, Donne, Shakespeare, Pascal, Milton, Pope, Kant and Polyani suggesting the larger significance of the Copernican revolution. An appendix, centered on Stonehenge, provides an introduction to archaeoastronomy. Bibliography and Index.

## JEREMIAH HORROCKS

**Allan Chapman** *Jeremiah Horrocks, the Transit of Venus, and the "New Astronomy" in early seventeenth-century England*, *Quarterly Journal of the Royal Astronomical Society*, 1990, 31: 333-357.

To mark the 350th anniversary of the 1639 transit of Venus, Horrocks is discussed as an early exponent of the astronomical revolution in England. The deeply physical character of his approach to astronomy is examined, with particular reference to his instrumentation. Horrocks used the telescope to ascertain comparative planetary sizes and to related them to Keplerian theoretical criteria. It is also demonstrated that the title "Reverend" was never attributed to Horrocks before the nineteenth century,

## INSTRUMENTS AND ASTRONOMICAL PROGRESS

**Allan Chapman** *Dividing the Circle: The Development of Critical Angular Measurement in Astronomy, 1500-1800*, 209 pps, 36 plates, Chichester, UK: Ellis Horwood/ New York, Simon and Schuster, 1990.

Progress in astronomy has always been closely related to the quality of graduated instruments. Available technology invariably created a barrier or "ceiling of accuracy" beyond which theory could not reliably proceed. Tycho Brahe's innovations were crucial, but it was the 17th-century invention of the pendulum clock, telescopic sight and the micrometer which vastly increased measurement potential and made it possible to both establish and confirm the operation of Newtonian gravitation as a physical phenomenon.

## GEORGE GRAHAM

**Allan Chapman** *George Graham and the Concept of Standard Accuracies in Instrumentation*, *Bulletin of the Scientific Instrument Society*, 1990, 27: 3-8.

While a clockmaker by trade, Graham was the first scientist to investigate the parameters of mathematical instrument accuracy in physical terms. His study of the effect of heat on metals led to fundamental horological innovations. Re-equipping the Royal Observatory for Halley in the 1720s he devised instruments with cross-checking and compensating parts. His instruments were fundamental to the discovery of the Aberration, Nutation and Meridional Degree length. Understanding the astronomer's problems, he made the instruments a philosophical device.

## COULOMB'S PRECISION MEASUREMENTS

**Stewart C. Gillmor**, *Coulomb and the Idea of Precision Measurement in Electricity*, abstract in *Bulletin d'histoire*

de l'électricité No. 14-15, Déc. 1989-Juin 1990, 226-227. Paper published in full in *Actes du Deuxième colloque international d'histoire de l'électricité*, Paris: 1991, 27-32.

Charles Augustin Coulomb's (1736-1806) development of precision instruments and instrumental methods affected the development of electricity, magnetism and physics as a whole. New instruments control the direction as well as the rate of growth of new scientific fields. Coulomb joined rational analysis, engineering techniques and natural philosophy in forging a new physics he passed to others who constructed the classical physics of the nineteenth century.

## PRESSURE &amp; VOLUME INDICATOR

**Davis Baird** *Instruments on the Cusp of Science and Technology: The Indicator Diagram*, *Knowledge and Society: Studies in the Sociology of Science Past and Present*, 1989, 8: 107-122.

During the 1790s James Watt and his assistant John Southern invented the Indicator Diagram, an instrument which produces a simultaneous trace of the pressure and volume inside the working cylinder of a steam engine. The Indicator was developed within the context of the theory of a substantial latent and sensible heat or caloric. Furthermore, not until well into the 1800s were the concepts of force, energy and work settled. Nonetheless, the Indicator provided an important source of information for improving the steam engine. More fundamentally, however, the stable repetitive phenomenon of an Indicator tracing out the pressure-volume changes during successive cycles of a steam engine provided an empirical foundation for E. Clapeyron's 1834 and R. Clausius's 1850 seminal contributions to thermodynamics. The article presents a history of the theoretical context within which the operation of the Indicator was seen. Author's address: Davis Baird, Department of Philosophy, University of South Carolina, Columbia SC, 29208. Reprints available.

### 1785-1795 SCIENCE AND POLITICS

**Seymour L. Chapin** *The Vicissitudes of a Scientific Institution: A Decade of Change at the Paris Observatory*, *Journal for the History of Astronomy*, 1990, 21: 235-274.

Originally an adjunct of the Academy of Sciences in Paris, the Royal Observatory gained its autonomy by a reorganization implemented in 1785. The French Revolution subjected its new regime to several stresses culminating in another reorganization in 1793. That was replaced, in its turn, by the creation of the Bureau de Longitudes in 1795. Except for the middle alteration, the changes enhanced the institution's ability to contribute to astronomy.

### VOLTA

**Giuliano Pancaldi** *Electricity and Life: Volta's Path to the Battery*, *Historical Studies in the Physical and Biological Sciences*, 1990, 21: 123-160.

The paper offers a new reconstruction of the discovery of the electric battery. Among the materials used are unpublished laboratory notebooks. Hints for the construction of the battery were suggested to Volta by an article written by William Nicholson. It dealt with the best way of imitating the shock and anatomy of the electric fish. Dissenting from Nicholson's scheme on some basic issues, Volta managed to replace Nicholson's ideal machine with a working apparatus.

### NINETEENTH-CENTURY PHYSICS

**David Cahan** *From Dust Figures to the Kinetic Theory of Gases: August Kundt and the Changing Nature of Experimental Physics in the 1860s and 1870s*, *Annals of Science*, 1990, 47: 151-172.

This essay seeks to illuminate the changing nature of experimental physics in the 1860s and 1870s by analyzing the creation of dust tubes and dust figures by the German experimentalist August Kundt, and by showing how Kundt and his associate Emil Warburg used the 'Kundt Tube' to test the new kinetic theory of gases. In so doing the essay seeks to show how Kundt came to revise the vision of experimental physics he had learned from his teacher Heinrich Gustav Magnus, a vision in which the experimentalist's goal was

to establish 'the facts.' Kundt, by contrast, came to envision experimental physics as being in the service of theory; to confirm or disconfirm theory or to provide theorists with new phenomena to theorize about. Kundt's vision, it is argued, is emblematic of the rise of the new subdisciplines of theoretical and experimental physics.

### LORENZ & OPTICAL THEORY

**Helge Kragh** *Ludvig V. Lorenz and his Contributions to Light Scattering*, *Proceedings of the Second International Congress on Optical Particle Sizing*, Phoenix, 1990, 1-6.

The Danish physicist Ludvig Lorenz (1829-1891) contributed to optical theory in works between 1860 and 1890. After a brief biographical sketch his two main contributions are discussed, the theory of refraction (including the 'Lorenz-Lorentz formula') and the theory of the scattering of plane waves by spheres. The latter work led Lorenz to the first optical determination of Avogadro's number and is today regarded as a classic of optical particle sizing theory.

### MICHELSON-MORLEY EXPERIMENT

**Stanley Goldberg** *What Instruments Measure and what People Believe: Reflections on the Impact of the Michelson-Morley Experiment*, in *The Age of Michelson in American Science, 1870-1930* Stanley Goldberg and Roger Stuewer editors. New York: American Institute of Physics, 1988, 78-95.

Contrary to the claims in most physics textbooks, the Michelson-Morley experiment does not demonstrate that the speed of light is invariant or even that it has the same speed in all directions in any particular frame of reference. No experiment can do that. At best, the apparatus compares the average speed in different directions. As Einstein recognized, commitment to the invariance of the speed of light is a stipulation that one must make in order to initiate the measuring process. Such assumptions necessarily lurk behind every measurement and are the essence of scientific work.

### PHILOSOPHY OF SCIENCE IN NINETEENTH-CENTURY

**Menachem Fisch** *William Whewell, Philosopher of Science*, 220pp., Oxford, Clarendon Press, 1991.

William Whewell was one of the most prolific and influential writers of early Victorian England. The *History* (1837) and the *Philosophy of the Inductive Sciences* (1840) form the cornerstone of his intellectual undertaking. They present for the first time a comprehensive history of the sciences, and, based upon that a systematic theory and methodology of the sciences, designed explicitly to counter Francis Bacon's still influential *Novum Organon*. This study reconstructs the formation of Whewell's two works, and to evaluate their philosophical claims. During the 1810s Whewell, as a member of the Analytical Society accepted Bacon's philosophy and Lagrange's formalistic version of the calculus. He awoke to the problems of maintaining this Baconian-Lagrangian view of maintaining mathematical physics in writing his texts of the next two decades. His own epistemology and methodology, both anti-Baconian and anti-Lagrangian was the only one to rise to the challenge of mathematical physics and to establish a theory of science very akin to the new theories of emergence offered by his contemporaries Lyell and Darwin.

### DUHEM

**Michael Crowe** *Duhem and the History and Philosophy of Mathematics*, *Synthese*, 1990, 83: 431-447.

This paper, presented at the Virginia Polytechnic conference on Pierre Duhem, discusses Duhem's views, as presented chiefly in his *Aim and Structure of Physical Theory*, of the philosophy and historiography of mathematics. The suggestion is made that although these views are problematic, various central claims made by Duhem regarding the methodology of physics can be applied with equal effectiveness to mathematics.

### WOMEN IN SCIENCE

**Peggy Aldrich Kidwell** *Three Women of American Astronomy*, *American Scientist*, 1990, 78: 244-251.

A brief account of the careers of Maria Mitchell, Annie Jump Cannon, and Cecilia Payne-Gaposchkin, three women who achieved distinction in a male-dominated science. Author's address, Room 5128, National Museum of American History, Smithsonian Institution, Washington, D.C., 20560. Reprints available.

### HUBBLE'S MANUSCRIPT

**Norriss S. Hetherington** editor *The Edwin Hubble Papers* Previously unpublished manuscripts on the extragalactic Nature of Spiral Nebulae, edited, annotated with an historical introduction, 250 pp., Tuscon AR: Pachart Publishing House, 1990.

The centuries-long debate over whether spiral nebulae are independent galaxies culminated in the 1920s in a dramatic conflict between Edwin Hubble and Adriaan van Maanen, colleagues at the Mount Wilson Observatory. Hubble devoted considerable effort to resolving the conflict between two sets of data. Extant are nine manuscripts, including a brief note on a technical matter, notes for a talk at a Mount Wilson seminar, and seven manuscripts apparently prepared for publication but withheld because of their controversial nature. The inevitable conclusion that van Maanen read his expectations into his data would, in the context of contemporary scientific mores, have humiliated him. With the deaths of the protagonists, there is less reason to suppress the manuscripts, and they are of interest for scientific, historical, philosophical and sociological issues.

### HUBBLE'S COSMOLOGY

**Norriss S. Hetherington** *Hubble's Cosmology*, American Scientist, 1990, 78: 142-151.

Edwin Hubble demonstrated the existence of galaxies and the expansion of the universe. He searched for variable stars in spiral nebulae, found them, used them as distance indicators and presented his results persuasively. He combined the distances with radial velocities to establish an empirical velocity-distance relation. Philosophical values led him to interpret the relation in terms of a relativistic, expanding homogeneous universe, while his data better agreed with a non-expanding cosmological model. Hubble is part of a long tradition of scientists refusing to accept falsification of their theories by contrary evidence. Author's address: Office for the History of Science and Technology, University of California at Berkeley, CA 94720. Reprints available.

### RIGHT'S MAGNETIC RAYS

**Bruno Carazzi and Helge Kragh** *Augusto Righi's Magnetic Rays: A Failed Research Program in early twentieth-century Physics*, Historical Studies in

the Physical and Biological Sciences, 1990, 21: 1-28.

Studies of electrical discharges in magnetic fields led some researchers to hypothesize the existence of a new type of cathode ray. In 1908 Augusto Righi proposed that these rays were electrical doublets of electrons and ions, and argued experimentally that he had identified a new state of matter. The claim received wide support among Italian physicists, but was met with scepticism in other countries. The resulting controversy, including its effects on Righi's nomination as a Nobel Prize candidate, is discussed in detail. The controversy died out about 1918, but Righi never retracted his claim. Reprints available from B. Carazzi, Department of Physics, University of Parma, 43100 Parma, Italy

### EINSTEIN AND QUANTUM MECHANICS

**Robert J. Deltete and Reed A. Guy**, *Einstein's Opposition to the Quantum Theory*, American Journal of Physics, 1990, 58: 673-683.

Einstein regarded the quantum theory as not only incomplete, but as fundamentally inadequate. He believed that the only reasonable interpretation of the quantum formalism was an 'ensemble interpretation,' but he also thought that this interpretation was incomplete and irremediably inadequate, because it failed to describe the objective, real states of individual systems. He hoped that a better theory would be developed—one expressed in terms of individuals having their own real states and from which quantum theory could be recovered as an approximation. Reprints available from Reed Guy, Department of Physics, Seattle University, Seattle WA, 98122.

### NUCLEAR FISSION

**J. W. Behrens and A. D. Carlson** editors *Fifty Years of Nuclear Fission*, Proceedings of a commemorative conference, Lagrange Park II: American Nuclear Society, 1989

A conference that celebrated the fiftieth anniversary of the discovery of nuclear fission was held at the National Institute of Standards and Technology and the National Academy of Sciences, April 25-28th, 1989. The meeting brought together pioneers of the nuclear fission field and other scientists and engineers to report on reminiscences of the past and

also the more recent developments in fission science. Contributors included E. Amaldi, L. Cook, G. Flerov, S. Fluegge, B. Goldschmidt, P. Kuroda, R. Peierls, P. Slavič, G. Seaborg, E. Segré, E. Teller, A. Weinberg, J. Wheeler and W. Zinn.

### AUSTRALIAN PHYSICAL SCIENCES

**R. W. Home**, *Physics in Australia to 1945: Bibliography and Biographical Register*, 222pp., Melbourne: distributed by D. W. Thorpe, 1990.

A listing of all Australian publications in physics and related subjects to 1945, classified by author and including a brief biographical summary for each author listed. There is a nine page introduction and subject index.

### RADIO & IONOSPHERIC PHYSICS

**C. Stewart Gillmor**, *Ionospheric and Radio Physics in Australian Science since the early Days*, in R. W. Home and S. G. Kohlstedt editors, *International Science and National Scientific Identity*, Kluwer Academic, 1991, 181-204.

Commerce, civil governments and the military have constantly and from the beginning, in Australia as elsewhere, kept interest in and supported radio and ionospheric physics. Based upon oral interviews, archival research and survey data, this article discusses the history in Australia of commercial radio, university and government research in ionospheric physics and developments in radar and radio astronomy from World War I until the 1970s. Australia's ties to Britain, its increasing ties to the United States, and its own creativity and innovation are examined.

### JAPAN'S ATOMIC BOMB PROJECT

**Morris F. Low**, *Japan's Secret War? "Instant" Scientific Manpower and Japan's World War II Atomic Bomb Project*, Annals of Science, 1990, 47: 347-360.

This paper looks at the wartime mobilization of Japanese scientists, outlines the World War II Japanese atomic bomb project, examines claims that Japan succeeded in completing an atomic weapon and concludes with a look at the ramifications of the historiography. Historical evidence suggests that the lack of scientific expertise in nuclear physics, as well as the reluctance of qualified scientists to become involved, severely hampered the development of an atomic bomb.

### DEVELOPMENT OF PHYSICS IN AUSTRALIA AND JAPAN

**R. W. Home and Masao Watanabe** *Forming new Physics Communities: Australia and Japan, 1914-1950*, *Annals of Science*, 1990, 47: 317-345.

In 1914, the discipline of physics had reached very similar stages of development in Australia and Japan. A generation later the paths of development had diverged considerably. A systematic comparison of the evolution of physics in the two countries during these years identifies factors—political, economic and cultural—that led to this divergence, but it also uncovers a number of underlying parallels. Authors addresses: R. W. Home, Department of the History and Philosophy of Science, University of Melbourne, Parkville, Victoria 3052, Australia, and M. Watanabe, Programme in the History of Science, International Christian University, 10-2 Osawa 3-chome, Mitaka-shi, Tokyo 181, Japan. Reprints available from either author.

### IMPORTANCE OF THE CYCLOTRON

**Davis Baird and T. Faust** *Scientific Instruments, Scientific Progress and the Cyclotron*, *British Journal for the Philosophy of Science*, 1990, 14: 147-175.

Studying the cyclotron between 1929 and 1940, we urge a conception of scientific knowledge which includes the production of new instruments and techniques. We focus on three details in the development of the cyclotron: producing the ions, focussing the ion beam, and creating and maintaining the vacuum. We describe eight components central to the success of the cyclotron; (i) experimental idea (ii) theoretical test (iii) empirical test (iv) functional design (v) intuition (vi) tinkering (vii) adapting components from other sources (viii) knowing when the instrument is working. We argue that the process of instrument creation proceeds by emulation and adaptation of previously successful instruments and techniques. This explains why instrument creation proceeds from a relatively simple guiding idea through a plethora of engineering and scientific complexities. The result is the accumulation of new scientific instruments and instrumental techniques—scientific progress. Reprints available from Davis Baird, Department of Philosophy, University of South Carolina, Columbia, SC 29208.

### HEISENBERG AND NUCLEAR POLICY IN FRG

**Michael Eckert** *Primacy doomed to failure: Heisenberg's role as scientific advisor for nuclear policy in the FRG*, *Historical Studies in the Physical and Biological Sciences*, 1990, 21: 29-58.

During the first decade after World War II, Werner Heisenberg, the doyen of German nuclear physicists, displayed ambitious pretensions to become his nation's exclusive leader of science and advisor for nuclear policy. His efforts were welcome as long as his renown served to win sympathies in the international arena, but proved unavailing when the advisory function in question was technocratic rather than representative. Author's address, Michael Eckert, Chopinstrasse 32, D-8000 Munich 60, Germany. Reprints available.

### GOVERNMENT FUNDING AND U. S. SCIENCE

**Chandra M. Mukerji** *A Fragile Power: Scientists and the State*, 253 pp., Princeton, NJ, Princeton University Press, 1989.

Through grants and contracts the United States government has maintained since World War II a highly skilled labor force of scientists with the expertise to solve a wide range of scientific and technical problems. Contemporary scientists and science policy experts tend not to see this, working instead on the assumption that government uses and needs scientific information. On the other hand, scientists develop skills in doing their research that make them valuable experts that the government could not maintain in its own offices. They are frequently called upon as consultants in a variety of capacities from designing weapons systems to evaluating new research techniques. Scientists readily give to the government their expert skills that they undervalue, in the process exchanging with the state for research funds, the political and technical usefulness of scientific expertise.

### THE ONR

**Harvey M. Sapolsky**, *Science and the Navy: The History of the Office of Naval Research*, 142 pp., Princeton NJ, Princeton University Press, 1990

The Office of Naval Research (ONR) is the agency that has had the greatest influence over federal government policy toward academic science in the post World War II period. This vol-

ume examines the origins of ONR and its role in guiding federal science policy. The basic argument is that ONR was a bureaucratic accident and that its policy role was never accepted by the Navy as worthwhile or legitimate. Of special interest are ONR's relationships within the Navy, with other government agencies including the Atomic Energy Commission and the National Science Foundation, and with the universities. Support of physics is discussed along with other central issues in government support of research.

### RESTRUCTURING OF PHYSICS AFTER WORLD WAR II

The following papers all appear in the proceedings of an international conference in Rome, September 1988, **Michelangelo de Maria, Mario Grilli and Fabio Sebastini** editors *The Restructuring of the Physical Sciences in Europe and the United States, 1945-1960*, World Scientific, River Edge, NJ, 1989.

### WAR RESEARCH STYLE

**Lillian Hoddeson** *The Los Alamos Implosion program in World War II: A Model for postwar American Research*, p. 31. (Rome 1988 conference-see above)

The paper studies how the Los Alamos implosion program between April 1943 and July 1945 helped to solidify a trend emergent in America in the 1930s to do research in a new way, with experiment and theory in intimate contact, and scientists and engineers, metallurgists and craftsmen working closely together. This approach has become an important part of the present American research style that characterizes a major sector of government supported "big science."

### GOUDSMIT

**Stanley Goldberg** *Between Old and New: Goudsmit at Brookhaven*, (Rome 1988 conference-see above)

Sam Goudsmit was a physicist who loved detective work. In World War II, he successfully maneuvered his own appointment as head of project ALSOS with the prime mission of documenting German work in nuclear technology. After the war, Goudsmit's known activities included chairing the Physics Department at Brookhaven National Laboratory and inventing a new kind of publication: *Physical Review Letters*. What is not generally known is that until his death in 1974, he remained an active



member of the U. S. intelligence community working with, among others, the AEC, the CIA and the Air Force Technical Intelligence Committee (AFTIC).

#### ROCKET BORNE RESEARCH

**David H. DeVorkin** *Along for the Ride: The Response of American Astronomers to the Possibility of Space Research, 1945-1960, 55-74.* (Rome 1988 conference-see above)

At the end of World War II a number of prominent American astronomers became enthusiastic about preparing scientific instruments for flights on captured German V-2 rockets, and made plans to build spectrographs to capture the ultraviolet spectrum of the sun beyond the spectral cutoff of the earth's atmosphere. None were successful in the effort, and none stayed with the interest for more than a few years. Just why this was so illustrates the marginality of rocket-borne research to the established physical sciences, and highlights how the nascent space sciences emerged out of a military-based instrument-building culture. This paper is part of a larger study that includes cosmic-ray physics: *Science with a Vengeance: The Military Origins of the Space Sciences in the V-2 Era*, (Springer, forthcoming).

#### IONOSPHERIC PHYSICS

**C. Stewart Gillmor** *Geospace and its Uses: The Restructuring of Ionospheric Physics following World War II, 75-84.* (Rome 1988 conference-see above)

The physics of the ionosphere has been studied since the beginning years of this century, but was effectively established as a discipline in the 1920s. The greatest changes in Ionospheric Physics came about in the period 1945 to 1960. This article sketches the history through the 1970s, supported by reference to sociometric and survey data concerning the literature growth, citation and funding studies, intellectual problem choice and physical migration of researchers.

#### CORNELL SYNCHROTRONS

**Albert Silverman** *Birth of Electron Synchrotrons at Cornell*, (Rome 1988 conference-see above)

The Floyd R. Newman Laboratory of Nuclear Studies at Cornell University is one of four high energy laborato-

ries in the United States. It has been in the forefront of accelerator development and particle research since its founding in 1946. This paper describes the founding of the laboratory, and the accelerators that were built and the research program from 1946-1960. In concluding remarks the author speculates on the reasons why this small laboratory flourished in this quintessentially "large science" discipline.

#### LINDENBAUM'S EXPERIMENT

**S. J. Lindebaum** *Initial Experiments with the Nevis Cyclotron, the Brookhaven Cosmotron, and the AGS and their Effects on High Energy Physics, 502-516.* (Rome 1988 conference-see above)

Initial experiments at three accelerators by Lindebaum (and collaborators) led to the following: At the Nevis Cyclotron (1950-1951), cosmic rays were shown to be produced by a nucleon-nucleon cascade demonstrating the superiority of accelerator versus cosmic-ray investigations: At the Brookhaven Cosmotron (1952-1959) he demonstrated low energy pion-nucleon scattering and pion production to be mostly due to excitation of a nucleon isobaric state with  $T = J = 3/2$  contradicting the Fermi statistical theory and leading to the isobar model he proposed. At the AGS (1961-1962) Lindebaum (and collaborators) demonstrated that "Asymptopia" would not be reached before several hundred GEV and first developed the on-line computer technique which is now the almost universal. Author's address: Physics Department, Brookhaven National Laboratory, Upton, NY 11973. Reprints available.

#### S-MATRIX

**James T. Cushing** *Theory Construction and Selection in Modern Physics: The S Matrix, 409 pp.*, Cambridge, Cambridge University Press, 1990.

One of the major philosophical problems in the physical sciences is what criteria should determine how scientific theories are selected and justified in practice and whether, in describing observable physical phenomena, such theories are effectively constrained to be unique. The book studies the example of a particular theory, the S-Matrix program.

The S-Matrix program was initiated by Heisenberg to deal with difficulties encountered by quantum field theories in describing physical phenomena. Since then each theory has, at different times, been favored as the explanation of observed phenomena. Certainly the S-Matrix theory was adequate, feasible and fertile. However, quantum field theory is now widely accepted and the study of alternative theories is all but abandoned. By examining the philosophy that influenced the turns in this story, the author explains how an adequate and viable theory fell out of favor and concludes with a critique of different methodologies in the history of science.

#### QUANTUM MECHANICS

**Jeremy Bernstein**, *Quantum Profiles*. Princeton, Princeton University Press, 1991.

The author, both a professional physicist and a writer, evokes the quantum mechanical world through three scientific profiles. The longest is of the late John Bell, whose search for clarity in the foundations of the quantum theory, and Irish wit, brought interest back to this subject. The second profile is of John Wheeler who learned the theory when both he, and it, were young. There is a profile of Michele Besso, Einstein's closest friend who was a sounding board for Einstein's ideas in physics. Together, the three profiles illuminate both the joys and agonies of the theory.

#### BOHR & EINSTEIN

**Mendel Sachs**, *Einstein Versus Bohr: The Continuing Controversies in Physics*. LaSalle, IL, Open Court Publishing Co., 1988.

This book highlights the conceptual differences and debates in contemporary physics between the nondeterministic/probabilistic attitude of the Copenhagen School, led by Niels Bohr, and the deterministic/continuous field view, led by Albert Einstein. The ideas on both sides of the debate are traced from the classical period of Galileo and Newton to the conflicting views of atomism versus continuity in nineteenth-century physics to the simultaneous appearance of the conflicting revolutions in twentieth-century physics—the quantum and relativity theories.

## DIVISION ELECTION

### Nominees for the 1992 Divisional Election

We need to elect a Vice-Chairperson who will become Chairperson next year, and two members of the Executive Committee who will serve for three years.

### For Vice-Chairperson

#### James T. Cushing

James Cushing is Professor of Physics and Professor of Philosophy at the University of Notre Dame. After receiving his Ph.D. from the University of Iowa in theoretical physics in 1963, he spent two years as a National Science Foundation Postdoctoral Fellow at Imperial College (London) prior to joining the faculty at the University of Notre Dame in 1966. The first half of his professional research career was spent working in high-energy theoretical physics and in mathematical physics. Cushing is the author of *Applied Analytical Mathematics for Physical Scientists* (John Wiley & Sons, 1975). For the last dozen years, his research interests have shifted to the history and philosophy of modern physics and to foundational problems in quantum mechanics. Among his books in this area are *Philosophical Consequences of Quantum Mechanics* (with Ernan McMullin) (University of Notre Dame Press, 1989) and *Theory Construction and Selection in Modern Physics: The S Matrix* (Cambridge University Press, 1990). In recent years Professor Cushing has been a Visiting Fellow at the London School of Economics and at the University of Cambridge. He has served on the AAPT Committee on the History and Philosophy of Science, the Program Committee of the APS, the Nominating Committee of the History of Physics Division of the APS and is currently a lecturer in the AIP Visiting Scientist Program.

#### Silvan S. Schweber

Silvan S. Schweber received his Ph.D. in theoretical physics from Princeton in 1952. Upon the completion of a two year postdoctoral fellow-

ship at Cornell he joined the faculty of Brandeis University, where he has been ever since and where he is a Professor of Physics and the Koret Professor of the History of Ideas. Since the late seventies his research has been in the history of science. He has written extensively on 19th century evolutionary and probabilistic thought and on the history of 20th century physics and has completed a history of quantum electrodynamics from 1927 to 1950. He is presently at work on a biography of Hans Bethe. How to build bridges between physical scientists and historians, philosophers and sociologists of science and how to introduce graduate students in the physical sciences to the history of their discipline during the twentieth century has been a matter of great concern to him.

### For Executive Committee

#### David C. Cassidy

Historical interests: history of modern physics and physics in Germany; the social responsibility of the scientist/physicist; Heisenberg; Einstein. Educational interests: history of physics for science students, and physical science for non-science students. Current positions: Associate Professor, Natural Science Program, Hofstra University, Hempstead, NY, and Adjunct Associate Professor, History Department, SUNY Stony Brook. Past positions: Associate editor, Albert Einstein Papers, in Boston and Princeton; Assistant Professor, History of Science, University of Regensburg, Germany; Alexander von Humboldt fellow, History of Science, University of Stuttgart, Germany; Research fellow, Office for history of Science and Technology, University of California, Berkeley. Education: BA and MS, Physics, Rutgers; PhD 1976, Department of Physics, Purdue, in conjunction with Department of History of Science, University of Wisconsin, Madison. Main Publications: *Uncertainty: The Life and Science of Werner Heisenberg* (NY: Freeman, 1991); Assoc. Ed., *Collected Papers of Albert Einstein*, vols, 1 and 2; articles and essays on various topics in history of physics from 1700 to present in HSPS and elsewhere. Current Research: Physical Science under the US military occupation of Germany after World War II (NSF supported).

**Gloria B. Lubkin**

M.A., Physics, Boston University, 1957. *Physics Today*, Editor: Associate 1963-69, Senior 1970-84, Editor 1985-. Nieman Fellow, Harvard University, 1974-75. Professorship of Theoretical Physics established in her honor at the University of Minnesota, 1990. Fellow, American Physical Society, Executive Committee, History of Physics Division, 1983-86. Executive Committee, Forum on Physics and Society, 1977-78. Consultant, AIP Center for History of Physics, 1964-67. Interests: Oral history interviews with early leaders in nuclear physics. Nuclear Physics, especially energy levels of light nuclei; nuclear shielding studies. Helped to found the Theoretical Physics Institute at the University of Minnesota, which now has six permanent members. Regularly publishes history articles in *Physics Today*. Organized special issues on Niels Bohr, Richard Feynman, Andrei Sakharov and (to be published in April) John Bardeen.

**Peggy Aldrich Kidwell**

Peggy Kidwell watches over the mathematics collections in the Smithsonian's National Museum of American History. She received her B.A. in physics from Grinnel College, and a PhD in history of science from Yale. Kidwell has published on topics ranging from the seventeenth century application of natural philosophy to horticulture to the twentieth century use of atomic theory to determine the chemical composition of the stars. Her most recent exhibit was on the history of the metric system in America. She is presently intrigued by computing devices, particularly as they have been used by scientists. Having written several articles on specific objects, she is now working

with colleagues on two books relating to this subject. Kidwell is a member of the council of the History of Science Society and the executive committee of the Historical Astronomy Division of the American Astronomical Society.

**Allan A. Needell**

Allan A. Needell is Curator in the Space Science and Exploration Department of the Smithsonian Institution's National Air and Space Museum. He has published on the history of physics [most recently the introduction to the reprinting of Planck's *The Theory of Heat Radiation* (New York: American Institute of Physics, Tomash, 1989)], the origins of American national laboratories, and government/science relations. He is currently working on a biography of American science administrator, Lloyd V. Berkner. Needell joined the National Air and Space Museum in 1981, when he led the museum's efforts to commemorate the twenty-fifth anniversary of the beginning of space flight. He has been responsible for the planetary and geophysical sciences collections of artifacts and has assisted in curating the applications satellite and military satellite collections. From 1978-81, Needell served as associate historian at the Center for History of Physics, American Institute of Physics, where he had research and staff responsibilities for a three-year, federally funded project to investigate and recommend ways of improving the identification and preservation of records documenting the history of the U.S. Department of Energy's research laboratories. Needell was born in Peterson, New Jersey in 1950. He graduated (BA Physics) from Cornell University in 1972 and (PhD History of Science) Yale University in 1980.

\*\*\*\*\*

**1992 Ballot**

The Ballot must be returned before April 4th, 1992, to C. Stewart Gillmor, Department of History, Wesleyan University, Middletown CT 06459-0002.

**Vice-Chairperson--Vote for ONE**

- JAMES T. CUSHING  
 SILVAN S. SCHWEBER

**Executive Committee--Vote for TWO**

- DAVID C. CASSIDY  
 GLORIA B. LUBKIN  
 PEGGY A. KIDWELL  
 ALLAN A. NEEDELL

HISTORY OF PHYSICS NEWSLETTER  
Volume V Number 1 -- February 1992

DIVISION NEWS:	1
AIP & APS NEWS:	2-3
ANNOUNCEMENTS & REPORTS:	3-5
MEETINGS:	5-6
GRANTS & FELLOWSHIPS:	6-8
BOOK PUBLISHERS:	8-11
RECENT & FUTURE ARTICLES:	11-12
SUMMARIES:	13-17
DIVISION ELECTION NOMINEES	18-19
ELECTION BALLOT:	19

\*\*\*\*\*