

History of Physics Newsletter

Volume IV, Number 5

October 1991

DIVISION NEWS

APS INVITED SESSIONS

The Division of History of Physics will sponsor sessions of invited papers at the following APS meetings in 1992:

Indianapolis, Indiana, "Early Days of the Modern Theory of Solids: A Tribute to Fred Seitz." March 16th or 17th, 1992. The session is being organized by Lillian Hoddeson. David Pines will be chairperson. Speakers include: (titles are tentative) *Rudolph Peierls* "Early Work on Solids - Mainly in the 30's."

Lillian Hoddeson "The Quantum Theory of Solids Enters Academia and Industrial Laboratories."

Fred Seitz "The Princeton Years and Beyond."

Phil Anderson "When Did Dirty Solids Become Different from Clean Solids?"

Washington, DC, "The Birth of the Nuclear Age 50 Years Ago." April 23rd, 1992 is requested. This session is being organized by A. Wattenberg. Lawrence Badash will make some introductory remarks and will be chairperson. The speakers who played a role in the events at Chicago in 1942 include: *John Wheeler* from the Princeton group (Theory), *Volney C. Wilson* from the Chicago group (Instrumentation), *Ed Creutz* from the Princeton group (Physics and Metallurgy), and *Al Wattenberg* from the Columbia group (Experimental "Piles".)

Washington, DC, "Women in Astrophysics." April 22nd, 1992 is requested.

This session is sponsored by the Divisions of Astrophysics and of History of Physics and is being organized by C. Stewart Gillmor. Speakers include: *Peggy A. Kidwell*, *Dorritt Hoffleit*, *Nancy Roman*, and *France A. Cordova*.

RENEWAL OF DIVISION MEMBERSHIP

It is necessary to renew your membership in the subunits of the APS every year when you pay your dues to the APS. If you mistakenly failed to renew your membership in the Division of History of Physics, there is a **Form for Renewal of Membership in the Division of History of Physics on the back page of this Newsletter**. This year there is no charge for renewal of membership in this Division of the APS. If History does not become a Forum of the APS, in future years there probably will be a charge of \$5.00 dues the same as there is for membership in all other divisions of the APS.

NOMINATIONS FOR OFFICERS

The Chairperson of the Nominating Committee for the 1992 Divisional Election is Professor Gerald Holton, Jefferson Laboratory, Harvard University, Cambridge, MA 02138. The Nominating Committee would appreciate receiving suggestions for nominees who are willing to serve as Vice-chairperson (to become Chairperson in 1993) and for members of the Executive Committee whose terms are three years. Nominees must be members of the Division of History of Physics. Please send suggestions as soon as possible to Professor Gerald Holton.

DIVISION COMMITTEE MEMBERS

This year the members of the committees of the Division of History of Physics are:

1. Nominating Committee
 - Gerald Holton*
 - Laurie Brown
 - James Cushing
 - Albert Wattenberg
2. Program Committee
 - Martin Klein*
 - Clayton Gearhart
 - Lillian Hoddeson
3. Fellowship Committee
 - Allan Franklin*
 - Lawrence Badash
 - Elizabeth Garber

ELECTION RESULTS

Gerald Holton was elected vice-chairperson of the Division of History of Physics for 1991 and will serve as chairperson in 1992. He is Mallinckrodt Professor of Physics and Professor of History of Science at Harvard University. He received his Ph.D. in experimental high pressure physics as a student of P.W. Bridgman. His main current research is in the history of modern physics in which field he has contributed books, essays, and articles. He is former president of the History of Science Society.

C. Stewart Gillmor has been reelected as Secretary/Treasurer and will serve a three year term. He is Professor of History and Science at Wesleyan University, Middletown, CT. His major areas of research are in the history of science and engineering 1950 to the present, especially ionospheric and space physics. He was Editor of Transactions - American Geophysical Union and the History of Geophysics series.

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, Stony Brook, NY 11794.

John P. Blewett was elected to serve a three year term on the Executive Committee. He earned his doctorate at Princeton and spent a post-doctoral year at the Cavendish Laboratory then directed by Rutherford. For thirty years he was at Brookhaven National Laboratory where he worked on accelerator design and synchrotron radiation. He has been interested in the preservation of the historical records of physics.

Lillian Hoddeson was elected to serve a three year term on the Executive Committee. She is a Senior Research Physicist in the Physics Department and a Visiting Associate Professor in the Department of History at the University of Illinois. Since 1967, her main area of research has been in the history of physics specifically: solid state physics, accelerator physics and laboratories, and Los Alamos Laboratory. She has written, coauthored, or edited about half a dozen books.

EXECUTIVE COMMITTEE

The Executive Committee of the Division of History of Physics met in Washington, DC on April 23rd, 1991. Highlights of the reports and discussions are:

1) Chairperson Franklin introduced the APS Executive Secretary, Richard Werthamer, who was present to provide information on the implications for the Division of History of Physics of the changes in the APS Constitution and Bylaws which were approved by the membership January 1991. The Executive Committee discussed the pros and cons of changing the name from "History of Physics Division" to "Forum on the History of Physics." Dr. Werthamer explained the APS Council's feelings that the History of Physics is more like a Forum than a Division, but the Council is not pressing the Division to change its status. However, if History continues as a Division there will be a charge of \$5. per year for dues; whereas there is no dues charged to members of Forums. Therefore there is concern about the financial sup-

port for our activities. Considerable discussion took place and the Executive Committee is recommending to the general membership that it approve the change to the Forum on the History of Physics of the APS. The question of whether to change the name to "Forum" will be submitted to the membership in the Spring of 1992.

2a) The Divisional Councillor, Wattenberg, reported that the new Constitution and Bylaws require that we amend our Bylaws in several details. One is that all subunits of the APS must have a Chairperson-Elect as well as a Chairperson and Vice-Chairperson. Other changes are concerned with the terms and number of members of various committees, and the responsibilities of the officers and committee members. It was decided to appoint an ad hoc committee to prepare the necessary amendments to our Bylaws. The process then requires that the amended Bylaws be reviewed by the APS Committee on Constitution and Bylaws and approved by the APS Council before they are submitted to the general membership of the present division for their consideration. It is anticipated that the proposed amended Bylaws will be mailed to you during the spring of 1992 for your approval or rejection.

2b) The Councillor also reported that the Council of the APS has approved the previous request of the Executive Committee of the History of Physics that the University of Chicago Physics Centennial Conference be an APS "Sponsored Conference". It will be held December 1-2, 1992 at the University of Chicago and is open to the public.

3a) Secretary-Treasurer, Gillmor, reported on the desirability of increasing travel support for Executive Committee members to attend the annual meeting. He felt that some members, particularly those from the Western part of the US, were hampered in their ability to participate due to financial limitations. It was moved and seconded to increase the support by 50%.

3b) Gillmor reported on his attendance at APS headquarters on January 11th, 1991 for a meeting of APS Subunit officers. (For a summary of this meeting see the APS Bulletin, 36, 35, pp.1427-29 May 1991.)

CONTRIBUTED PAPERS AT APS MEETINGS

At the History Division's Executive Committee meetings, Chairperson Franklin urged the Division to have sessions of contributed papers at General Meetings of the APS as well as the sessions of invited papers. The rules concerning contributed papers are set by long tradition of the APS. Members of the APS can submit a single paper without review or approval and the time is limited to ten minutes. The abstract of a paper must arrive at the office of the Executive Secretary before the deadline date announced in the Bulletin of the APS. If there are a number of papers in a field, then the officers of the Division are involved in scheduling the papers. If you are submitting a contributed paper, we recommend that at the same

time as you send the paper to the APS headquarters that you also send a copy to the Chairperson of the Division. This year the Chairperson is Professor Martin Klein, Yale Station, Box 2036, New Haven, CT 06520.

APS & AIP NEWS

Joint Meetings with AAPT Changed -

Under the new Constitution and Bylaws of the APS all meetings and "Sponsored Conferences" require the approval of the APS Executive Board. The major change for us will be in the lead time for formal planning and obtaining Executive Board approval. The APS has decided that the January General Meeting of the APS will be discontinued. There are plans to have the joint meeting with the AAPT at the time as the Spring APS meeting. This will occur in Washington in April 1992.

Forum on Physics Education - A petition and Bylaws were submitted to the APS Council for the formation of a Forum on Physics Education. At its 1991 Washington meeting, the Council approved the formation of a Forum on Physics Education.

"Unity Day" - A special plenary session called, "Unity Day", with distinguished invited speakers representing a variety of subfields in physics, was instituted at the APS Spring Meetings in 1990 and 1991. It is hoped that the event will become an annual tradition to emphasize the unity of the physics enterprise. The tentative schedule for the next "Unity Day" is Wednesday afternoon, April 22nd, 1992 in Washington, DC.

John Bardeen Memorial Symposium - A special Commemorative Memorial Symposium is being organized by an ad hoc committee of the APS Executive Board. The session is being planned for the March 1992 Indianapolis meeting of the Division of Condensed Matter. The symposium is being organized by Charles Slichter.

The Spring 1991 issue of the **AIP History Newsletter** continues reports on new acquisitions by the various repositories in the U.S., Canada, Western Europe, and the Soviet Union. This section of the Newsletter of the Center for History of Physics is entitled "Documentation Preserved: Report from the International Catalog of Sources for History of Physics and Allied Sciences."

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) to the Friends of the Center for History of Physics.

ANNOUNCEMENTS & REPORTS

Dudley Observatory

The Board of Trustees of the Dudley Observatory announces that the eighth annual competition for the Herbert C. Pollock Award for research in the History of Astronomy and Astrophysics has been completed with the following result:

\$10,000 Pollock Award to Sara Schechner Genuth, Newberry Library for "Comets, Popular Culture, and the Rise of Modern Cosmology."

\$6,000 Dudley Award to Steven James Harris, Harvard University, for "Jesuit Observatories, 1700-1773: Forgotten Research Sites for 18th Century Astronomy and Meteorology."

\$4,000 Dudley Award to David H. DeVorkin, Smithsonian Institution National Air and Space Museum for "Henry Norris Russell and the Emergence of Modern Astrophysics in America."

The **Herbert C. Pollock Award** is for an innovative research project in the history of astronomy or astrophysics by a faculty member, research associate, or graduate student associated with an institution. Special consideration is given to proposals that involve the Dudley Collections. There are also lesser Dudley Awards as well as the Pollock Award. Interested applicants should let the Committee know whether they are otherwise supported; they should obtain information from the Pollock Awards Committee, Dudley Observatory, Schenectady, NY 12308. In previous years the deadline for applications has been December 15th.

European Physical Society forms History of Physics Group

The European Physical Society has decided to form an interdivisional group in the History of Physics with the aims of holding conferences on the history of physics, promoting the history of science in science teaching, and cataloguing the archives of collections of scientific instruments in Europe. More information can be obtained from Dr. Andrew Warwick, St. John's College, Cambridge, CB2 1TP, England.

HSS Dibner Visiting Historians of Science Program

The History of Science Society has named a fourth roster of Dibner Visiting Historians of Science to serve as visitors through 1992 and 1993. Those interested in arranging for visits to their campus by one of the Visiting Historians should write for more information about the program to the Executive Secretary of History of Science Society, Michael M. Sokal, 35 Dean Street, Worcester, MA 01609.

History of Science Prize, Third World Academy of Sciences

Competition for an award of \$10,000 is open to scholars from the Third World and elsewhere for the best unpublished research essay highlighting the work of a scientist from a country of the Third World prior to the twentieth century, whose scientific achievements were not previously recognized. Entries for the 1992 competition should be between 20,000 and 50,000 words; they should be submitted in English. The essay should indicate the scientist's contributions to his or her community and where relevant establish their influence on modern scientific thought. Essays should be received by the Executive Secretary of the Third World Academy of Science no later than March 1st, 1992. Submissions should be addressed to Helen Grant, History of Science Prize, Third World Academy of Sciences, c/o International Centre for Theoretical Physics, P.O. Box 586-Strada Costiera 11, 34136, Trieste, Italy.

International Summer School in the History of Science

The third International Summer School will be held July 13th to 24th, 1992 at the University of California at Berkeley. The theme is "the Natural Sciences and their Applications between the Two World Wars." Participation is limited to advanced graduate students and faculty familiar with the general area of study. Those selected to participate will receive free room and board in Berkeley during their attendance. Some support for travel expenses may be available. The school charges no fees and offers no degrees. Students can apply for either one or two weeks. For more information, write to John Heilbron, Office for History of Science and Technology, 470 Stephens Hall, University of California, Berkeley, CA 94720.

National Coordinating Committee for the Promotion of History (NCC)

The **Director's Report** of NCC provides information on legislative and administrative activities of the federal government. The Administration recommended a \$14 million increase for the National Archives for FY92. Money for basic operations remains fairly constant; the increases go mainly for increased rent for record storage, inflationary costs, and the moves to Archives II in College Park, Maryland, which is planned to take place in 1994. NCC considers the move to Archives II to be underfinanced. Also severely underfunded are programs for records description and for declassification; researchers are severely limited in their ability to study the past because large groups of records over 30 years old have not been declassified.

The Administration recommended level funding for the National Trust for Historic Preservation, a slight increase for the state historic preservation fund, and a 15% increase for the Smithsonian Institution. The director of the NCC is Dr. Page Putnam Miller, National Coordinating Committee for the Promotion of History, 400 A Street, SE, Washington, DC 20003.

Pfizer Prize Awarded to Crosbie Smith and Norton Wise

The History of Science Society has awarded the Pfizer Prize for the most outstanding book written by an American on the history of science published during the last three years. Smith and Wise received the award for their book "Energy and Empire: A Biographical Study of Lord Kelvin" published in 1989 by Cambridge Press.

The History of Science Society has decided that the Pfizer Prize will be open to all books on the history of science published in English during the past three years. More information is available from the current chair of the HSS' Committee on Honors and Prizes, Hamilton Cravens, 465 Myrtle Court, Benicia, CA 94510-1451.

Survey of Historians of Physics

Stephen Brush is conducting an international survey of historians of physics. Members of the History of Science Society who indicate "physics" as one of their subject interests in the HSS Guide will automatically be included. Others may request a survey form from S.G. Brush, IPST, University of Maryland, College Park, MD 20742, USA.

MEETINGS

The **AAAS 1992 Annual Meeting** is scheduled for February 6th to 11th, 1992 in Chicago at the Hyatt Regency Hotel. There are several sessions on Energy for the 21st Century; a few talks on Friday and Tuesday have an historical perspective. For further information write to AAAS, Meetings Office, 1333 H Street, NW, Washington, DC 20005 or telephone (202) 326-6448.

BSHS: Joint Anglo/North-American Meeting This joint meeting with the **History of Science Society** is being co-sponsored by the **Canadian Society for the History of Philosophy and Science**. It will take place in Toronto on July 26th-28th, 1992. The theme is "The History of Laboratories and Laboratory Sciences." The HSS Program Chair is Alan Rocke, Department of History, Case Western Reserve University, Cleveland, OH 44106.

III CLAHCT - Third Latin American Congress of History of Science and Technology is scheduled to be held in Mexico City from January 12th to 16th, 1992. The general theme: America in the Formation of a New World: 500 Years of Scientific Exchange. Contact: Comitè Organizador III CLAHCT, Apartado Postal 21-873, 04000 Mexico, D.F., Mexico.

Cornell University Symposium on Enrico Fermi is planned by the Department of Physics and Program on History and Philosophy of Science and Technology to celebrate Columbus day October 14, 1991. Speakers include: Harold Agnew, Hans Bethe, S. Chandrasekar, Richard Garwin, M.L. Goldberger, Jay Orear, Art Rosenfeld, Val Telegdi, Al Wattenberg, Nella Fermi Weiner, Jane Wilson, and Robert Wilson. Information on the symposium can be obtained from Jay Orear, Department of Physics, Newman Lab, Cornell University, Ithaca, NY 14853.

Hartlib Papers Project - A conference on "The Advancement of Learning in the Seventeenth Century" will take place at the University of Sheffield on July 6th-8th, 1992. It will be interdisciplinary and subjects covered will include the entire range of seventeenth century intellectual life. Offers of papers should be sent to HPP Conference, Hartlib Papers Project, University of Sheffield, Sheffield, S10 2TN England.

International Symposium on the History of Particle Physics will be held at the Stanford Linear Accelerator Center on June 24-27, 1992. Co-sponsored by SLAC and Fermilab, the meeting is organized around the central theme of the rise of the "Standard Model" of particle physics and forces in the period 1964-79. Physicists, historians of science, philosophers of science sociologists are on the program. The meeting chairpersons, Lillian Hoddeson and Michael Riordan, invite those interested in attending to contact: Nina Adelman Stolar, SLAC Public Affairs Office, Mail Stop 70, P.O. Box 4349, Stanford, CA 94309.

The **1992 Annual Meeting of HSS** will be in Washington, DC from December 26th to 30th, 1992. It will be a joint meeting with the American Historical Association. Further details may be obtained from Dr. M.M. Sokal, 35 Dean Street, Worcester, MA 01609.

The **Forum for the History of Science in America** met during the October 1990 meeting of the History of Science Society. Together with the History of Science Society it cosponsored a session on "Science in the Haunted Fifties." Among the papers presented were "Witch Hunting of Scientists," by Linus Pauling who spoke from notes; the talk will be transcribed and available. "Project Vista: Scientists and Nuclear Weapons," by David C. Elliot, copies of the talk are available from the author, 15 Dabney, California Institute of Technology, Pasadena, CA 91125. "Communism at Caltech," by Lawrence Badash and Judith R. Goodstein, copies available from Judith Goodstein, Institute Archives, Mail Code 015A-74, California In-

stitute of Technology, Pasadena, CA 91125. Other papers relating to Physics in America presented at the meeting include: "New Instruments and New Opportunities in early scientific Rocketry: The Migration of Physicists and Engineers to Geophysics, 1946-1958," by David Devorkin; "Geophysics as good Business: Academic Geophysics at the Harvard College Observatory," by Ronald E. Doel; "Groves and the Scientists: Compartmentalization and the Struggle to build the Bomb," by Stanley Goldberg, "Endless Politics on the Endless Frontier," by Daniel J. Kevles.

International Academic Conference on the Chinese Scientific and Technical History, IACCSTH The IACCSTH will be held in Hangzhou, Zhejiang Province of P.R.C. between August 25th and 30th, 1992. The conference is jointly sponsored by seven universities and institutes with an interest in the history of Chinese Science. It is being organized by the Hangzhou Association for Science and Technology and by the Hangzhou Institute of the History of the Chinese Science and Technology. The subjects of the conference are:

1. Exchange and Research: comparisons of Chinese and foreign scientific and technical history.
2. Chinese traditional science and technology and modern society.
3. Achievements, methods and characteristics of famous experts (Li Yan, Qiang BaoZong, Joseph Needham, Sou NeiQing, etc.).

The languages of the conference are English and Chinese. During the conference opportunities for visits will be provided to several museums, development zones, the Hemudu Cultural ruins, historical exhibitions and so on. Hangzhou is a very beautiful and famous historical city. The registration fee of \$200 includes paper abstracts and banquets; food and living accommodations are \$60 per day. If you would like to attend the conference, please write immediately to the Secretariat of the International Academic Conference on the Chinese Scientific and Technical History, 211 Yan'an Road, 310006 Hangzhou, Peoples Republic of China.

The second **International Conference on History and Philosophy in Science Teaching** - The Conference provides a forum for potential contributions of the history and philosophy of science to the teaching of science from elementary school through to graduate school. This will be the second occasion on which an international gathering of philosophers, historians of science, and science educators have met with science teachers, science administrators, and educational policy makers to investigate ways in which the history and philosophy of science has and can contribute to the preparation of science teachers, the development of curricula, the enhancement of science education and the development of a more scientifically literate community. The Conference will take place May 11th-15th, 1992, at Queens University in Kingston Ontario. For further information write to Dr. Skip Hills, Faculty of Education, Queens University, Kingston, Ontario Canada K7L 3N6.

The **Society for the History of Technology** will hold an annual meeting at Uppsala University in Sweden on August 16th - 21st, 1992. Contact Hákon With Anderson, Center for Technology and Science, University of Trondheim at Lade, 7055 Dragvoll, Norway or Uppsala Turist & Kongress, "SHOT", Box 216, S-751 04 Uppsala, Sweden.

The **XIXth International Congress of History of Science** is scheduled to be held in Zaragosa, Spain at the Science Faculty on August 22nd to 29th, 1993. The Congress Symposia will address themes of special interest. Scientific Sections will be devoted to the various branches and periods of the history of science. There will also be Poster Sessions. The official languages are: English, French, and Spanish. The first circular was to be ready this past summer. The director of the Program Committee is Professor Jean Dhombres, Centre National de la Recherche Scientifique, Unité No. 21, 49 rue Mirabeau, F-75016 Paris, France. For further information contact the Congress Office, Facultad de Ciencias (Matemáticas), Ciudad Universitaria, E-50009 Zaragosa, Spain.

The **Society for the Social Studies of Sciences (4S)** will hold its 1992 annual meeting jointly with the **European Association for the Study of Science and Technology (EASST)**. The meeting will take place in Gothenberg, Sweden on August 12th to 15th, 1992, and will focus on two primary themes, "500 Years After Columbus" (which will address the relations between science, imperialism, and development) and "Europe after 1992" (which concerns the implications of European integration for science.) Abstracts of papers are due January 31, 1992. For additional information, contact John Hultberg, Center for Science Studies, University of Gothenberg, S-41298 Gothenberg, Sweden.

GRANTS & FELLOWSHIPS

ACLS

The American Council of Learned Societies offers Fellowships and Grants-in-Aid to support postdoctoral research in all disciplines of the humanities including history. In addition ACLS has a new program for graduate students working on Ph.D. dissertations in specific fields and geographic regions. Most of these awards have deadlines in 1991 that will have passed by the time you receive this issue of the Newsletter. We suggest that you write to the ACLS and request that you receive their announcement for Fellowships and Grants Competitions to be held in 1992-93. American Council of Learned Societies, 228 East 45th Street, New York, NY 10017-3398.

AIP Center for History of Physics

Grants-in-Aid for travel of up to \$2,000 each continue to be available as described on page 53 of the previous issue of this Newsletter. For further information write to Spencer Weart, Center for History of Physics, 335 East 44th Street, New York, NY 10017. Deadlines have been June 30th and December 31st.

Department of Education's Fund for the Improvement of Postsecondary Education (FIPSE)

New grant opportunities were announced for science and humanities education projects. Three federal agencies are cooperating in a new effort to help colleges and universities develop undergraduate courses and curricula that link the sciences and humanities. The National Endowment for the Humanities (NEH), the National Science Foundation (NSF), and FIPSE are calling for grant proposals that reach across traditional academic disciplines to present students with a coherent interrelated view of the various fields of human knowledge. Supported projects might include efforts to improve core curricula, create new majors or develop new, integrated course sequences. The agencies are calling for projects that show the potential to become models for other colleges and universities across the country. It is planned to award a total of \$1 million for five to eight grants, including planning grants. The deadline for applications for this first year is April 1st, 1992 with funded projects beginning as early as fall 1992. For more information contact: The Division of Education Programs, National Endowment for the Humanities, Room 302 MR, 1100 Pennsylvania Avenue NW, Washington, DC 20506.

The Fulbright Scholar Program - The Council for the International Exchange of Scholars' brochure "The Fulbright Scholar Program: Grants for Faculty and Professionals, 1992-93" can be obtained from the Council, 3007 Tilden Street, NW, Suite 5M, Washington, DC 20008-3009.

National Endowment for the Humanities

I again urge you to get a copy of the NEH "**Overview**" of Endowment Programs; the most recent edition is dated July 1991. The "Overview" describes more than 30 funding opportunities.

Also in the "Overview":

- How to get application forms
- When to apply (all the way thru 1992)
- Whom to contact for help
- What project ideas are eligible for NEH funding and what ones are not.

Write or call NEH "Overview", Room 406, Telephone: (202) 786-0438.

NEH Divisions seem to be autonomous bodies, and one needs to contact the correct Division or program office in order to obtain information. The Divisions are: Education Programs (room 302), Fellowships and Seminars (316), Preservation and Access (802), Public Programs (420), Research Programs (318), State Programs (411). There is also the Office of Challenge Grants (429). The address of the National Endowment for the Humanities is 1100 Pennsylvania Avenue, N.W. Washington, DC 20506.

NEH College Teachers Summer Seminars Although the NEH sends us information on these programs early in January, due to the time consumed in preparing, printing, and mail distribution, the information would get to you after March 1st which is the deadline for receipt of applications. If you wish to know about these seminars or the possibility of directing such a seminar, we recommend that you write to NEH College Teacher Seminars Room 406, and request that you receive future schedules and lists of seminars.

National Science Foundation Programs

New guidelines under preparation for the Studies in Science, Technology, and Society program are supposed to consolidate into one announcement all the activities the program supports. The renamed and expanded SSTS program components are: Ethics and Normative Studies (ENS) and Historical, Social, and Philosophical Research in Science and Technology (HSPR). Modes of support include NSF Scholars Awards; Grants for Larger Research, Infrastructure or Education Projects and Professional Development Fellowships. The new guidelines should be available in October. For further information contact: Ronald Overman or Rachele Hollander, SSTS, Room 312, NSF, Washington, DC 20550; telephone (202)-357-9894.

BOOK PUBLISHERS

American Institute of Physics

Michael Eckert and Helmut Schubert **Crystals, Electrons, Transistors: From Scholar's Study to Industrial Research.** Translated by Thomas Hughes. Available from American Institute of Physics c/o AIDC, 64 Depot Road, Colchester, VT 05446.

American Mathematical Society

Peter Duren editor **A Century of Mathematics in America.** 3 vols. Many papers are on the development of mathematics departments across the country as well as articles by *Martin J. Klein* on the scientific style of *Josiah Willard Gibbs*, *Catherine S. Morawetz*

on the Courant Institute, *John Greenberg* and *Judith Goodstein* on Theodor von Kármán. Also included is an essay by *Uta Merzbach* on the study of the history of mathematics in America and a final essay by *Frederic F. Burchsted* on sources for the history of mathematics in American archives.

University of Arizona Press

William Sheehan **Planets and Perception: Telescopic Views and Interpretations, 1609-1909**

David W. Swift **SETI Pioneers: Scientists talk about their Search for Extraterrestrial Intelligence.**

Basic Books

Lawrence M. Krauss **The Fifth Essence: The Search for Dark Matter in the Universe.**

Bernard Lovell **Astronomer by Chance.**

For more information write: Basic Books, 10 East 53rd Street, New York, NY 10022.

Birkhäuser Verlag, Boston

Klaus Hentschu **Interpretationen und Fehlinterpretationen der speziellen und der allgemeinen Relativitätstheorie durch Zeitgenossen Albert Einstein.**

P. R. Masari **Norbert Weiner, 1894-1964** Write to Birkhäuser Boston Inc., P. O. Box 2485, Secaucus, NJ, 07096-2491.

University of California Press

Norman J. W. Throver editor **Standing on the Shoulders of Giants: A longer View of Newton and Halley.**

Richard G. Hewlett and Francis Duncan **Atomic Shield: A History of the USAEC. Vol II 1947-1952** (reprint)

Richard G. Hewlett **Atoms for Peace and War, 1953-1961: Eisenhower and the Atomic Energy Commission.** For more information write: University of California Press, Berkeley, California 94720.

Cambridge University Press

S. C. B. Gascoigne, K. M. Proust and M. O. Robins **The Creation of the Anglo-Australian Observatory.**

Derek Howse **Nevil Maskelyne: The Seaman's Astronomer.**

David Lindberg and Robert S. Westman editors. **Reappraisals of the Scientific Revolution.** Essays on recent work on the scientific revolution of the seventeenth century. The essays focus on issues within the sciences, the role of the universities and occult and magic in the scientific revolution.

James R. Moore editor. **History, Humanity and Evolution: Essays for John C. Greene.** Of interest is "The Nebular Hypothesis and the Science of Progress," by *Simon Schaffer*, 131-164.

J. V. Wall and *A. Boksenberg* editors. **Modern Technology and its Influence on Astronomy.**

David H. Wilson editor **The Correspondence between Sir George Gabriel Stokes and Sir William Thomson, Baron Kelvin of Largs.** 2 vols.

Joella G. Yoder **Unrolling Time: Huygens and the Mathematization of Nature.**

Paperback editions recently issued

J. B. Hearnshaw **The Analysis of Starlight: One Hundred and Fifty Years of Astronomical Spectroscopy.** For more information write to Cambridge University Press, 32, East 57th Street, New York, NY 10022.

Centre de Recherche en Histoire des Sciences et des Techniques, Paris

Andrew Butrica, Paolo Brenni, Christine Blondel, Peter Lundgren editors **Standardization and Units in Electricity, 1850-1914 Papers from an International Conference in Paris, July 1988.**

University of Chicago Press

Catherine Caulfield **Multiple Exposures: Chronicles of the Radiation Age.**

S. Chandrasekhar **Selected Papers. Vol. 5, Relativistic Astrophysics.**

Kameshwar C. Wali **Chandra: A Biography of S. Chandrasekhar.** For more information write to: University of Chicago Press, 5801 South Ellis Avenue, Chicago IL 60637.

Cornell University Press

N. Katherine Hayles **Chaos Bound: Orderly Disorder in contemporary Literature and Science.** The author traces changes in the meaning of the term chaos both in literature and in the sciences, beginning with James Clerk Maxwell and ending in non-linear dynamical systems. For more information write: Cornell University Press, P. O. Box 250, Ithaca, NY 14850.

Deutsches Museum

Rudolph Heinrich and *Hans-Reinhard Nachmann* editors **Walther Gerlach.** The volume consists of documents from his Nachlass on the centennial of the experimental physicist's birth. For more information write: Deutsches Museum, Munchen, Germany.

Deutscher Verlag

Georg Simon Ohm **Die Galvanische Kette: Mathematisch bearbeitet,** reprinted with introduction and commentary by *Lothar Dunsch.*

Rudolf Vierhaus and *Bernhard vom Brocke* **Forschung im Spannungsfeld von Politik und Gesellschaft: Geschichte und Struktur der Kaiser-Wilhelm-Max-Planck-Gesellschaft.**

Doubleday

Rosalyn Pflaum **Grand Obsession: Madame Curie and her World.** For more information write: Doubleday, 666 Fifth Avenue, New York, NY 10103.

Dover - New Paperbacks

Paul and Tatiana Ehrenfest **The Conceptual Foundations of the Statistical Approach in Mechanics,** translated by *Michael J. Moravcsik.* Reprint of the 1959 edition.

Max Planck **Treatise on Thermodynamics,** reprint of the 1922 edition.

Guy Robins and *Charles Shute* **The Rhind Mathematical Papyrus: An Ancient Egyptian Text.** For more information write to: Dover Publications, Inc., 11 East 2nd Street, Mineola NY 11501.

W. H. Freeman and Company

Particles and Forces: Readings from the Scientific American. For more information write to: W. H. Freeman, 41 Madison Ave., New York, NY 10010.

Greenwood Press

William Beaver **Nuclear Power goes on Line: A History of Shippingport.** For more information write: Greenwood Press, 88 Post Road W, Box 5007, Westport, CT 06881.

University of Indiana Press

G. Kass-Simon and *Patricia Farnes* editors. **Women of Science: Righting the Record.** Articles include one by *Judy Green* and *Jeanne Laduke* on women in mathematics and one by *L. M. Jones* on women in physics.

Italian Physical Society

G. Giuliani editor **The Origins of Solid State Physics in Italy, 1945-1960** Conference Proceedings, Pavia, September 1987. For more information write to: Italian Physical Society, Bologna.

Johns Hopkins University Press

James Rodger Fleming **Meteorology in America, 1800-1870**

Reissued in paperback

Alexandre Koyré **From the Closed World to the Infinite Universe.** For more information write: The Johns Hopkins University Press, 701 West 40th Street, Suite 275, Baltimore, MD 21211.

Alfred Knopf

Andrei Sakharov **Memoirs.** For more information write: Alfred A. Knopf, 201 East 50th Street, New York, NY 10022.

Longman

John Polkinghorne **Rochester Roundabout: The Story of High Energy Physics.** For more information write: Longman (division of Addison-Wesley) 95 Church Street, White Plains, NY 10601.

Macmillan

Stanley Blumberg editor **Edward Teller: Giant of the Golden Age of Physics.** For more information write: Macmillan Publications, 866 Third Avenue, New York, NY 10022.

M.I.T. Press

Phillip Bricker and *R. I. G. Hughes* editors. **Philosophical Perspectives on Newtonian Studies.** For more information write: MIT Press, 55 Hayward Street, Cambridge, MA 02142.

North-Holland

J. L. Boag and *P. E. Rubini* **Kapitza in Cambridge: The Life and Letters of a Russian Physicist.**

Armin Hermann, *J. Krige*, *U. Mersits* and *D. Pestre* with a contribution by *L. Weiss* **History of CERN vol. II** This volume covers the administrative, institutional and scientific history of CERN through the administrations of Felix Bloch, Cornelius Bakker, John Adams and Victor Weisskopf. The authors also deal with the technical developments involved in the second-generation accelerators of CERN and the relationships with industry necessary for such large-scale construction projects and the running of a large enterprise.

E. N. Shaw **Europe's Experiment in Fusion: The JET Undertaking.**

A. Sparlemijn and *M. J. Sparnaay* editors **Physics in the Making: Essays on Developments in Twentieth-Century Physics.** Among the articles are *Martin Klein* on Paul Ehrenfest as a teacher in Leiden, *P. T. Langsberg* on the concept of time in the twentieth century and *Abraham Pais* on Bohr's Copenhagen. For more information write to: North-Holland, P.O. Box 882, Madison Square Station, New York, NY 10160-0200.

Open Court

Elie Zahar **Einstein's Revolution: A Study in Heuristic.** For more information write: Open Court, 315 Fifth Street, Peru, IL 61354.

Oxford University Press

Anatole Abragam **Time Reversal: An Autobiography.**

J. R. Lucas P. E. Hodgson **Spacetime and Electromagnetism: An Essay on the Philosophy of the Special Theory of Relativity.**

Jeremy Gray **Ideas of Space**, second edition.

Doris B. Wallace and *Howard E. Gruber* **Creative People at Work** Of interest is an article on Michael Faraday by D. Tweney, 91-106. For more information write: Oxford University Press, 200 Madison Avenue, New York, NY 10016.

Paragon

D. E. Fisher **The Race to the Edge of Time: Radar-The Decisive Weapon of World War II.** For more information write: Paragon Publishers, 721 NE 21st Street, Oklahoma City, OK 73105.

Pergamon Press

Hermann Bondi **Science, Churchill and Me: The Autobiography of Hermann Bondi, Master of Churchill College.**

Errol Gotsman, *Yuval Ne'eman* and *Alexander Voronel* editors. **Frontiers of Physics.** Proceedings of the Landau Memorial Conference, Tel Aviv, 1988. In the history section there are reminiscences of Landau and his work, pp. 3-96.

I. M. Khalatnikov editor. **Landau: The Physicist and the Man** Recollections. Trans. J. D. Sykes. For more information write: Pergamon Press (division of Maxwell Communications) Maxwell House, Fairview Park, Elmsford, NY 10523

Princeton University Press

Frank Close **Too Hot to Handle: The Race for Cold Fusion.**

Chandra Mukerji **A Fragile Power: Scientists and the State.**

Harvey M. Sapolsky **Science and the Navy: The History of the Office of Naval Research.**

Princeton has begun a new series of reprints of the writings of scientists in paperback editions, including: *Pierre Duhem* **The Aim and Structure of Physical Theory.**

Albert Einstein **The Meaning of Relativity.**

Richard P. Feynmann **QED: The Strange Theory of Light and Matter.**

Werner Heisenberg *Encounters with Einstein and other Essays on People, Places and Particles.*

J. Robert Oppenheimer *Atom and Void.*

J. C. Polkinghorne *The Quantum World.*

Hermann Weyl *Symmetry.*

Recently reissued,

Charles Coulston Gillispie *The Edge of Objectivity*, with a new foreword by the author. For more information write to: Princeton University Press, Princeton, NJ 08540.

Rutgers University Press

Bertrand Goldschmidt *Atomic Rivals: A Candid Memoir of Rivalries among the Allies over the Bomb.* For more information write: Rutgers University Press, 109 Church Street, New Brunswick, NJ 08901.

Science History Publications

William Shea and **Antonio Spandafora** editors. *Creativity in the Arts and Sciences.* Includes *Samuel Y. Edgerton* on metaphysics and astrophysics in art on the eve of the scientific revolution, *Paola Galluzzi* on Leonardo da Vinci and *Paolo Brenne* on the design of scientific instruments. For more information write: Science History Publications, P. O. Box 493, Canton MA 02021.

Skinner House

A. Truman Schwartz and **John McEvoy** editors. *Motion Towards Perfection: The Achievement of Joseph Priestley* Essays include one on Priestley as a scientist, by **Robert E. Schofield**. Others are on Priestley as a radical social theorist, metaphysician, clergymen and on his American colleagues. For more information write: Skinner House (imprint of Unitarian Universalist Association), 25 Beacon Street, Boston, MA 02108-2800.

Springer-Verlag

Claus Habfast *Grossforschung mit kleinen Teilchen: Das deutsche Elektronen-Synchrotron, DESY, 1956-1970*

Ilse M. Fasal-Boltzmann editor **Ludwig Boltzmann** *Prinzipien der Naturphilosophie: Lectures on Natural Philosophy, 1903-1906* Includes an introductory essay by **Stephen G. Brush** and a concluding one by **G. Fasal**.

K. V. Lawrikainen *Beyond the Atom: The Philosophical Thought of Wolfgang Pauli.* For more information write to: Springer Verlag New York, P.O. Box 2485, Secaucus, NJ 07096-2491.

Stanford University Press

Henry De Wolf Smyth *Atomic Energy for Military Purposes: The Official Report on the Development of the Atomic Bomb under the Auspices of the U. S. Government, 1940-1945* Originally published, 1948. This edition includes a new foreword by Philip Morrison and an essay by Smyth. For more information write to: Stanford University Press, Stanford, CA 94305.

Franz Steiner Verlag

Richard L. Kremer editor *Letters of Hermann von Helmholtz to his Wife, 1847-1859* Franz Steiner Verlag, Stuttgart.

Temple University Press

Michael B. Stoff, **Jonathan F. Fanton** and **William R. Hal** *The Manhattan Project: A Documentary Introduction to the Atomic Age.* For more information write: Temple University Press, University Services Building, Room 305, Broad and Oxford Streets, Philadelphia, PA 19122.

Teubner

Hans-Georg Bartel **Walther Nernst.**

Roger Turner Books

Christine Blondel et al editors. *Studies in the History of Scientific Instruments.* Roger Turner Books, London.

University of Toronto Press

Robert Bothwell *Nucleus: The History of Atomic Energy of Canada Ltd.* For more information write: University of Toronto Press, 340 Nagel Drive, Checktowaga, NY 14225.

Touchstone, Simon and Schuster

Bruce Schechter *The Path of no Resistance: The Story of the Revolution on Superconductivity.*

VEB Johann Ambrosius Barth

Wolfgang Stiller **Ludwig Boltzmann: Altmeister der Klassischen Physik**

VDE Verlag

Werner Wiesbeck editor **Heinrich Hertz Symposium "100 Jahre Elektromagnetische Wellen,"** Karlsruhe 1988. Two of the papers are of interest, one on Hertz by James G. O'Hara and one on Hertz and Kirchhoff by D. S. Jones.

Verlag C. H. Beck

Kurt-R. Biermann editor **Carl Friederich Gauss "Fürst der Mathematiker" in Briefen und Gesprächen.**

Verlag Traugott Bautz

Thomas Hapke Die "Zeitschrift für physikalische Chemie": Hundert Jahre Wechselwirkung zwischen Fachwissenschaft, Kommunikatens medium und Gesellschaft.

Vrin

Gottfried Leibniz La naissance du calcul différentiel. Twenty six articles from the *Acta Eruditorum* edited and translated by *Marc Parmentier*. Vrin, Paris.

World Scientific

Michelangelo de Maria, Mario Grill and Fabio Sebastiani editors **The Restructuring of Physical Science in Europe and the United State, 1945-1960** Proceedings of an international conference, held in Rome, September 1988. The subjects covered are comprehensive, including the intellectual development, social institutions and structure and political entanglements of physics and physicists in all of western Europe and the United States. Authors include both physicists and historians of physics from the U. S. and Europe. For more information write: World Scientific, 687, Hartwell Street, Teaneck, NJ 07666-5309.

Yale

Martin Kemp **The Science of Art: Optical Themes in western Art from Brunelleschi to Seurat** Discusses the development of theories of perspective, color, of light and of visual perception that informed the work of a representative selection of western artists from the Renaissance to the late nineteenth century. For more information write: Yale University Press, 302 Temple Street, New Haven, CT 06520.

American Journal of Physics

1990, vol. 58

"The American Physical Society: A Survey of its first Fifty Years," by *Melba Phillips*, 219-230; "Lise Meitner's Escape from Germany," by *Ruth Levine Semi*, 262-267; "Einstein before 1905: The early papers on Statistical Mechanics," by *Clayton A. Gearhart*, 468-480.

American Philosophical Society, Memoirs

1989

"Inventing a genteel Tradition: MIT crosses the River," by *Bruce Sinclair*, 1-18.

American Scientist

1989, vol. 77

"The Invisible technician," by *Steven Shapin*, 554-563. On the role of technicians in recording and making scientific knowledge.

1990, vol. 78 "Hubble's Cosmology," by *Norris S. Heatherington*, 142-151.

Annals of the History of Computing

1989, vol. 11

"The Computer and the Brain: An International Symposium in Commemoration of John von Neumann, 1903-1957," 159-201. Of the essays in this collection there is one on von Neumann as a case study in scientific creativity and another on an interview with Edward Teller and Eugene Wigner.

Annals of the New York Academy of Sciences

1989, vol. 577

"Ethical Issues associated with scientific and technological research for the Military," editors *C. Mitcham, P. Siekevitz* The whole volume is devoted to this issue.

Arbeitskreis Geschichte der Geophysik in der deutschen Geophysikalischen Gesellschaft, Newsletter 1991 vol 10, No.1

"Meteorologie und Geophysik (kosmische Physik) an der Universität Innsbruck seit 1890. Zur Entwicklung der Meteorologie in Österreich," by *Gerhard Oberkofler and Peter Goller*.

Archives Internationales d'Histoire des sciences

1988, vol. 38

"The Solution of the inverse Problem of central Forces in Newton's Principia," by *E. J. Aiton*, 270-276.

Australian Studies in the History and Philosophy of Science

1990, vol. 8

"Historical, Philosophical and Social Studies of Experimentation in Science," edited by *H. E. Le Grand*. Of interest are, "Natural Philosophy, Experiment and Discourse in the Eighteenth-Century," by *John Schuster* and *Graeme Watchers* and "Humphrey Davy and Experiment," by *Jan Golinski*.

RECENT AND FUTURE ARTICLES**Acta Historiae Rerum Naturalium inec non Technicarum**

Prague 1989, vol. 20

"Revolution in Science, Sciences in Revolution," edited by *Jan Janko*. The whole volume is devoted to this issue. There are two articles of interest, one on quantum mechanics and the other on the quantum revolution in chemistry.

Biographical Memoirs of the Royal Society

1990, vol. 35

"Robert Saunders Mulliken, 1896-1986," by *H. C. Longuet-Higgins*, 329-374.

British Journal for the History of Science

1990, vol. 23

"What is a scientific Instrument, when did it become one, and why?" by *Deborah Jean Warner*, 83-93.

British Journal for the Philosophy of Science

1989, vol. 40

"Ernst Mach leaves 'The Church of Physics,'" by *John Blackmore*, 519-540. The author argues that Mach's debates with Planck about 1910 were a possible factor in Mach's opposition to Einstein theory of relativity.

Bulletin of the Scientific Instrument Society

1989, vol. 22

"Tycho Brahe's Innovations in instrument Design," by *Curt Roslund*, 2-4.

Cahiers pour l'histoire du CNRS 1939-1989, Nos. 1-6.

These first volumes cover the course of the struggle to establish the CNRS, the politics of research in France since 1939, the development of various sciences as research domains within CNRS, and its funding, both from the government and the Rockefeller foundation.

Chemistry in Britain

1989, vol. 25

"Lord Kelvin: An Intellectual Capitalist," by *Crosbie Smith*, 1214-1216.

Centaurus

1988, vol. 31

"Polygons and Parabolas: Some Problems concerning the Dynamics of planetary Orbits," by *E. J. Aiton*, 207-221.

1989, vol. 32

"Pourquoi Hertz et non pas Maxwell a-t-il découvert les ondes électrique?" by *S. d'Agostino*.

Dialectica

1989 vol. 43

"Bohr, Einstein and Realism," by *Daniel Wojciech*, 249-261.

Foundations of Physics

1989 vol. 19

"On Bohr's Response to EPR: A Quantum Logical Analysis," by *Jeffrey Bub*.

Historical Studies in the Physical and Biological Sciences

1989, vol. 20

"Franck and Hertz versus Townsend: A Study in two Types of experimental Error," by *Giora Hon*, 79-106. The author argues that both papers were in error and illustrate two types of possible errors. The first (Franck and Hertz) demonstrate the error of interpretation, the second (Townsend) that of theory or method.

History of Science

1990, vol. 28

"Polyphonic Music and Classical Physics: The Origins of Newtonian Time," by *Gez Szamosi*, 175-192; "Einstein's Natural daughter," by *Lewis Pyenson*, 365-378.

Invention and Technology

Fall 1990

"How von Neumann showed the Way," by *T. A. Heppenheimer*, 8-16.

Isis

1990, vol. 81,

"The Relativization of Centrifugal Force," by *Domenico Bertoloni Meli*, 23-43; "Sunspots, Galileo and the Orbit of the Earth" by *Keith Hutchison*, 68-74; "Journals in the History of Science," 281-308. A group of historians review the journals available in the history of the sciences. There are of course omissions but this is a good source for information on the major journals in the history of physics, chemistry and the various methodological and historiographic approaches that currently inform research in the intellectual, social and contextual history of the sciences.

Janus

1986-1990, vol. 73

"From *Physica* to *Nature*: The Fall of a most peculiar Phenomenon," by *Kostas Gavroglu* and *Gorgos Goudaroulis*, 53-84. On superfluidity.

Journal for the History of Astronomy

1990, vol. 21

"The Smithsonian Astrophysical Observatory Centennial," 107-153.

Journal of the Royal Astronomical Society of Canada

1989, vol. 83

"Edwin Hubble, 1889-1953," by *Allan Sandage*, 351-362.

Knowledge in Society

1989, vol. 8

"Instruments on the Cusp of Science and Technology: the Indicator Diagram," by *Davis Baird*, 107-122;
 "Editing and Epistemology: Three Accounts of the Discovery of the Weak Neutral Current" by *Andrew Pickering*, 217-232.

Notes and Records of the Royal Society

1989, vol. 43

"Huygen's *Traité de la Lumière* and Newton's *Opticks*: Pursuing and Eschewing Hypotheses," by *Alan Shapiro*, 223-247. 1990, vol. 44

"The latest on Newton," by *Derek Whiteside*, 111-117, an essay review of fifteen recent books on Newton.

NTM-Schriftenreihe für Geschichte der Naturwissenschaften, Technik und Medizin

1990, vol. 27, part 2

"Der königsberger Physiker Franz Ernst Neumann (1798-1895) und die Preussische Akademie der Wissenschaften zu Berlin," by *Andreas Trunschke*; "Thomas Young und die Herausbildung des Begriffs Elastizitäts-modul," by *Andreas Kahlow*.

Nuclear Physics

1989, vol. A502

"Discovery and Confirmation of Fission," by *Günther Herrmann*, 141c-158c.

Philosophia Naturalis

1989, vol. 26

"Über den Charakter von Einsteins philosophischen Realismus," by *Asaria Polikarov*, 135-158.

Physics Today

February 1991

"Ebert Spectrometer Reflections," by *William G. Fastie*.

Proceedings of the Royal Institution

1988, vol. 60

"The Scientific Research of John William Strutt, third Baron Rayleigh," by *John N. Howard*, 73-86.

1989

"Niels Bohr and Nuclear Weapons," by *Margaret Gowling*, 47-56.

Science in Context

1988, vol. 2

"Astronomers mark Time: Discipline and the personal Equation," by *Simon Schaffer*, 115-145; "Experimental Accuracy, Operationalism and the Limits of Knowledge, 1925-1935," by *Mara Beller*, 147-162.

Science Technology and Human Values

1989, vol. 14

"From Alchemy to Atomic War: Frederick Soddy's 'technology assessment' of atomic Energy," by *Richard E. Scolve*, 163-194.

1990, vol. 15

"Mapping Experiment as a Learning Process: How the first Electromagnetic Motor was invented," by *David Gooding*, 165-201.

Scientific American

1990, vol. 261 No.6

"Oliver Heaviside," by *Paul J. Nahin*, 122-129.

Social Science Information

1988, vol. 27

"Internationalism in Science as a Casualty of the First World War," by *Elizabeth Crawford*, 163-201, on the relations between the Allies and Germany as reflected in Nobel-Prize nominations for Physics and Chemistry.

Studies in the History and Philosophy of Science

1989, vol. 20

"Kant, Naturphilosophie and Oersted's discovery of Electro-Magnetism: A Reassessment," by *Timothy Shanahan*, 287-305; "Struggling with Causality: Schrödinger's Case," by *Yemina Ben-Menahem*, 307-334; "Henri Poincaré's Philosophy of Science," by *David Stump*, 335-363.

1990, vol. 21

"Hermann von Helmholtz: The Problem of Kantian Influence," by *S. P. Fullinwider*, 41-55; "James Jeans and Radiation Theory," by *Rob Hudson*, 57-76.

Studies on Voltaire and the Eighteenth Century

1989, No.264

"New Considerations on the Physical Sciences of the Enlightenment," by *Roger Hahn*, 789-796.

Technology and Culture

1989, vol. 30

"Technology and the Process of Scientific Discovery: The Case of Cosmic Rays," by *Charles A. Ziegler*, 939-963; "Nuclear Power and the Environment: The AEC and thermal Pollution, 1965-1971," by *Samuel J. Walker*, 964-992.

1990, vol. 31

"The Reorganization of Japan's Physical and Chemical Research Institute under American occupation," by *Samuel K. Coleman*, 228-250.

Today's Chemist

1990, vol. 3, No.1,

"Nuclear and Biochemical Pioneer, Martin D. Kamen," by *George B. Kaufmann*, 13, 17, 26-28.

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. In addition, for articles, please give author's mailing address and indicate whether reprints are available; for books published outside the U.S., indicate the U.S. distributor (if any) or complete mailing address of the publisher. 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.

NEWTON ON COLORS

David Topper *Newton on the Number of Colours in the Spectrum*, Studies in the History and Philosophy of Science, 1990, 21: 269-279.

Newton's division of the spectrum of white light into seven distinct colors was presented in the *Opticks* (1704) and subsequently almost universally adopted. But Newton's *Optical Lectures* of 1670-1671 reveal that he had initially set only five colors (red, yellow, green, blue and violet). Several hypotheses have been put forward to explain Newton's addition of orange and indigo, the most recent and seemingly persuasive being that Newton drew on the analogy between color and music (specifically the seven-tone scale of the octave). This article, however, qualifies that hypothesis by showing that, in fact, Newton introduced orange and indigo prior to making the analogy with music, and that his rationale was based upon aesthetic factors involving matters of symmetry and proportionality among the colors. Author's address, Dept. of History, University of Winnipeg, Winnipeg, Manitoba. R3B 2E9, Canada.

SEVENTEENTH AND
EIGHTEENTH CENTURY
ELECTRICITY

Michael Ben-Chaim *Social Mobility and Scientific Change: Stephen Gray's Contribution to Electrical Research*, British Journal for the History of Science, 1990, 22:3-24.

In the early 1730's Stephen Gray, an amateur naturalist living in London, publicized new experiments that disclosed, for the first time, the effect of electrical conductivity. The new discovery prompted the transformation of electrical research, its practices and theories. The paper discusses in detail Gray's experimental work and its objectives in the context of the democratiza-

tion of natural philosophy and the rising of experimental practices as a form of popular showmanship. Author's address, Sidney M. Edelstein Center for the History and Philosophy of Science, Technology and Medicine, Hebrew University, 91904 Jerusalem, Israel.

THE QUANTIFYING SPIRIT

Tore Frängsmyr, J.L. Heilbron and Robin E. Rider, editors *The Quantifying Spirit in the Eighteenth Century*, California University Press, 1990.

Historians of science from Uppsala and Berkeley have collaborated for some years on a project which has resulted in a book called *The Quantifying Spirit in the Eighteenth Century*. Thirteen authors investigate the passion for measurement, calculation, and rational order as it grew and flourished in the sunshine of Enlightenment philosophy. The "quantifying spirit" extended its influence far beyond the exact sciences such as astronomy into the thinking of soldiers, bureaucrats, linguists, and natural philosophers.

The Eighteenth century saw dazzling improvement in the accuracy of barometers, clocks, and devices for weighing and measuring. Exact measurements seemed to promise precise and useful truths.

The chapters tracing the manifestations of the quantifying spirit through theoretical and practical domains of knowledge — from metaphysics to forestry, from chemistry to political economy — are framed by an introductory essay and a bibliographical afterword. With wit and learning, the authors contribute not only to the History of Science but also to the History of Ideas about what science should be. In this important aspect of the cultural history of the Enlightenment, we see the early ascendancy of the scientific ideal, and an instrumental motivation which dominates our own time.

350TH ANNIVERSARY OF
DISCOURSI

C. S. Maffioli and L. C. Palm editors *Italian Scientists in the Low Countries in the Seventeenth and Eighteenth Centuries*. 334 pp., Amsterdam, Rodopi, 1989.

The publication of Galileo's *Discorsi* (Leyden, 1638) has never been considered as an example of a more general trend, namely the transmission of knowledge and the circulation of scientific ideas between Italy and the Netherlands from the Renaissance to the Enlightenment. This book, in which invited papers at a congress held in Utrecht to commemorate the 350th anniversary of the publication of the *Discorsi* are published, tries to fill the gap. To realize the relevance both for the history of the physical sciences and for the history of the Scientific Revolution of the Dutch-Italian relationships it is enough to glance at the titles: the subjects range from mechanics and astronomy to the science of waters and electricity, and the personalities from Beckmann and Galileo to Marsili and s'Gravesande, from Poleni and van Musschenbroek to Volta and Oriani. Author's address, Maffioli, Dept. History and Foundation of Mathematics and Science, University of Utrecht, Neuwe Gracht 187, 3512 LM Utrecht, The Netherlands.

SCIENTIFIC INSTITUTIONS

Tore Frängsmyr editor *Solomon's House Revisited: The Organization and Institutionalization of Science*, Nobel Symposium 75, Science History Publication, USA, P.O. Box 493, Canton MA 02021

In this book, these aspects of the organization and institutionalization of science are discussed by leading historians of science. It is a rich book that opens up discussion of the more practical but necessary side of science. While

emphasis is on the historical perspective, many articles also give insights into the story of modern and current science. The contents are divided into seven sections:

I. "The Role of the Academies in the Growth of Science", with articles by Roger Hahn, Michael Hunter, and Gunnar Ericsson.

II. "Universities vis-à-vis Free Associations": Matti Klinge, J.B. Morrell, Gullano Pancaldi.

III. "The State, the Church, and Secret Societies": B.J.T. Dobbs, Lorraine Daston, Inge Jonsson.

IV. "The Laboratory and the Workshop: Science and Industrialism": Eda Kranakis, Svante Lindqvist, Hans-Werner Schütt.

V. "Driving Forces behind Science: Prizes, Evaluation Systems, Career": Robert Marc Friedman, David Edge, Aant Elzinga.

VI. "National or International: The Role of Big Science": Elizabeth Crawford, John Krlige, Gösta Ekspong.

VII. "Concluding Discussions": Paolo Galluzzi, Mary Jo Nye, J.L. Hellbron.

MAXWELL'S DEMON

Harvey S. Leff and Andrew F. Rex, editors, *Maxwell's Demon: Entropy, Information, Computing* Princeton NJ: Princeton University Press, 1990. (Outside the U.S.A., Canada and Japan this book is available from Adam Hilger, IOP Publishing Ltd., Bristol, England.)

About one hundred and twenty years ago, James Clerk Maxwell introduced his now legendary hypothetical "demon" as a challenge to the integrity of the second law of thermodynamics. Fascination with the demon persisted throughout the development of statistical and quantum physics, information theory and computer science—and linkages have been established between Maxwell's demon and each of these disciplines. Until now its important source material has been scattered throughout diverse journals. This book brings under

one cover twenty-five reprints, including seminal works by Maxwell and William Thomson; historical reviews by Martin Klein, Edward E. Daub and Peter Heimann; information theoretic contributions by Leo Szilard, Leon Brillouin, Dennis Gabor and Jerome Rothstein; and innovations by Rolf Landauer and Charles Bennett illustrating linkages with the limits of computation. An introductory chapter summarizes the demon's life, from Maxwell's illustration of the second law's statistical nature to the most recent "exorcism" of the demon based upon a need to periodically erase its memory. An annotated, chronological bibliography provides a colorful historical perspective.

MAXWELL'S DEMON

Harvey S. Leff and Andrew F. Rex *Resource Letter MD-1: Maxwell's Demon*, American Journal of Physics, 1990, 58: 201-209.

This Resource Letter provides a comprehensive guide to the voluminous literature that has developed around Maxwell's demon and offers a perspective on issues for which Maxwell's hypothetical character has inspired continuing research and debate. A listing of 223 citations, many of which are annotated, cover early contributions, historical works, reviews, general background and specialized books and research articles. Topical coverage includes Szilard's one-molecule engine, Maxwell's temperature and related demons, information and thermodynamics and the limits of computation. Author's address, Leff, Physics Dept., California State Polytechnic University, 3801 West Temple Ave., Pomona, CA 91768-4031.

PHYSICS TEACHING LABORATORIES

Graeme Gooday *Precision Measurement and the Genesis of Physics Teaching laboratories in Victorian Britain*, British Journal for the History of Science, 1990, 23: 25-51.

Academic laboratories for teaching physics were first established in Britain during 1866 and came to be regarded as essential parts of tertiary education by the 1880's. They were in-

stitutions primarily devoted to training students in the skills of precision measurement, and this distinctive character can be traced to three contextual factors in their genesis. First, the operation of these laboratories drew upon the techniques and instruments of contemporary high precision research in telegraphy and thermodynamics. Their role was also molded by debates concerning the efficacy of exact workmanship in competitive industrial practice. Finally, the measurement operation of these physical laboratories was designed to displace the hegemony of classics and mathematics as the traditional sources of education in highly valued modes of accurate reasoning. Author's address, Room 174, Physics Laboratory, Unit for the History of Science, University of Kent, Canterbury, CT2 7NR, England.

JEAN BECQUEREL

Helge Kragh, *Concept and Controversy: Jean Becquerel and the Positive Electron*, Centaurus, 1989, 32: 203-240.

The history of the concept of corpuscular positive electricity in the period 1860-1920 shows that positive electrons played an important part in nineteenth-century physics. The reasons for the changes in the acceptability of the positive electron are discussed and a detailed account given of Jean Becquerel's claim to have discovered the particle in 1907. The discovery claim gave rise to a controversy, the outcome of which was an affirmation of the one-electron paradigm. The paper includes a brief discussion of positive electrons in the 1920's before the positron. Reprints available from the author Roskilde University Centre, P. O. Box 260, 4000 Roskilde Denmark.

THE SOLVAY CONFERENCES

Mary Jo Nye, *Chemical Explanation and Physical Dynamics: Two Research Schools at the first Solvay Chemistry Conferences, 1922-1928*, Annals of Science, 1989, 46: 461-480.

The convening of the first three Solvay Chemistry Conferences in Brussels from 1922-1928 marked an important turning point for the discipline of chemistry. Two competing schools of

chemical dynamics at the conferences were a predominantly English group who worked out electron and ionic interpretations of organic reaction mechanisms and a French group who developed a generalized radiation hypothesis of reaction activation. Their point of agreement lay in the need to develop a theoretical chemistry complementary to theoretical physics. Author's address: Dept. of the History of Science, The University of Oklahoma, 601 Elm, Room 621, Norman, Oklahoma, 73019.

RELATIVITY, QUANTUM THEORY AND GRAVITATION

Mendel Sachs, *On the Origin of Spin in Relativity*, *British Journal for the Philosophy of Science*, 1989, 40: 409-412.

Spin in physics originates in the symmetry imposed by relativity theory. Expressed most compactly, this is in the form on an algebraic symmetry group. This yields the spin degrees of freedom in the basis functions of the irreducible representations of the group. Thus the spin variable in the laws of matter is a unique consequence of the algebra of relativity in any theory of matter, and not a feature unique to the quantum theory per se. Author's address: Dept. of Physics and Astronomy, 239 Fronczak Hall, University of Buffalo, Buffalo, New York, 14260.

NEUTRONS

Michael Eckert, *Neutrons and Politics: Maier-Leibnitz and the emergence of pile neutron research in the Federal Republic of Germany*, *Historical Studies in the Physical and Biological Sciences*, 1988, 19: 81-113

Pile neutron research became an international scientific activity when reactors spread throughout the world as a consequence of the Atoms-for-Peace Program in the mid-fifties. The case of Maier-Leibnitz, director of the first German Atoms-for Peace research reactor and a most influential nuclear policy advisor in the German Atomic Energy Commission, illustrates how nuclear science was used as a political instrument and at the same time took profit from its political role. Reprints available, author's address: Chopinstrasse 32, D-8000 Munich 60, Germany.

SCIENTIFIC BALLOONING

David H. DeVorkin, *Race to the Stratosphere: Manned Scientific Ballooning in America* ix+406 pp. New York: Springer-Verlag, 1989.

In many respects, save for the scale of the enterprise, the Apollo program of the 1960s had its antecedent in the manned ballooning efforts in the United States during the 1930s. The salient factors that have led to this conclusion are treated here, along with detailed descriptions of the scientific agendas that each promoter held for manned scientific ballooning in the 1930s. Stimulated by the stratospheric flights of Auguste Piccard in Europe in 1931 and 1932, a race for supremacy in the stratosphere between the American military services was run in the name of science, even though, as in the Apollo era, these feats of engineering, daring and skill were funded for reasons quite apart from the science. Prominent physicists such as Compton, Millikan, Swan, and O'Brian signed on for these flights, although all eventually turned to automated radiosondes to continue their cosmic-ray and atmospheric physics studies. Although initiated by civilian interests in the 1930s, by the end of the decade, and especially in the immediate post-war era, subsequent interests in high altitude manned ballooning were completely within the province of the military services.

ASTRONOMY AND ASTROPHYSICS

Allan Chapman, *William Herschel and the Measurement of Space*, *Quarterly Journal of the Royal Astronomical Society*, 1989, 30: 399-418

In his attempt to determine the "length, breadth and profundity" of space, Herschel was faced with novel physical problems. Unlike contemporary positional astronomers, his interests had no established instrumentation or techniques of mathematical analysis upon which to draw. In his investigation of stellar structures he used taxonomic methods similar to those of contemporary naturalists. His reflecting telescope technology aimed to "gauge" space by comparing stellar brightnesses, until encountering the barriers imposed by a pre-industrial precision technology.

WILLIAM LASSELL

Allan Chapman, *William Lassell (1799-1880): Practitioner, Patron and 'Grand Amateur' of Victorian Astronomy*, *Visitas in Astronomy*, 1988, 32: 341-370.

Lassell was the first astronomer to significantly develop the reflecting telescope beyond Herschel. Utilizing steam-powered precision engineering techniques borrowed from industrial manufacture, he made large-aperture and optically homogeneous mirrors. He was also the first astronomer to mount large reflectors in the equatorial plane. Lassell's entire operation was financed from the profits of a brewery business, from which he proceeded to make fundamental discoveries in planetary astronomy, combining finance, instrumentation and research in one enterprise. Author's address: Wadham College, Oxford, OX1 3PN, United Kingdom.

AIRY & NEPTUNE

Allan Chapman, *Private Research and public Duty: George Biddell Airy and the Search for Neptune*, *Journal for the History of Astronomy*, 1988, 19: 121-139.

Airy is often remembered for his failure to discover Neptune. From a study of the Astronomer Royal's private papers at Cambridge, however, it is clear that assisting with a private investigation was not deemed part of his public duty. He also doubted the validity of Adams's mathematical technique, especially as Adams failed to reply to letters requesting clarification. Autumn 1845, moreover, saw Airy swamped with Railway Gauge business and the Royal Observatory in turmoil due to a murder investigation.

MOUNT WHITNEY EXPEDITION

Donald E. Osterbrock, *To Climb the highest Mountain: W. W. Campbell's 1909 Mars Expedition to Mount Whitney*, *Journal for the History of Astronomy*, 1989, 20: 77-95

Astronomy at 14,500 feet. To probe the atmosphere of Mars for water vapor, the basis for intelligent life on the red planet that Percival Lovell had enthusiastically reported, W. W. Campbell needed a telescope and a spec-

trograph above most of the earth's atmosphere. This he could achieve in the first decade if the century only by packing them by mule train to the top of the highest mountain in the United States during a narrow window of opportunity, in an early parallel (in many respects) to a modern NASA mission. Author's address: Lick Observatory, University of California, Santa Cruz, CA 95064.

PHYSICS IN CANADA

Yves Gingras, *Physics and the Rise of Scientific Research in Canada* 216 pp. Montreal, McGill University Press, 1991

Through the study of the formation of the discipline of physics in Canada this book shows how, between 1850 and 1960, institutions, such as the universities and the Royal Society of Canada, were transformed to suit the needs of researchers. The role of the National research Council in fostering the development of research through fellowships for graduate students, grants-in-aid to researchers and the creation in 1929 of the *Canadian Journal of Research* is also analyzed. The debates surrounding the formation of the Canadian Association of Professional Physicists in 1945 suggest that disciplines and professions are two distinct ways of defining the social identity of the physicist. Author's address: D'pt. d'Histoire, Université du Québec à Montréal, Case Postale 8888, succursale A, Montréal, Québec H3C 3P8, Canada

JAPANESE PARTICLE PHYSICS

Morris F. Low, *Accounting for Science: The Impact of Social and Political Factors on Japanese Elementary Particle Physics*, *Historia Scientiarum*, 1989, 36: 43-65.

The history of Japanese elementary particle physics provides a prime example of the claims that the acceptance or rejection of scientific ideas has been influenced by 'external' factors acting on scientists. This paper examines such claims by focussing on the 'meson' theory formulated by Hideki Yukawa and the 'Sakata' model named after its originator Shoichi Sakata. Accounts of the development of these theories are outlined, evaluated and then

placed within a context which suggests ways in which they can be understood. Author's address: Dept. of Japanese Studies, Monash University, Clayton, Victoria 3168, Australia.

COLONIAL SERVICE

Lewis Pyenson, *Pure Learning and Political Economy: Science and European Expansion in the Age of Imperialism*, in *New Trends in the History of Science*. The proceedings of a conference held at the University of Utrecht, 1989, 209-278

This is a survey of the ways in which science, scientific research, institutions and the scientists that worked in them were aspects of the policies of imperial expansion in the late nineteenth and early twentieth centuries. The sciences that were pursued at these colonial institutions were not just the more obvious ones of the geophysical and natural sciences but included physics. The scientists who served in these colonial institutions became, for their governments, propagandists for their culture. For the scientists the years in colonial service were rational steps in the development of careers in Europe, many returning to promotions to prestigious chairs in their native countries.

SHANGHAI & ALGIERS, 1920-1940

Lewis Pyenson, *Habits of Mind: Geophysics at Shanghai and Algiers, 1920-1940*, *Historical Studies in the Physical and Biological Sciences*, 1990, 21: 161-196.

An account of the role of the sciences in the French government's imperial ambitions in the years between the two World Wars. The control exercised over the physics in these colonial outposts represented an unprecedented degree of central control in comparison with the efforts by other colonial powers. Under these circumstances it was difficult to rise above the level of a colonial functionary. Yet some did, in quite extraordinary ways, detailed here, producing significant scientific results, under difficult bureaucratic circumstances. Author's address: Dépt. d'histoire, Université de Montréal, Case Postale 6128 succursale A, Montréal, Québec H3C 3J7, Canada.

SCIENCE IN AUSTRALIA, 1888-1988

R. W. Home, *The Physical Sciences, in String Sealing Wax and Self-Sufficiency in the Commonwealth of Science: AN-ZAAS and the Scientific Enterprise in Australasia, 1888-1988*, edited by Roy McLeod. Melbourne, Oxford University Press, 1988, 147-165

A survey of the history of Australian physics and its institutions in the century following the formation of the first national scientific organization, the Australasian (later, Australian and New Zealand) Association for the Advancement of Science.

AUSTRALIAN SCIENCE

R. W. Home editor, *Australian Science in the Making*, xxx+413 pp., Sydney/Cambridge/New York, Cambridge University Press, 1988

Fifteen essays on aspects of the history of science in Australia, together with an Introduction by the editor. The following chapters relate to the history of physics "Cancer, Physics and Society: Interactions between the Wars," by H. Hamersley; "Science on Service, 1939-1945," by R. W. Home; "Early Years of Australian Radio Astronomy," by Woodruff T. Sullivan III, (a summary of this contribution appears in the *Newsletter* of October 1989); "Australian Astronomy since the second World War," by S. C. B. Gascoigne.

WOMEN IN PHYSICS

Joan Freeman, *A Passion for Physics: The Story of a Woman Physicist*. 240 pp Adam Hilger, Bristol, England, distributed in the U. S. A. by American Institute of Physics, c/o AIDC. 64, Depot Road, Colchester VT, 05445.

The autobiography of a woman's struggles to first, gain a scientific education in pre-WWII Australia, then establish a career during the Depression. She also recounts her experiences in the war-time radar establishment in Sydney, her marriage, the trials and tribulations of working at the Cavendish laboratory and her transition to the Atomic Research Establishment at Harwell. A rare example of introspection, by an even rarer breed—the woman physicist.

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