

History of Physics Newsletter

Volume III, Number 4

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DIVISION NEWS

APS MEETINGS

The Division of History of Physics will sponsor sessions at the following APS meetings in 1989.

San Francisco, "50th Anniversary of the Discovery of Fission."

January 15, 1989, This is a joint meeting of APS, AAPT, & AAAS (also see page 53); this session is cosponsored by the AAPT. It is being organized by L. Badash (APS) and John Rigden (AAPT). Speakers include:

Spencer Weart: "Why Wasn't Fission Recognized Sooner?"

Alan Beyerchen: "Politics and the Discovery of Fission in Nazi Germany"

Emilio Segrè: "The Discovery of Fission: 1934-1938"

St. Louis, "History of Optical Properties of Condensed Matter"

March 20-24, 1989. The session is being organized by Heinrich Medicus. Speakers include:

Manuel Cardona: "Rayleigh, Brillouin, Raman, etc. Scattering in Solids, Particularly Semi-conductors"

Frederick Seitz: (tentative title) "F, V, etc. Centers"

Nicolaas Bloembergen: (tentative title) "Non-linear Optics in Condensed Matter"

Baltimore, "History of Cosmic Rays"

May 1-4, 1989

This session is being organized by Allan Needell.

Baltimore, "How Theories Are Accepted"

This session is being organized by Stewart Gillmor.

NOMINATIONS FOR OFFICERS

The Nominating Committee for the 1989 election consists of Peter Galison (Chair), Stephen Brush, and Allan Needell. The Nominating Committee would appreciate receiving suggestions for nominees who are willing to be Vice-Chairperson (to become Chairperson in 1990) and/or members of the Executive Committee who serve for three years. The names should be sent as soon as possible to Professor Peter Galison, Department of Philosophy, Stanford University, Stanford, CA 94305. All members of the History of Physics Division are eligible for nomination. The members are listed in the most recent APS membership directory.

ELECTION RESULTS

Max Dresden was elected Vice-Chairperson of the Division of History of Physics for 1988 and will serve as Chairperson in 1989. He is Executive Officer at the Institute for Theoretical Physics at SUNY at Stony Brook. He was holder of the Kramers Chair in Utrecht in 1976 and the van der Waals Chair in Amsterdam in 1967. His research in theoretical physics has dealt with statistical mechanics, S matrix and field theory, and a broad spectrum of mathematical physics subjects. He was one of the group that took the initiative in organizing the Division of History of Physics. He was the first History of Physics Division Councillor. He has spent ten years on the biography of H. A. Kramers, "Between Tradition and Revolution", which was published in 1987.

Professor C. Stewart Gillmor was elected Secretary-Treasurer and he will serve for three years. He is Chair of the Department of History at Wesleyan University, Middletown, CT. He was a Fullbright Fellow at the Cavendish Physical Laboratory in 1976; NASA History Scholar, 1981; NSF-CNRS Research Fellow in terrestrial and planetary physics in Paris in 1985. He is author of a book on Coulomb and about 40 papers. History Editor of Transactions of the AGU, 1983-86. Editor of History of Geophysics series, 1983-. His major area of research is history of physics and engineering 1750-present.

The Division elected **Arthur I. Miller** and **Melba Phillips** to serve three year terms on the Executive Committee.

Arthur Miller is University Professor of Philosophy and History, University of Lowell, and an Associate of the Physics Department at Harvard. During 1977 he was at the École Pratique des Hautes Etudes in Paris. He has been the recipient of fellowships and grants from the Guggenheim Foundation, the Am. Phil. Soc., the ACLS, the NEH, the NSF, and others. His interests include the history and philosophy of nineteenth and twentieth century science and technology. He is the author of books on Einstein, on 20th Century Physics, on Frontiers in Physics: 1900-1911. He is the editor of a Source book on Quantum Field Theory. He has been an Associate Editor of AJP. He was Vice Chairperson and Chairperson of this Division.

Melba Phillips is Professor Emeritus of the University of Chicago. Her honors include the Oersted Medal of the AAPT and the Compton Award of the AIP. Her physics research interests were mainly in the theory of atomic spectra. She has worked on physics education, and she has

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 the History of Physics of \$10 per volume (\$5 additional for airmail). Each volume consists of 5 issues; we expect to publish two issues per year. Editor: *Albert Wattenberg*, Department of Physics, University of Illinois, Urbana, IL 61801. Associate Editors: *Stephen G. Brush*, Dept. of History and Institute for Physical Science and Technology, University of Maryland, College Park, MD 20742, and *R.D. Sard*, Department of Physics, University of Illinois, Urbana, IL 61801.

(election results continued)

edited two reprint collections: "History of Physics - Readings From Physics Today" (with Spencer Weart) and "Physics History from AAPT Journals." She is co-author with Panofsky of "Classical Electricity and Magnetism," and with Bonner of "Principles of Physical Science."

Previously elected members of the Executive Committee are: Chairperson, **Lawrence Badash**; Past-Chairperson, **Roger Stuewer**; Division Councillor, **Stephen G. Brush**; Executive Committee members: **Peter Galison** and **Sallie A. Watkins**; **Emilio Segrè** and **Daniel Siegel**; ex-officio the Director of the Center for the History of Physics, **Spencer Weart**.

EXECUTIVE COMMITTEE

The Executive Committee held its annual meeting on April 19, 1988 in Baltimore, MD. Highlights of the discussions are given below:

1. Chairperson Stuewer reported that the invited papers sessions of the History Division continue to be very well attended. The session on the "History of Cosmology" was the first part of an all day workshop organized for Maryland high school physics teachers by Stephen Brush for the Education Committee of the APS. Stuewer has encouraging progress on raising funds for History Book Prize; the Division has to find matching funds for an initial contribution.

2. Report of S. G. Brush, Division Councillor:

a) **Limit on Memberships in Divisions, etc.** Last year the APS Council had been urged by W.W. Havens and H. Lustig to allow each APS member only one free membership in a Division, Topical Group, or Section. The reason was to try to limit the expenses caused by some people belonging to several sub-units of the APS. The majority of the APS Council opposed this approach to solving the problem. An alternative solution that is being considered is to have a small addition to the previously scheduled

increases in dues in order to pay for Division and other sub-unit activities but not to discourage APS members from joining as many Divisions as they like.

b) **Future Patterns of APS Meetings** The Council of the APS, at its meeting of 4/24/87, created a "Task Force" consisting of all Division and Forum Councillors to make recommendations on future patterns of APS meetings. The proposals of the "Task Force" include transferring management of the March and April large APS meetings to Steering Committees composed of representatives of those Divisions that play major roles in those meetings. The DHP representative was included on the steering committee of the March meeting. Stephen Brush proposed to transfer the History of Physics representation to the steering committee of the April meeting. This would preserve the status quo and our continuing to use April as our official annual meeting. None of this prevents the History Division from sponsoring sessions at any other general APS meeting; Brush's proposal would allow us to have a voice in planning the April meetings. There is a preference for holding it in the Washington DC area, but APS should not be locked into this because flexibility is needed in negotiation with hotels.

The January APS Meeting - The "Task Force" is proposing to drop the January meeting as an official APS "general meeting." Very few research papers are being presented at January meetings. It will continue as a general APS meeting thru 1992. The History Division wishes to maintain an involvement of the APS in joint sessions with the AAPT which are in January. The Executive Committee instructed the Division Councillor "To convey to the APS the sentiment of the History of Physics Division that the January meeting remain a general meeting. The Division recognizes its obligation to provide additional involvements at the January meetings."

3. L. Badash is planning on having four sessions of invited papers at general APS meetings in 1989. (See above APS MEETINGS.) If you have suggestions for topics for future sessions of the Division and/or you are willing to help in organizing sessions of invited papers, write to the current vice-chairperson of the Division, Professor Max Dresden, Department of Physics, SUNY at Stony Brook, Stony Brook, NY 11794

4. Stephen Brush reported for the Division's APS Fellowship committee that its first recommendation to the APS had been approved. **Lawrence Badash** was made a **Fellow of the American Physical Society**.

5. Rita Lerner of the AIP reported on new volumes being published as part of the AIP-Tomash series. 1987 books in the series include: "Basic Bethe: Seminal Articles on Nuclear Physics, 1936-1937," by Bethe, Bacher,

and Livingston with a preface by Bethe and an Introduction by R. Stuewer; "A History of the Theories of Aether and Electricity," by Edmund T. Whittaker with an introduction by Arthur Miller, volume I is "Classical Theories" and volume II is "Modern Theories 1900-1926"; "Radar in World War II" by Henry E. Guerlac, with a forward by Dale Corson and an introduction by John Rigden and I. I. Rabi; "Atoms in the Family" by Laura Fermi. In the coming year they are planning on publishing "Quantum Physics in America" by Katharine R. Sopka, and Henri Poincaré's "New Methods of Celestial Mechanics." Consideration for future publications is being given to books by Jeans, Eddington, and Lorentz.

COMMITTEE APPOINTMENTS

The appointed Committees of the Divisions for 1988-1989 are:

- Nominating Committee - see coverage 49.
- Program Committee: L. Badash (Chair), Stewart Gillmor, H. Medicus, Allan Needell.
- Fellowship Committee: S. Brush (Chair), G. Baym, L. Brown, E. Segrè, and L. Badash.

APS and AIP NEWS

Nominations for APS Committees - Each year, during February or March, the APS Committee on Committees and Nominating Committee send a request to the chairperson and secretary-treasurer of the Division of the History of Physics for recommendations for various APS committees. The committees include: Publications, International Freedom of Scientists, Opportunities in Physics, Applications of Physics, Fellowships, Constitution and By-laws, Finance, Status of Women in Physics, Minorities, Nominating, Panel on Public Affairs, and for Councillors at Large. If you have suggestions of people who would be interested and willing to serve on specific committees, please send their names and vitae to the present chairperson of our Division, Prof. Lawrence Badash, Department of History, Univ. of California at Santa Barbara, Santa Barbara, CA 93106

AIP Center for History of Physics Study of Scientific Collaborations - The Center for History of Physics Newsletter of May 1988 announced the beginning of the first two years of a long-term project to study the complex issues facing the historical documentation of multi-institutional collaborations in physics and allied sciences. In a number of fields of physics collaborations of physicists and their institutions are using national facilities such as accelerators, synchrotron sources, research reactors, telescopes, space vehicles, special computers, etc. An appreciable fraction of significant research reported in recent years has come from such collaborations.

Meaningful records of such teams have not yet been secured by historians and other scholars. The purpose of the new archival research project is to put the AIP - and the archival community as a whole - in a position to provide guidance on the documentation of collaborations. During the initial two years, the project staff will study the field of high-energy physics experiments conducted since 1970 at the National Accelerator Laboratories of the Department of Energy. Preliminary plans for subsequent fields to be studied include space science and geophysics. The Center staff will be joined in this effort by a number of distinguished scientists and scholars from a broad cross-section of institutions.

Outside funding is in hand to initiate the work on high-energy physics later this year; the National Historical Publications and Records Commission has granted partial support and the NSF has stated a long-term commitment to the study. **The Center is seeking to hire project staff**, including a project historian and a project archivist. For further information contact Joan Warnow, at the AIP Center for History of Physics, 335 East 45th Street, New York, NY 10017.

AIP-CHP Grants-In-Aid - The Center for History of Physics of the AIP has a program of small GRANTS-IN-AID for research in the history of 19th and 20th century physics and allied sciences (such as astronomy, geophysics, and optics) and their social interactions. Grants will be for a maximum of \$2000 each. They can be used only to reimburse direct expenses connected with work in these fields. Preference will be given to those who need funds to use the Center's Niels Bohr Library in New York City, or to microfilm papers or to tape oral interviews with a copy to be deposited in the Library. Applicants should be working towards a degree in the history of science, or have a record of publication in the field. Deadlines for receipt of applications are June 30th and December 31st. For more information write to Spencer Weart, Center for History of Physics, American Institute of Physics, 335 East 45th Street, New York, NY 10017.

The University of Pittsburgh Library System has been selected by the American Institute of Physics as a library of deposit for the Archives for the History of Quantum Physics.

ANNOUNCEMENTS & REPORTS

Stephen G. Brush Elected Vice-President of HSS

The History of Science Society announced that **S.G. Brush**, Professor in the Department of History and in the Institute for Physical Science and Technology at the University of Maryland, has been elected Vice-President for 1988 and 1989. He will serve as President in 1990 and 1991. Brush is currently the Councillor for the Division of

History of Physics of the APS. The President of HSS for 1988 and 1989 is **Mary Jo Nye**, Professor at the University of Oklahoma.

Historian of the U.S. Naval Observatory

It has been announced that **Stephen J. Dick** has been appointed the first Historian of the U.S. Naval Observatory. He will undertake a program of archival collection, oral histories, research, and writing.

Jeffrey L. Sturchio now at A.T.&T.

Jeffrey L. Sturchio has left the Beckman Center for the History of Chemistry and accepted a position at the A.T.&T. Bell Laboratories Archives in Warren, New Jersey. He will continue as Book Review Editor of *ISIS*.

Pulitzer Prizes for History Books

The General Nonfiction Pulitzer Prize for 1987 has been awarded to **Richard Rhodes** for his historical book, *The Making of the Atomic Bomb*. Not only is it a comprehensive history of the bomb, but it is written in an elegant narrative style. It has the most extensive bibliography of any book on this subject. The History Pulitzer Prize for 1987 was awarded to **Robert V. Bruce** for his book, *The Launching of Modern American Science, 1846-1876*.

The Bakken Library

The Bakken opened about twenty years ago; its library has grown to over 12,000 volumes and its museum to around 2,000 instruments, which taken together form one of the finest centers in the world for studying the history of electricity. It is located in southwest Minneapolis. Included in its holdings are works by major figures such as Franklin, Galvani, and Volta. The collections focus on the period 1700-1900. Available in The Bakken is a continuous line of source materials, dating from Otto von Guericke's demonstrations of global forces (static electricity) in 1663 to Ewald von Kleist's letters on the discovery of the Leyden Jar in 1745-46. These early materials are of particular value, as they include plates coordinated with narrative description of electrical phenomena, making it possible for one to follow a line of inquiry not guided by a particular theoretical design.

Of equal interest are the documents from the second generation of German electricians, materials from the period 1750-90, which were designed for the education of the young in electricity. With support from the NSF Program of the Division of Teacher Preparation and Enhancement, there have been **summer workshops for high school physics teachers** at the Bakken Museum and Library. The teachers repeated historically significant experiments. For those with further interest in electricity in eighteenth-century life, there is an *Electric Quarterly* available from The Bakken, 3537 Zenith Avenue S., Minneapolis, MN 55416.

Dudley Observatory Awards

The Dudley Observatory has chosen **Dr. Kevin D. Pang**, of the Jet Propulsion Laboratory, California Institute of Technology, as the 1988 winner of the Herbert C. Pollock Award for research in the History of Astronomy and Astrophysics. The \$10,000 Award will help support Dr. Pang's project, "A Study of Ancient Chinese Astronomical Records," which should provide an accurate absolute chronology of ancient Chinese solar and lunar eclipse records.

Lesser Dudley Awards were voted for **Dr. Norris S. Hetherington** at the Office for History of Science and Technology, University of California, Berkeley, for the preparation of an "Edition of Edwin Hubble's Unpublished Manuscripts," and to **Mr. Paul W. Luther**, of Astronomy Books, Bernardston, Ma., for preparation of a "Bibliography of Nineteenth Century Astronomy in the United States, including Books and Separately Published Pamphlets".

The **Herbert C. Pollock Award** is for support of an innovative research project in the history of astronomy or astrophysics by a faculty member, research associate, or postdoctoral student with an institutional association. 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 more information from the Pollock Awards Committee, Dudley Observatory, 69 Union Ave., Schenectady, NY 12308. (The deadline for applications this year is December 15, 1988.)

Book Prizes of the Science Museum & COPUS

The Science Museum of London and the Committee on the Public Understanding of Science (COPUS) have jointly established two Science Book Prizes for the authors considered to have made the greatest contribution to the understanding of science. Two prizes of 1,000 British pounds will be made, one for the best book for younger readers (under 16) and the other aimed at more general readership. The Science Museum has agreed to sponsor the Prizes for an initial period of five years.

Brera Astronomical Observatory

The Brera Astronomical Observatory in Milan has a collection that includes the observatory's records as well as the correspondence of famous eighteenth and nineteenth century astronomers such as Boscovich, Oriani, and Schiaparelli. The extensive archives have been catalogued, in a book, *Inventario di Archivio dell'Osservatorio Astronomico di Brera, 1726-1917*, by A. Mandrino, G. Tagliferri, and P. Tucci. For information write to Professore P. Tucci, Istituto di Fisica Generale Applicata, via Brera, 28, 20121 Milano, Italy.

The Huntington Library

The Huntington Library in San Marino, California has an excellent collection of old scientific books. Henry E. Huntington applied the principle that a first class archive and library can be assembled by combining the libraries of knowledgeable and enthusiastic bibliophiles. The library specializes in British and American history and literature. Over the past nine years, the Huntington Library has attempted to fill gaps in its holdings of the history and philosophy of early science and technology. Huntington explored this area, and among the more than 5,300 incunabula in the library are more than 600 works related to science. Many scientific works have been in this library for a number of years, ranging from early British science (including a long run of the *Philosophical Transactions* of the Royal Society) to the *editio princeps* of many classical scientific works.

The Huntington Library welcomes qualified scholars to work with its collections. Applications for reading privileges should be made to the Reader Services Librarian. Further information on registration procedures, housing arrangements, transportation, and photographic services is contained in the brochure "Information for Readers." The Huntington Library also welcomes applications from scholars for awards to help them carry on significant research in the institution's collections; for details, ask for the leaflet "Research Awards, 1987-1988." Another information leaflet of possible interest is "The Huntington Library as a Research Center for the Study of Early Science and Technology." For further information on the Huntington Library's programs and collections, contact the Reader Services Librarian, Huntington Library, 1151 Oxford Road, San Marino, CA 91108; telephone (818)405-2191.

(An interesting more extensive article on the Huntington Library by Daniel Woodward appears in the Spring 1988 issue of *NEWS of the Beckman Center for the History of Chemistry*.)

TeaCom News

The Commission on Teaching the History of Science of the International Union of the History and Philosophy of Science, Division of History of Science, now issues a circular called *TeaCom News*. Contributions addressing important issues involved in teaching history of science, and requests for placement on the circular's mailing list should be addressed to Alistar M. Duncan, University of Technology, Loughborough, Leicestershire England, LE11 3TU.

UCSD at La Jolla Graduate Program

The University of California, San Diego has announced a graduate program in Science Studies, sponsored by the departments of history, sociology and philosophy, to begin in the fall of 1989. Students will be required to focus

on a particular discipline. The core of the program will be a seminar led by faculty from all three departments. Those interested in history should write to the Graduate Coordinator, Department of History C-004, UCSD, La Jolla, CA 92093. The deadline for applications is January 15th, 1989.

MEETINGS

AAAS Annual Meeting - The 1989 annual meeting will take place in the San Francisco Hilton during January 14-19, 1989. (See coverage of this issue for concurrent APS/DHP meeting.) Sessions of possible interest to members of this Division include:

"Research in Physics Education I: Applications of Research on Conceptual Understanding and Problem Solving"

(Mon/am) - Organized by Fred Goldberg;

"Research in Physics Education II: Applications of Cognitive Science for the Teaching of Physics" (Mon/pm) Organized by John Bruer;

"History of Science I: Forgotten Episodes" (Tue/am) - Organized by John S. Rigden and Judith R. Franz;

"History of Science II: Uneasy Careers and Intimate Lives - Great Women in Science During the Late 1800s and the 1900s" (Tue/pm) - Characteristics and developmental factors of successful women scientists. Organized by Caroline L. Herzenberg and Pnina G. Abir-Am;

"Science Advice to the President: The First 200 Years" (Wed/pm) - Historical perspective on advisory mechanism. Organized by Michael D. Crisp;

"Women in Physics: Why So Few?" (Thu/am) - Organized by William W. Havens Jr.

Sarton Lecture: "The Politics of the Meter Stick" (Tue/1:00 pm) John I. Heilbron - This is a Plenary Session.

Congrès National des Sociétés Savantes: Congrès du Bicentenaire de la Révolution Française - This conference will take place in Paris on April 3-9, 1989; it includes a number of sessions; one is "Science and Technology in France at the time of the Revolution." There will also be a general discussion of changing scientific and technological influences between different European countries between 1780 and 1830. Anyone wishing to attend must register before January 15, 1989; full details and registration forms are available from Martine Francois, Comité des Travaux Historiques et Scientifiques, Ministère de l'Éducation Nationale, 3-5, boulevard Pasteur, 75015 Paris, France.

Fifty Years With Nuclear Fission - This Commemorative Conference will take place April 26-28, 1989 at the National Bureau of Standards, (renamed the National Institute for Standards and Technology) Gaithersburg, Maryland under the auspices of the American Nuclear Society and the National Bureau of Standards; it is co-sponsored

by the American Chemical Society and the American Physical Society. The Honorary Co-Chairmen are J.A. Wheeler and E. Amaldi; the General Co-Chairmen are G.T. Seaborg and E. Segrè; the Committee Chairmen are O.A. Wasson, A.D. Carlson, and J.W. Behrens. The Conference commemorates fifty years of research on the fission process and its application to many areas of science and technology. The conference will feature a recapitulation of progress by outstanding contributors together with presentations of current research and applications. Quite a few of the talks are by famous original researchers, all of whom are over seventy years old. It will be a unique gathering. The address of the conference secretariat is: Jan Hauber, Room B109, Bldg. 245, National Bureau of Standards, Gaithersburg, MD 20899.

History of Science Society - The 1988 Annual Meeting will take place on December 27-30, 1988 at the Westin Hotel in Cincinnati, Ohio. The HSS is meeting jointly with the American Historical Association. There are many sessions that will be of interest to historians of physics; they include: two morning sessions on Wednesday, December 28th, one organized by Craig Fraser and chaired by Thomas L. Hanks, entitled "Studies in the Mathematization of Physics"; another chaired by Stephen G. Brush, entitled "Work in Progress: Astrophysics in the Nineteenth and Twentieth Centuries"; Wednesday afternoon session organized by Lawrence Badash and chaired by Alan D. Beyerchen, commemorating "The Fiftieth Anniversary of Nuclear Fission"; a morning session on Thursday, December 29th, organized by I Bernard Cohen and chaired by Mary Jo Nye, entitled "Electricity in History: A Session in Memory of Bern Dibner"; a Thursday afternoon session organized by Mark Walker and chaired by Paul Forman, entitled "Science and Cultural Imperialism"; two morning sessions on Friday, December 30th, one organized by Robert E. Kohler and chaired by John W. Servos, entitled "Science and Patronage in the Twentieth Century" and the other chaired by P. Thomas Carroll, entitled "Work in Progress: Science and Institutions in Twentieth-Century America." For registration information write to Prof. Alan J. Roche, HSS Registrations, History Department, Case Western Reserve University, Cleveland, OH 44106.

The International Conference of Chinese Scientific and Technological History (CSTH) is scheduled to take place in southeast China's city of Hangzhou on May 5-10, 1989. The conference will concentrate on the Sung and Yuan Dynasties. The Sung Dynasty, the so-called Second Golden Age of China, is a three hundred year period during which ancient scientific and technological development reached its peak. The conference will organize among other things several scientifically-oriented traveling and visiting activities under the general title of "tracing China's South." Applications to attend the conference and requests for further information should be sent to: Li Zihen or Ji Jinghan, Department of International Exchange

Affairs, Hangzhou Association for Science and Technology, No.211, Yan'nan Road Hangzhou, P.R. China

XVIII International Congress of History of Science will take place August 1-9, 1989 in Hamburg and Munich, Federal Republic of Germany. On August 1st, the Congress will open at the Congress Centrum in Hamburg, travel to Munich on August 6th, and reconvene at the Deutsches Museum in Munich on August 7th. The theme of the Congress "Science and Political Order; Wissenschaft und Staat," includes all aspects of the historical relationships between science and the manifestations of secular and nonsecular power in all its various forms. Examples of themes to be discussed are science at courts, academies, universities, and public research institutions; the influence upon or control of science and technology thru state scientific and professional organizations.

The program will include Plenary Sessions, Symposia, Scientific Sections for the presentation of short papers, and Poster Sessions intended as an alternative to the latter. Abstracts and outlines of contributions to Poster Sessions must be submitted by January 31, 1989, and participants must register by this date to benefit from the reduced registrations fee. The Congress Office is ICHS Congress 1989, CPO Hanser Service, Postfach 1221, D2000 Hamburg-Barbütel, FRG; telephone: (40)670 60 51; telefax: (40)670 32 83. The Chairman of the Program Committee is Professor Fritz Krafft, Johannes-Gutenberg-Universität, Mathematik, Staudinger Weg 9, D-6500 Mainz 1, FRG. Invited Speakers and authors of contributed papers may apply for travel grants to attend the Congress. Younger scholars are particularly encouraged to apply. The deadline for receipt of applications for travel grants is January 31st, 1989. These are National Academy of Sciences/National Research Council grants. For information and applications, write to Alexandra K. Wigdor, Principal Staff Officer, National Research Council, U.S. National Committee for the International Union of the History and Philosophy of Science, 2101 Constitution Ave. (GF176), Washington, DC 20418; (202) 334-3026. Please apply as early as possible.

The IAGA 6th Scientific Assembly will take place in Exeter from July 24th to August 4th, 1989. The International Association of Geomagnetism and Aeronomy's Interdivisional Commission on History has announced a call for papers for two 1/2 day sessions. The program for one of the sessions will include two aspects; a) scientific biographies and b) general aspects of the history of geomagnetism and aeronomy. The other 1/2 day session is concerned with problems of uncertainties in geophysical time series. The deadline for the submission of abstracts is March 15, 1989. For information on the conference and the format of the abstracts, write to the convener: W. Schröder, Hechelstrasse 8, D-2820 Bremen-Röennebeck, Federal Republic of Germany.

International School of History of Science - This symposium will take place at Erice-Trapani-Sicily during December 5-10, 1988. In lectures understandable across disciplines, Directors of International Schools and Courses will discuss the past and present of their schools, and then project into the future. Of the 28 international schools represented, 20 of them are in fields of physics. *Participation is by invitation only.* For information please contact Prof. A.I. Miller, Department of Physics, Harvard University, Cambridge, MA 02138, USA Tel: (617) 495 4475.

Gibbs Anniversary Scientific Symposium - Yale University is sponsoring a commemorative scientific symposium on the 150th anniversary of the birth of J. Willard Gibbs during May 15-17, 1989. It is a program of invited speakers; they include: A. Wightman, C.N. Yang, M. Klein, R. Langlands, and P. Samuelson. One of the co-sponsors is the American Physical Society designating it as a Topical Conference. For further information write to Prof. Allan Chodos, Physics Department, Yale University, 260 Whitney Ave., P.O. Box 666, New Haven, CT 06511.

Joule Centenary (1889-1989) - One Hundred Years of Energy - This is an International Conference during July 17-20, 1989 in Salford and Manchester, England. The Conference is being held under the aegis of the **Institute of Physics** and the sponsors include: the Universities of Salford and Manchester, UMIST, Fellowship of Engineers, Inst. of Chemical Engineers, and the Royal Society of Chemistry. (Joule was born in Salford.) The conference program includes a two day symposium on the Life, Times, and Work of J.P. Joule, a session on Joule and Energy in the teaching of science, and visits to Joule's house and to Museums of Science and Industry. Contributions of short papers for the Historical Symposium on "The Life, Times, and Works of J.P. Joule" are still welcome. Details can be obtained from Mrs. R. Williamson, Dept. of Physics, University of Manchester, Manchester M13 9PL, England. Tel: 061 980 7016.

Absorption Spectrometry, Past, Present, and Future - The 40th anniversary of the UV Spectrometry Group will take place at the Royal Museum of Scotland, Edinburgh on November 17-18, 1988. This is a joint meeting held by the UV Spectrometry Group, the Historical Group of the Royal Society of Chemistry, and the National Museums of Scotland. There is a program of invited speakers. Further details can be obtained from Miss A.D. Morrison-Low, Royal Museum of Scotland, Chambers Street, Edinburgh EH1 1JF.

BOOK PUBLISHERS

AAPT

Edited by *Stephen G. Brush* - **History of Physics: Selected Reprints** This collection provides a sampling of

contemporary historical studies of major discoveries and theories in physics from Galileo to Einstein. Beginning with an annotated bibliography of more than 200 publications, it contains 13 articles by leading historians of science on the development of mechanics, optics, electromagnetism, atomic theory, quantum theory, nuclear transmutation, and relativity. Paperback \$16.00; order from the American Association of Physics Teachers Publication Department, 5112 Berwyn Road, College Park, MD 20740.

Academic Press

Nicholas Metropolis, Donald M. Kerr and Gian-Carlo Rota Editors - **New Directions in Physics, The Los Alamos 40th Anniversary Volume** On April 1, 1943, some fifty scientists and engineers gathered in the desert of New Mexico to set up a laboratory for the production of the atomic bomb. It was probably the greatest gathering of intellect of all time. In 1983 many of these outstanding scientists returned to Los Alamos to celebrate the 40th anniversary of the laboratory. This volume contains the proceedings of that meeting. It presents many of the important advances made in physics over the intervening forty years and provides an idea of the possibilities for the future. Write to Academic Press, 1250 Sixth Ave., San Diego, Ca 92101.

AIP - Tomash Series

Laura Fermi - **Atoms in the Family, My Life with Enrico Fermi** The book reveals the personal side of this private man and such associates as Bohr, Teller, Segrè, Bethe, Oppenheimer, Urey, and others. Long out of print, this book received wide praise when originally published in 1954, eventually undergoing numerous reprintings and translation into several languages. The American Institute of Physics has received limited rights to publish only 1,000 copies of **Atoms in the Family**. The price for members of the APS is \$25.60. Write to American Institute of Physics, 335 East 45th Street, New York, NY 10017-3483.

Cambridge University Press

Helge Kragh - **An Introduction to the Historiography of Science** This volume introduces the methodological and philosophical problems with which modern history of science is concerned, and offers a comprehensive review of significant historiographical viewpoints.

Elisabeth Crawford - **The Beginnings of the Nobel Institution The Science Prizes 1901-1915** Crawford describes in detail the story of the intricate inner workings of the process whereby the prizewinners were selected.

D. R. Murdoch - **Niels Bohr's Philosophy of Physics** This book describes the historical background of the physics from which Bohr's ideas grew; it traces the origins of his idea of complementarity, and discusses its meaning and significance. Write to Cambridge University Press, 32 E. 57th St., New York, NY 10022.

Harvard University Press

G. Holton - Thematic Origins of Scientific Thought: Kepler to Einstein, (Revised Edition) - Gerald Holton brings his classic text up-to-date in this newly revised edition, presenting significant new material.

Edward Harrison - Darkness at Night: A Riddle of the Universe This book eloquently describes the misleading trails of inquiry and strange ideas that have abounded in the quest for a solution. In tracing this story of discovery, we encounter the concept of infinite space, the structure and age of the universe, the nature of light, and other subjects that have been so perplexing.

Spencer R. Weart - Nuclear Fear, A History of Images Drawing from the sources of history, sociology, psychology, art, literature, and anthropology, Weart reveals that much of what we believe about nuclear energy is based not on facts alone but on a complex tangle of imagery suffused with emotions and rooted in the distant past.

Paperbacks for course adoption include:

I. Bernard Cohen - Revolution in Science,
Daniel J. Kevles - The Physicists: The History of a Scientific Community in Modern America,
A. P. French and P. J. Kennedy, Editor - Niels Bohr: A Centenary Volume. Write to Harvard University Press, 79 Garden St., Cambridge, MA 02138.

MIT Press

Robert Kargon and Peter Achinstein, Editors - Kelvin's Baltimore Lectures and Modern Theoretical Physics: Historical and Philosophical Perspectives In 1884, Sir William Thomson (later Lord Kelvin) delivered a significant series of lectures on physics at the Johns Hopkins University in Baltimore. The lectures remain important because, through their explicit presentation of the theories and metaphysical assumptions of the Newtonian mechanistic tradition, they illuminate the roots of this century's physics revolution. This book presents the twenty lectures in their original form for the first time, plus ten original essays by well-known historians and philosophers of science, who discuss the physical issues raised in the Baltimore Lectures and developments in theoretical physics since then.

Leo Szilard, Edited by *Helen S. Hawkins, G. Allen Greb and Gertrud Weiss Szilard* Introduction by *Barton J.*

Bernstein, Foreword by *Norman Cousins - Toward A Livable World: Leo Szilard and the Crusade for Nuclear Arms Control* This book documents physicist Leo Szilard's energetic attempts to influence public policy on arms control and disarmament issues, through open political processes, statements, and behind-the-scenes contacts with Washington power sources, as well as a remarkable exercise in personal diplomacy with Nikita Khrushchev. Write to MIT Press, 55 Hayward St., Cambridge, MA 02142.

NASA

Homer E. Newell - Beyond the Atmosphere: Early Years of Space Science.

Alex Roland - Model Research: The National Advisory Committee for Aeronautics, 1915-1958 This is part of a NASA History Series. More information can be obtained by writing to Sylvia Fries, The NASA History Office, Washington, DC 20546.

Pachart Publishing House

Nicholas T. Bobrovnikoff - Astronomy Before the Telescope The work presents a world-wide view of the development of astronomy in various countries with contrasting civilizations (including China and Maya) with emphasis on the interrelationship of its development with other sciences as well as with the political and cultural situations. Volume One: The Earth-Moon System. (History of Astronomy Series, Volume 1).

M. Heller and O. Godart - The Expanding Universe: Lemaitre's Unknown Manuscript A facsimile of an unpublished manuscript intended for the Catholic Encyclopedia of Japan, presents a totality of Lemaitre's cosmology as well as his views on the existence of collapsed systems of stars and on the evolution of the Universe. (History of Astronomy Series, Volume 2)

O. Godart and M. Heller - Cosmology of Lemaitre Written by two cosmologists, one of whom was a friend and a close collaborator of Lemaitre, the book gives English speaking scientists and historians of science a correct picture of what contemporary science owes Lemaitre. (History of Astronomy Series, Volume 3).

Norris S. Hetherington, Illustrations by V. A. Mann - Ancient Astronomy and Civilization Both a text and a reader for science, philosophy, and history students, this book sketches the development of ancient science and philosophy, including interrelationships between science and society, and makes available in English translation generous excerpts from the works of early scholars, especially Plato, Aristotle, and Ptolemy. Maps show the locations of ancient civilizations and diagrams clearly explain technical scientific points. (History of Astronomy Series, Volume 6). Write to Pachart Publishing House, 1130 San Lucas Circle, Tucson, AZ 85704.

Reidel Publishing Company

Alfred Landé, Edited by *A.O. Barut and A. van der Merwe - Selected Scientific Papers of Alfred Landé* Alfred Landé (1888-1975) played a pivotal role in the development of quantum theory between 1914 and the birth of the new quantum theory in 1925. Landé later developed a point of view on quantum mechanics that is in contrast to that of Max Born.

Olivier Costa De Beauregard - Time, The Physical

Magnitude This is part of the Boston Studies in the Philosophy of Science. This book reflects a physicist's interest in the role and nature of time. It includes discussion of the Einstein-Podolsky-Rosen correlation. Write to D. Reidel, 101 Philip Dr., Norwell, MA 02061.

RECENT & FUTURE ARTICLES

American Journal of Physics

December 1987:

"Newton and Comets" by *A. Bork* and

"Resource Letter IQM-2: Foundation of Quantum Mechanics since the Bell Inequalities" by *L. E. Ballentine*.

American Scientist

June 1988:

"Memoirs of a Dissident Scientist" by *Hannes Alfvén*

Australian Physics

November 1987:

"Optics in Australia" by *W. H. Steel*.

European Journal of Physics

1987:

"The Cavendish Laboratory" by *A.B. Pippard*.

1988 No.2 contains:

"The Fermi School in Rome" by *E. Segrè* and

"The Fermi School in the United States" by *A. Wattenberg*

Foundations of Physics

November 1987 contains:

"Erwin Schrödinger and the rise of wave mechanics. I. Schrödinger's scientific work before the creation of wave mechanics" by *J. Mehra*,

"Erwin Schrödinger's views on gravitational physics during his last years at the University of Vienna and some research ensuing from it" by *L. Halpren*.

December 1987 contains:

"Erwin Schrödinger and the rise of wave mechanics. II. The creation of wave mechanics" by *J. Mehra*,

"Convergence and divergence between the ideas of de Broglie and Schrödinger in wave mechanics" by *G. Lochak* and "Schrödinger and the Interpretation of Quantum Mechanics" by *R. Rohrlich*.

January 1988:

"Centenary of the Birth of Erwin Schrödinger; Special issue of invited papers commemorating August 12, 1887."

HSPS

Volume 18, Part 2 contains:

"Four Physicists and the Bomb: The Early Years" by *Barton J. Bernstein*,

"J. J. Thomson's Work on Positive Rays, 1906-1914" by *Isobel Falconer*,

"Weiss' Magnetron: The Sin of Pride or a Venial Mistake" by *Pierre Quédec*, and

"Atomism from Cosmology: Erwin Schrödinger's Work on

Wave Mechanics and Space-Time Structure" by *Alexander Rüger*.

Isis

December 1987:

"Applied History of Science" by *J.L. Heilbron* and Essay Review by *Bernard Barber* on "Little Science, Big Science...and Beyond" by *Derek J. De Solla Price*.

March 1988:

"Henry Cavendish on the Theory of Heat" by *Russell McCormack* and

"Early Seventeenth-Century Atomism: Theory, Epistemology, and the Insufficiency of Experiment" by *Christoph Meinel*.

Kexue Tongbao

October 1987 "A Prehistoric Astronomical Site at Ju County, Shandong" by *Du Shengyun*

Physics Today

August 1988:

"Atomic Spectroscopy and the Beginnings of Theoretical Astrophysics" by *Leo Goldberg* with the help of *Alex Dalgarno*. In this personal retrospective, the author shows how laboratory work on the interaction between matter and radiation unites physics and astronomy and has frequently led to major discoveries in astrophysics.

"Cosmochemistry in the Early Universe" by *Ralph Alpher* and *Robert Herman*. The standard model of the universe's development—the hot Big Bang—accounts for the fossil cosmic abundance of helium.

"Chandrasekhara Venkata Raman" by *A. Jayaraman* and *A. K. Ramdas*. India's "great savant" of science made deep contributions to acoustics, physical optics, magnetism, molecular physics and especially to our understanding of the scattering of light by matter.

September 1988:

"Kramers's Contributions to Statistical Mechanics" by *Max Dresden*. His detailed biography of Kramers was recently published by Springer Verlag. In this article, Dresden describes the remarks and comments scattered in papers by Kramers which laid the conceptual foundations for the theory of phase transitions.

"Physics and Soviet-Western Relations in the 1920's and 1930's" by *Paul R. Josephson*. The isolation the Soviet Union endured as a result of World War I and the Russian Revolution had a profound effect on the country's physicists. Cut off from Western colleagues, with government funding limited, materials in short supply, and publication disrupted, physicists in the USSR organized to rejoin the international scientific community. With the rise of Stalin, however, many of the efforts of the 1920's were undone.

October 1988 is a special issue of *Physics Today* subtitled "Lasers Then and Now". It celebrates the completion of the **Laser History Project**. The project director was *Joan Lisa Bromberg* and the project historian was *Robert W. Seidel*. Bromberg and Seidel are now completing a

book, "The Laser in America," which will be published by the MIT press.

"The Birth of the Laser" by *Joan Lisa Bromberg*. The idea of generating coherent radiation at optical frequencies was conceived in late 1957; by the end of 1960 there were five realizations of the laser idea.

"How the Military Responded to the Laser" by *Robert W. Seidel*. A 'cash and crash' approach and interservice competition led to a premature shift of emphasis from research and exploration to development and scaling up.

Revista Mexicana de Fisica

Vol.32 (suppl. 1) pp.3-48 contains: "On the History of the Theories of Turbulence" by *G. Battimelli*

Science in Context This is a new journal in the field of science studies and the history and philosophy of science. It is devoted to the study of the sciences from the points of view of comparative epistemology and historical sociology of scientific knowledge. It is published twice a year in March and September. The March issues of each year will cover a wide range of selected topics; the September issue will usually be thematic and devoted to a single topic. Articles of interest to physicists in the first volume include: "The Cosmological Application of Impetus Mechanics and the Physical Argument for Copernicanism: Copernicus, Benedetti and Galileo" by *Michael Wolff*, "Duhem's Medieval Cosmology" by *Steven J. Livesey* and "Autobiographical Assessment of his Research (1913)" by *Pierre Duhem*. Potential contributors are encouraged to approach the editors with proposals for special issues. For more information write to Cambridge University Press, 32 East 57th Street, New York, NY 10022.

Solid State Physics (Japan)

December 1987 "Synchrotron Radiation Research in Japan, and World - Memoirs and Perspective. I." by *T. Sasaki* (In Japanese).

GRANTS & FELLOWSHIPS

AIP - Center for the History of Physics

The Center is continuing its program of grants-in-aid for research in the history of modern physics and allied sciences and their social interactions. The program is described on page 51 of this newsletter in the section **AIP-CHP Grants-In-Aid**.

American Council of Learned Societies

Grants-in-Aid are designed to assist scholars with the expenses of specific programs of research in progress. These expenses may include personal travel and maintenance away from home necessary to gain access to materials, research or clerical assistance, and reproduction of

materials. Awards for living expenses at home to relieve the applicant of the necessity of teaching beyond the conventional academic year will be made only in exceptional cases. Grants are not ordinarily made for the purchase of personal computers, books, or other non-expendable materials. Deadline: December 15, 1988, Amount: \$3,000 maximum. Tenure: between May 1, 1989 and May 1, 1990.

Grants for Travel to International Meetings

The ACLS, in cooperation with its constituent societies, administers a program of travel grants, awarded on a competitive basis, to enable scholars in the humanities and humanities-related disciplines to participate in international scholarly meetings outside North America and the Caribbean Islands. Travel grant stipends are expendable for travel only and cannot be applied to per diem expenses. Persons having a major official role in a meeting are eligible to apply, but preference is given to those who are to present scholarly papers. The amount of the awards is \$500-\$1,000. The deadline is March 1, 1989 for meetings from July to December 1989. There are several restrictions on these grants that are too lengthy to include here; therefore, prospective travel grant applicants should obtain more complete information and the appropriate forms from the Travel Grant Office of the American Council of Learned Societies, 228 East 45th Street, New York, NY, 10017-3398.

National Endowment for the Humanities

NEH "Overview of Endowment Programs" is a guide for those who:

- (1) want to know about NEH grant programs;
- (2) are thinking of submitting applications to NEH;
- (3) need to get through to the right NEH office, and
- (4) want information about NEH application deadlines till the end of 1989.

Free copies can be obtained by writing or calling National Endowment for the Humanities, NEH "Overview", Room 409; 1100 Pennsylvania Ave. NW, Washington, DC 20506. Telephone 202-786-0438. (If you mention that you saw the "Overview" announced in the History of Physics Newsletter, they will send you a complimentary copy of "Humanities", NEH's bi-monthly magazine.)

Division of Research Programs - The NEH supports scholarly research through the Division of Research Programs and the Division of Fellowships and Seminars. Projects that require coordinated or collaborative effort involving various combinations of scholars and others are supported through the Division of Research Programs; for most of these projects, the deadlines occur in the summer or early fall. Most research projects carried out by individual scholars and requiring one year or less of support are generally supported through the Division of Fellowships and Seminars. However, projects that include: editions, translations, reference works, and scholarly tools such as

bibliographies, require applications to the Division of Research. If you have any uncertainty regarding into which category your project falls, it is important that you consult with an Endowment staff member as early as possible. The first six programs described below are in the Division of Fellowships and Seminars. Following them, are projects in the Division of General Programs.

NEH Fellowships afford individual scholars, teachers, and other interpreters of the humanities opportunities to undertake study research, or independent work for periods ranging from several weeks to one year.

Fellowships for University Teachers - NEH grants provide support for members of the faculty of Ph.D. granting universities to undertake full-time independent study and research in the humanities. Individuals are eligible applicants. The application deadline is June 1, 1989. Room 316. Tel: 202-786-0466.

Fellowships for College Teachers and Independent Scholars Grants provide support for teachers in two-year, four-year, and five-year colleges and universities that do not grant the Ph.D., and also for independent scholars and writers, to undertake fulltime independent study and research in the humanities. Individual applicants are eligible. Application deadline is June 1, 1989. Room 316. Tel: 202-786-0466.

Travel to Collection Grants - These enable individual scholars to travel to use the research collections of humanities materials in libraries, archives museums, or other repositories. Individual applicants are eligible. The deadline for receipt of applications is January 15, 1989. Write or call: Travel to Collections, room 316. Tel: 202-786-0463.

Summer Seminars for College Teachers - Participants' Grants provide support for teachers in two-year, four-year, and five-year colleges and universities and for others who are qualified to do the work of the seminar and make a contribution to it. Participants attend six- or eight-week summer seminars directed by distinguished scholars at institutions with libraries suitable for advanced study. Individual applicants are eligible. Applications should be submitted to the seminar director before March 1, 1989 for the 1989 seminars. A list of seminar offerings may be obtained from the program. Write or call room 316. Tel: 202-786-0463.

Directors' Grants provide support for scholars of the humanities to direct summer seminars at institutions with libraries suitable for advanced study. Potential directors should apply through their institutions. The application deadline is March 1, 1989 for summer 1990 seminars. For information and application forms for both participants' and directors' grants, write or call: Summer

Seminars for College Teachers, Room 316, Division of Fellowships and Summer Seminars, National Endowment for the Humanities, 1100 Pennsylvania Ave., Washington, DC 20506. Tel: 202-786-0463.

NEH Division of General Programs - This division fosters public understanding and appreciation of the humanities by supporting projects that bring significant insights of scholarly disciplines to general audiences through interpretive exhibitions, radio and television programs, symposia, printed materials and reading and discussion groups.

Humanities Projects in Media - Grants support the planning, writing, or production of television and radio programs in the humanities intended for general audiences. The collaboration of scholars in the humanities with experienced producers, writers, and directors is required. The Endowment is particularly interested in applications for television and radio projects on the lives of historically significant Americans. Eligible applicants are: nonprofit institutions, organizations, and groups including public television and radio stations. The deadline is December 9, 1988. Write or phone room 420. Tel: 202-786-0284.

Humanities Projects in Museums and Historical Organizations - Grants assist museums, historical organizations, and other similar cultural institutions in the planning and implementation of interpretive programs that use cultural and artistic artifacts to convey and interpret the humanities to the general public. Eligible applicants are: museums, historical societies, and other nonprofit organizations and institutions. Application deadlines are December 9, 1988 and June 9, 1989. Write or phone room 420. Tel: 202-786-0284.

National Science Foundation

Postdoctoral Research Fellowships in History of Science - The program announced last year is continuing; it has been merged with previous programs. A new program Studies in Science, Technology, and Society, SSTS, has been created. These programs provide support for historical studies of science. The NSF also has **Professional Development Awards**. Applicants who have received their Ph.D.'s within the last five years are eligible for the postdoctoral fellowships (maximum stipend \$24,000 per year); professional development awards (maximum stipend \$36,000 per year) are available to established scholars or experienced scientists wishing to improve their understanding of science and technology or to improve their STS skills. The new guidelines changed the deadline date to November 15th. You are encouraged to contact the NSF Studies in Science, Technology, and Science Program by calling (202)-357-9894; or write to NSF Postdoctoral Research Fellowships in History and Philosophy

of Science, Room 336, 1800 G Street, N.W., National Science Foundation, Washington, DC 20550.

Projects Involving the History and Philosophy of Science in Elementary and Secondary Education

- The NSF Directorate for Science and Engineering Education, Division of Materials Development, Research, and Informal Science Education has an Instructional Materials Development Program designed to encourage proposals in the history of science. By incorporating elements of the history of science and technology, the program is intended to support efforts which broaden the content of elementary and secondary science and history courses. There is an effort to make science history an integral part of the content of both formal and informal education at the elementary and secondary levels. Typical activities might include: the development of history material to include in existing science courses, the modification of current history courses by incorporating the significance and history of science, math, and technology, and the inclusion of science history in teacher preparation programs and informal science education activities. Inquiries and preliminary proposals should be addressed to: Mary Kohlerman, Program Director Instructional Materials Development Program, National Science Foundation, Room 635 Washington, DC 20550. Tel: 202-357-7066

Another potential source of financial support is **The Division of Teacher Preparation and Enhancement**. Last year their target date for receipt of proposals was April 15th. Information concerning their programs and projects can be obtained from Dr. Florence Fasanelli, Division of Teacher Preparation and Enhancement, National Science Foundation, Washington, DC 20550. Tel: 202-357-7074.

Smithsonian Institution: National Air and Space Museum Fellowships

A. Verville Fellowship - The National Air and Space Museum supports research and education programs in the history of aerospace science and technology. It has established the A. Verville Fellowship in honor of Alfred V. Verville, a noted aviation designer. A competitive nine- to twelve-month fellowship is intended for the analysis of major trends, developments, and accomplishments in aviation or space studies. Candidates are encouraged to pursue a program of research and writing that would support publication of a work that is scholarly in tone and substance, but also is addressed to an audience with broad interests. The fellowship is open to all candidates with demonstrated skills in research and writing. The fellow will work closely with a staff member who has similar interests. Excellent library staff and facilities exist; the Museum's collection contains more than 30,000 books, 9,000 bound periodicals, and 500,000 technical manuals and reports. The library

collection covers history of aviation, space science, and space exploration. The stipend for 12 months is \$25,000. The fellowships may begin between July 1 and October 1. The deadline for applications and proposals is January 15. Requests for application packages should be sent to: A. Verville Fellowship, Office of the Deputy Director, National Air and Space Museum, Smithsonian Institution, Washington, DC 20560.

Guggenheim Fellowship - The National Air and Space Museum, through the support of a fund established by the Daniel and Florence Guggenheim Foundation, has a one year resident fellowship for predoctoral or postdoctoral research. Young scholars interested in historical and scientific research related to aviation and space are encouraged to apply. Minimum academic requirement for the predoctoral position is a bachelor's degree and current enrollment in a graduate program in an accredited college or university. Postdoctoral program applicants preferably should have received their Ph.D. within the past seven years. The fellowship may begin between July 1 and October 1. A stipend of \$12,500 for predoctoral candidates and \$20,000 for postdoctoral candidates will be awarded with limited additional funds for travel. The deadline for submitting the application is January 15th. Requests for the application package should be sent to: Guggenheim Fellowship, Office of the Deputy Director, National Air and Space Museum, Smithsonian Institution, Washington, DC 20560.

Travel Grants to the ICHS - Invited speakers and authors of contributed papers may apply for travel grants to attend the XVIII International Congress of the History of Science in Hamburg and Munich, Federal Republic of Germany, August 1-9, 1989. The deadlines for the receipt of abstracts by the Congress Organizing Committee and for the receipt of travel grant applications are the same date, January 31, 1989. Younger scholars are particularly encouraged to apply. Requests for forms for travel grant applications should be sent to Alexandra K. Wigdor, Principal Staff Officer, National Research Council, U.S. National Committee for the International Union of the History and Philosophy of Science, 2101 Constitution Ave. (GF 176), Washington, DC 20418. Tel: 202-334-3026.

JOBS

AIP - Center for the History of Physics

As reported on page 51 of this issue of HPN, the Center will begin a Project to Study Scientific Collaborations. The Center is seeking to hire project staff, including a project historian and a project archivist. For further information contact Joan Warnow, Center for History of Physics, American Institute of Physics, 335 East 45th Street, New York, NY 10017.

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 Albert Wattenberg, Department of Physics, University of Illinois, 1110 W. Green Street, Urbana, IL 61801.

KOPAL

Kopal, Zdenek, *Of Stars and Men*, 496 pp., Taylor & Francis International Publishers, 1986, Hardcover \$65.

Since the beginning of his professional career in the 1930s, Professor Kopal, as observer, theoretician, popularizer, editor and teacher, has been closely involved with the evolution of astronomy in the 20th century. His autobiography contemplates the history and possible future of his subject and of civilization itself.

QM ELECTRON THEORY OF METALS

Hoddeson, Lillian; Baym, Gordon; Eckert, Michael, *The Development of the Quantum-Mechanical Electron Theory of Metals: 1928-1933*, Rev. of Mod. Phys., 1987, 59, No. 1.

The authors trace the fundamental developments and events, in their intellectual as well as institutional settings, of the emergence of the quantum-mechanical electron theory of metals from 1928 to 1933. This paper continues an earlier study of the first phase of the development devoted to finding the general quantum-mechanical framework. Solid state, by providing a large and ready number of concrete problems, functioned during the period treated here as a target of application for the recently developed quantum mechanics; a rush of interrelated successes by numerous theoretical physicists, including Bethe, Bloch, Heisenberg, Peierls, Landau, Slater, and Wilson, established in these years the network of concepts that structure the modern quantum theory of solids. They focus on three examples: band theory, magnetism, and superconductivity, the former two immediate successes of the quantum theory, the latter a persistent failure in this period. The history revolves in large part around the theoretical physics institutes of the Universities of Munich, under Sommerfeld, Leipzig under Heisenberg, and the Eidgenössische Technische Hochschule (ETH)

in Zurich under Pauli. The year 1933 marked both a climax and a transition; as the laying of the foundations reached a temporary conclusion, attention began to shift from general formulations to computation of the properties of particular solids.

BLACK-BODY RADIATION AND DISCONTINUITY

Kuhn, Thomas S. *Black-body Theory and the Quantum Discontinuity, 1894-1912*. With a new Afterword. xx+378 pp., Chicago: University of Chicago Press, 1987, Paper \$18.95.

Kuhn traces the emergence of a discontinuous physics during the early years of this century. Breaking with historiographic tradition, he believes that, though clearly due to Max Planck, the concept of discontinuous energy change does not originate in his work. Instead, it was introduced by physicists trying to understand the success of his brilliant new theory of black-body radiation. In an Afterword to this edition, Kuhn summarizes the book's principal themes and discusses their relations to the view of scientific development presented in his book *The Structure of Scientific Revolutions*.

PHOTOGRAPHS OF PHYSICISTS

Cline, Barbara Lovett, *Men Who Made a New Physics: Physicists and the Quantum Theory*. With a new Foreword by Silvan S. Schweber. xiv, 274 pp., 20 photographs, 3 line drawings. Chicago: University of Chicago Press, 1987.

In a style meant for students and general readers, Cline traces the development of the quantum theory, capturing the atmosphere of argument and discovery among atomic physicists in the 1920s. She explores the backgrounds of the major figures-Rutherford, Bohr, Planck, Einstein-separately, but draws them together as they began to consider each other's

questions. Vignettes show "how" these scientists worked, from the solitary Planck to the gregarious Rutherford. Cline uses a fictional dialogue between two physicists to present an overview of modern quantum theory, then continues her history with accounts of quantum mechanics and relativity. Photographs of the physicists at work appear throughout the book.

DEVELOPMENT OF DISCIPLINES

Schröder, Wilfried, *Disciplinary History as Scientific Self-Reflection of Historical Investigations of Science*, 86pp., figures, tables, references, Bern/Switzerland: Peter Lang Verlag, 1987, \$14.

As part of historiography of individual scientific disciplines, the author provides a history of the development of geophysics and meteorology. Features such as the origin and development of geophysics and meteorology as independent disciplines, the talks and programs decisive for these disciplines and the investigators who promoted these disciplines are examined. These specific features are then used to formulate general rules of the history of the development of scientific disciplines and general principles of the history of science. In view of the fact that both disciplines are concerned particularly with providing measurements, the history of observations on the aurora and noctilucous clouds is reviewed and the sources of data on their phenomena, beginning with the 18th century and the scientists and institutions involved in their investigations are noted. Scientific biographies of individuals important in the historical development of geophysics and meteorology, research programs and their role in the discipline development and scientific journals as an indicator of the development of these scientific disciplines are reviewed. The course of the development of disciplinary history in general is surveyed.

Publisher's address: Peter Lang Verlag, Jupiterstrasse 15, CH-3012, Bern.

ELEMENTARY PARTICLES

Ne'eman, Yuval; Kirsh, Yoram, *The Particle Hunters*, 269 pp., New York: Cambridge University Press, 1986, Paperback \$12.00.

The book gives a non-technical account of the history of the search for the fundamental building blocks of matter, from the point of view of a physicist who played an active role in the development of the field. Beginning with the experiments of Thomson and Rutherford at the turn of the century, the book chronicles how physicists revealed layer upon layer in the world of elementary particles, up to the recent discoveries of the heavy quarks, the tau lepton and the W and Z intermediate vector bosons. The basic technology of accelerators and colliders is also described along with the principles of methods for detecting particles.

MAGNETIC INFLUENCE

Brooks, R. C., *Magnetic Influence on Chronometers, 1798-1834: a Case Study.*, Ann. Sci., 1987, 44, 3, p. 245-64.

The author examines the investigations carried out between 1798 and 1834 to determine whether, and how, magnetism affected the rate at which marine chronometers gained or lost time. There were persistent claims that chronometers systematically altered rate between those determined on land and those at sea, and magnetism was thought by some to be the most likely cause. Others disputed any rate difference at all. The experiments carried out to determine if there was a difference between land and sea rates of chronometers are considered.

EINSTEIN AND QUANTUM THEORY

Fine, Arthur, *The Shaky Game: Einstein, Realism and the Quantum Theory*. xi+186p. Chicago: The University of Chicago Press, 1986. \$25.00.

"They are playing a risky game with reality." Thus did Einstein express his reservations about the quantum theory. Using unpublished archival material to illuminate Einstein's public writings, the first half of this book traces the history of Einstein's concerns over the quantum theory, concentrating on a variety of issues, including Einstein's statistical interpretation, his own version of the EPR and

"cat" paradoxes, his understanding of local causality and his special kind of realism. That discussion provides a bridge to a general assessment of the current philosophical debate over realism and antirealism, where the author finds fault with both camps suggesting instead that one try an attitude toward science that ties philosophical reflection more tightly to ongoing scientific practice. This attitude is displayed in the final chapter, which shows how one might still maintain a realist interpretation of the quantum theory, even in the face of Bell's theorem, but asks whether that game is any longer worth playing.

NUCLEAR ASTROPHYSICS

Mathai, A.M. and Haubold, H.J., *Modern Problems in Nuclear and Neutrino Astrophysics*, 75 pp., Berlin: Akademie-Verlag, 1987.

Nuclear and neutrino astrophysics are two branches of modern astronomy dealing with the synthesis of atomic nuclei and neutrinos generated by it in the universe. In the booklet analytic methods are developed for constructing simple models for the stellar nuclear energy generation and neutrino emission, respectively. The mathematical and physical foundations of nuclear reaction rates are considered in detail, also from the scientific-historical point of view. The booklet contains three chapters: I-The theory of nuclear energy generation of solar type stars—a historical sketch, II-Mathematical approaches to nuclear astrophysics, III-The mathematical approach to the solar neutrino problem. For copies (and additional papers) write to H.J. Haubold, Central Institute for Astrophysics, DDR-1591 Potsdam-Babelsberg, German Democratic Republic.

BOHR'S DISCUSSIONS

Mehra, J., *Niels Bohr's Discussions with Albert Einstein, Werner Heisenberg, and Erwin Schrödinger: The Origins of the Principles of Uncertainty and Complementarity*. Found. Phys., 1987, 17, 5, p.461-506.

In this paper, the main outlines of the discussions between Niels Bohr and Albert Einstein, Werner Heisenberg, and Erwin Schrödinger during 1920-1927 are treated. From the formulation of quantum mechanics in 1925-1926 and wave mechanics in 1926, there emerged Born's statistical interpretation of the wave function in summer 1926, and on the basis of

the quantum mechanical transformation theory—formulated in fall 1926 by Dirac, London, and Jordan-Heisenberg formulated the uncertainty principle in early 1927. At the Volta Conference in Como in September 1927 and at the fifth Solvay Conference in Brussels the following month. Bohr publicly enunciated his complementarity principle, which had been developing in his mind for several years. The Bohr-Einstein discussions about the consistency and completeness of quantum mechanics and of physical theory as such—formally begun in October 1927 at the fifth Solvay Conference and carried on at the sixth Solvay Conference in October 1930—were continued during the next decades. All these aspects are briefly summarized.

PHILOSOPHY OF SCIENCE

Harrison, W. A., *Accommodation of Seemingly Antithetical Views, a Novel Theoretical Tool.*, Comments Condensed Matter Physics, 1987, 13, 4, p.207-321.

A fact familiar to physicists is that frequently two apparently contradictory views turn out to be correct. This fact can be used as a way of stating many physical laws or even as the basis of quantum theory itself. It has also been used to derive a variety of explicit formulae in condensed matter physics. Thus the author shows how accommodation of two views of the electronic structure of semiconductors led to the prediction that interatomic couplings should vary with distance d and h squared and m times d squared; it even gave geometric expressions for the coefficients. Similar applications have made detailed testable predictions of many other aspects of electronic structure in solids. When the two views are sufficiently different, the accommodation of one to the validity of the other places very stringent conditions on both.

ALVAREZ

Alvarez, Luis W., *Alvarez*, xii+292 pp., New York: Basic Books, 1987.

In an autobiography as rich and lively as his remarkable life, he now recounts his wide-ranging adventures with candor and power. Alvarez witnessed the dawn of the Atomic Age at both Los Alamos and Hiroshima, where he was one of the few physicists to accompany the Enola Gay on its epoch-making mission. His work for international understanding has taken him on historic visits to Russia and China,

while his quest for scientific understanding has taken him from the basic structure of matter to his controversial new cosmic collision hypothesis to explain the sudden extinction of the dinosaurs sixty-five million years ago. This fascinating work has led to a new approach to evolutionary studies and inspired the concept of "nuclear winter." As history, as science, as human drama, the life of Luis Alvarez is a grand adventure.

THEORIES OF THE MOON

Brush, Stephen G., *Early History of Selenogony, Origin of the Moon*, 1986, Ed. W. K. Hartmann et al., Houston, Lunar and Planetary Institute.

Modern theories of the origin of the Moon developed from general schemes for the origin of the solar system and also from detailed analyses of the "secular acceleration" of the Moon. After William Ferrel and C. E. Delaunay had suggested that tidal forces slow the Earth's rotation so that the Moon is actually moving more slowly in her orbit, G. H. Darwin extrapolated the history of the lunar orbit back to a time when the Moon was very close to the Earth. He proposed in 1878 that fission of a previous proto-Earth had been triggered by the sun's action in resonance with free oscillations. The hypothesis that the Pacific Ocean basin is the scar left by the Moon's departure from Earth was added by Osmond Fisher. Alternative selenogonies were proposed by Edouard Roche (condensation from a circumterrestrial ring) and Thomas J. J. See (capture after formation in the outer solar system). Darwin's fission theory was rejected following criticism by Harold Jeffreys in 1930.

LOS ALAMOS 40th ANNIVERSARY

Metropolis, N., Kerr, Donald M., and Rota, Gian-Carlo (eds.), *New Directions in Physics, the Los Alamos 40th Anniversary Volume*, xii + 292 pp. Cambridge, Mass.: Academic Press, 1987.

Wartime scientists returned to Los Alamos to commemorate the 40th anniversary of the founding of the Laboratory in 1943. An appropriate form for the gathering was a conference of serious science in which speakers described their research efforts since World War II; shorter contributions were made by session chairmen. This forum was deemed the best expression of a legacy for succeeding generations of scientists.

Eight of the reports are by Nobel laureates, all awards made since 1943. The list of authors is distinguished. From the Preface: "Their contributions, now collected in this volume, betoken Los Alamos's role as a cradle of scientific talent."

JOHANNES STARK

Stark, Johannes, *Erinnerungen eines Deutschen Naturforschers*, herausgegeben von Andreas Kleinert. x + 153 pp., Mannheim: Bionomica-Verlag, 1987.

Johannes Stark, the Nobel laureate in physics of 1919, was the strongest supporter of the so called Aryan physics movement which rejected modern theoretical physics for ideological reasons and introduced racism into physics. When the American Army entered Bavaria in 1945, Stark was imprisoned for several weeks in the town of Traunstein where he was spending his old age. During this time, he wrote his recollections. The manuscript was saved by his family and has now been published for the first time. It contains a detailed description of Stark's scientific career, including the history of his discovery of the splitting of spectral lines in an electric field. The second part of the book is entitled *Political Recollections*. It gives a rather subjective account of Stark's political activities during the Weimar period and the Third Reich. In the last years of the war, Stark was involved in controversies with local Nazi authorities, and in 1944 he even withdrew from the Nazi party.

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DISCOVERY OF THE NEUTRON

Six, Jules, *La Decouverte du Neutron (1920-1936)*, Editions du CNRS (1987), Presses du CNRS, 20-22 rue Saint Amand 75015 Paris; 110FF

"The neutron": who had first the idea, who discovered it, who established its main properties? To these apparently simple questions, multiple answers exist. The progressive discovery of the neutron is a marvellous illustration of some characteristics of scientific research, where the unforeseen may be combined with the expected. This discovery is placed in the context of the 1930's scientific effervescence that succeeded the revolutionary introduction of quantum mechanics. This

book describes the works of Bothe, of Joliot-Curie and Chadwick which led to the neutron in an unexpected way. A historical analysis allows a new interpretation of the hypothesis suggested by Joliot-Curie. Some texts from these days will help the reader revive this fascinating story.

SPECTRAL SERIES OF HYDROGEN

King, Jacqueline E. and Hey, John D., *The Various Spectral Series of Atomic Hydrogen*, South African Journal of Science, 1987, vol. 83, pp. 705-712.

The discovery of the various spectral series of hydrogen over a period of more than a century of intense activity in atomic spectroscopy, is described and discussed. Termination of a spectral series occurs because of pressure-dependent ionization, and pressure broadening. The important work of Saha as well as that of Inglis and Teller on these problems is examined in some detail.

RUTHERFORD

Wilson, David, *RUTHERFORD, Simple Genius*, 638 pp., Cambridge: MIT Press, 1984.

Ernest Rutherford was the greatest experimental physicist of the early twentieth century. Born in New Zealand in 1871, educated at Christchurch, New Zealand and Cambridge University, he died in 1937 as Lord Rutherford of Nelson and was buried in Westminster Abbey. He was Professor of Physics at McGill, Manchester, and finally at the Cavendish Laboratory in Cambridge, yet his Nobel Prize (1908) was for Chemistry. Rutherford's scientific achievements - the explanation of radioactivity, the discovery of the nuclear structure of the atom, the "splitting of the atom" etc. are all covered with particular reference to his working methods as shown in his laboratory notebooks. New material discovered by the author is used to develop a description of Rutherford's previously undescribed work on submarine detection during the First World War. There is also a detailed account from previously unobtainable material of the detention in Russia of Peter Kapitsa and Rutherford's dealings with the Soviet Government. Finally Rutherford is described in his institutional role, in his relationship with Government science and "Big Science" and in his extensive international connection with British Empire and U.S. Universities.

HISTORY OF PHYSICS NEWSLETTER

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