History of Physics Newsletter

Volume II, Number 5 September, 1986

DIVISION NEWS

APS MEETINGS

The Division of History of Physics will sponsor four sessions at the following APS meetings in 1987.

San Francisco, CA "The Life and Legacy of Robert Oppenheimer"
January 28-30, 1987. This is a joint session with the AAPT which is being organized by J. Rigden and R. Stuewer. The plan is to divide the subject chronologically:
BERKELEY PHYSICS IN THE 1930s - *John L. Heilbron*
THE WAR YEARS - *Robert R. Wilson*
THE SCIENTIST AND THE STATE - *Daniel J. Kevles*
THE POST WAR YEARS - *Robert F. Bacher*

New York, NY "Superconductivity: A Thirtieth Anniversary Celebration"
March 16-20, 1987. The session is being organized by G. Baym and S. Weart. The invited speakers are: *Philip W. Anderson, Gordon Baym, Per F. Dahl, and J. Robert Schreiffer.*

Crystal City, VA "The History of Astrophysics in the 20th Century"
April 20-23, 1987. Jointly sponsored with the Astrophysics Division. The session is being organized by M. Harwit.

The subject of the Tuesday morning, April 21st, 1987, session is **"Stellar Structure and the Origin of the Stellar System."** - The invited speakers are: *L. Badash, K. Hufbauer, S. Chandrasekhar, H. Bethe, E. Salpeter, and R. Davis.*

The subject of the Wednesday morning, April 22nd, 1987, session is **"Stellar Composition, Birth of the Universe, and Origin of the Elements."** - The invited speakers are: *D. DeVorkin, R. Smith, R. Alpher, R. Herman, W. Fowler, and R. W. Wilson.* The titles of the talks will be announced in the APS bulletin and the next History of Physics Newsletter. For further information contact the chair of the program committee, Martin Harwit of Cornell.

(Note: During the three days following the above sessions, April 23 to 25, 1987, the University of Maryland and the Smithsonian Institution are sponsoring **A Symposium on the 300th Anniversary of Newton's Principia.** See the later section "Meetings.")

NOMINATIONS FOR OFFICERS

The Nominating Committee for the 1987 election consists of Allan Needell (Chair), Stephen Brush, and John Rigden. Nominations for Vice-Chairperson (to become Chairperson in 1988) and for two persons to serve 3 year terms on the Executive committee should be sent by November 15th to Allan Needell, National Air and Space Museum, Room 3561, Smithsonian Institution, Washington, DC 20560. Division Members, eligible for nomination are listed in the most recent APS membership directory.

ELECTION RESULTS

Roger H. Stuewer has been elected Vice-Chairperson of the Division of History of Physics for 1986. He will serve as Chairperson in 1987. He is Professor of History of Science and Technology at the University of Minnesota with faculty appointments in: the School of Physics and Astronomy, Minnesota Center for Philosophy of Science, and American Studies Program. He received his Ph.D. from the University of Wisconsin in 1968 and has been at Minnesota since 1967. Other appointments at Boston University, 1971-72; Harvard University, 1974-75; Deutsches Museum, Munich, 1981-82. Fellow, American Council of Learned Societies, 1974-75, 1983-84; Gesellschaft fuer Wissenschaftsgeschichte, 1983, AAAS, 1983. Secretary, History of Science Society, 1972-78; Editor, AAPT/ AJP Resource Letters, 1978-present; Member and Chairman, AIP Committee on the History of Physics, 1978-present; Executive Committee, APS Division of History of Physics, 1982-85. Author of "The Compton Effect: Turning Point in Physics" (1975); editor of "Historical and Philosophical Perspectives of Science" (1970) and "Nuclear Physics in Retrospect" (1979); co-editor of "Springs of Scientific Creativity" (1983). Research interests include history of radiation theory, quantum mechanics and nuclear physics.

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 may subscribe at $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 *Robert D. Sard,* University of Illinois, Urbana, IL 61801.

(Election Results continued)

Stephen G. Brush has been elected Divisional Councilor to serve thru December 1989. He is Professor in the Institute for Physical Science and Technology and the Department of History at the University of Maryland. He received his D. Phil. from Oxford in 1958. After a year at Imperial College London he was employed from 1959 to 1965 as a physicist at Lawrence Livermore Laboratory, where he published papers on the properties of matter at high pressures and temperatures and on the history of the kinetic theory of gases. In 1965 he went to Harvard to help develop the Project Physics Course. Since 1968 he has been at Maryland as a historian of science. His book "The Kind of Motion We Call Heat: A History of the Kinetic Theory of Gases in the 19th Century" won the Pfizer Award for the best American book on history of science published in 1976. His current research is on theories of the origin and structure of the solar system in the 19th and 20th centuries. Brush served as the first Secretary-Treasurer of the Division of History of Physics and as founding editor of its "History of Physics Newsletter."

The Division elected **Peter Galison** and **Sallie A. Watkins** to serve three year terms on the executive committee.

Peter Galison is an Associate Professor in the Department of Philosophy and an Associate Professor by courtesy in the Department of Physics at Stanford University. He received his Ph.D. in Physics (Theoretical Particle Physics) and in History of Science (History of 20th Century Experimental Physics) from Harvard University. He was a Junior Fellow in the Society of Fellows at Harvard University from 1980 to 1983. His theoretical high energy physics work has focused on model building and phenomenology in the weak interactions. He has a number of published articles concerned with both experimental and theoretical topics in 20th Century Physics. He is working on a book "Image and Logic: Two Traditions in Twentieth Century Experimental Physics"

Sallie A. Watkins is Dean of the College of Science and Mathematics, and Professor of Physics at the University of Southern Colorado. She received her Ph.D, from Catholic University of America. Member: History of Science Society, History and Philosophy of Science Section, American Association for the Advancement of Science (Vice-Chairman, 1982; Chairman, 1983). Chair, new committee on the History and Philosophy of Physics; American Association of Physics Teachers. Her current research subject is Lise Meitner.

Other members of the Executive Committee are: Chairperson, **Martin Harwit**; Past Chairperson, **Robert E. Schofield**; Secretary-Treasurer, **Albert Wattenberg**; Members with terms expiring in April 1987, **Paul Forman** and **M. Norton Wise**; Members with terms expiring in April 1988 **Gordon Baym** and **Allan A. Needell**; ex officio, Director of the Center for History of Physics, **Spencer Weart**

SOLICITATION

to Division Members interested in:
Giving Papers at Sessions Organized by the Division or Serving on the Division's Executive Committee.

The Division of History of Physics is interested in identifying members who would like to play an active role in Division affairs. We would appreciate hearing from you if you would like to help organize Division activities. These could include: fund raising; arranging for special invited sessions, as well as sessions for contributed papers at APS meetings, and similar activities. We also would like to hear whether you would be interested in giving an historical paper at any of the Society's meetings. In responding, it would be particularly useful if you could provide information on your historical interests, possibly including a *vitae* listing anything historical you might have published. Specifically we would be interested in your:

1. Name, address and telephone number
2. Institutional affiliation if any
3. General area of historical interest
4. Ways in which you might like to contribute to Division

activities
5. Recent publications of interest (please list no more than a maximum of five).

Write to the Chairperson of Division of History of Physics, Professor Martin Harwit, Department of Astronomy, Space Science Building, Cornell University, Ithaca, NY 14853-0352.

EXECUTIVE COMMITTEE

The Executive Committee of the Division held its annual meeting on May 1, 1986 in Washington, D.C. The following business was transacted.

1. Report on results of election (see above).

2. Possible ways to improve the committee's knowledge of who are potentially active members was discussed. One way proposed was that the chairperson make an announcement in the Newsletter. (See above Solicitation).

3. M. Harwit is planning on having four sessions of invited papers at general APS meetings in 1987. (See above APS MEETINGS).

4. At the time that the By-Laws of the Division were approved, the clause was omitted which contains the duties and responsibilities of the Divisional Councillor. In order to rectify the omission, the Executive Committee is submitting to the membership for their approval the following.

Amendment to the By-Laws

"V.7 The Divisional Councillor shall serve as liaison between the Council of the Society and the Executive Committee of the Division. The Division Councillor shall report to the Executive Committee at the earliest possible time regarding council actions that affect the status and operation of the Division."

(The proposed amendment to the By-Laws was read at the annual business meeting of the Division. No objections were raised).

A ballot for approval or rejection of the amendment to the By-Laws will be included at the time of the next election of Divisional Officers. An amendment requires the approval of not fewer than two thirds of the members voting. If the membership approves the amendment, it will then be sent to the APS council for their approval.

(Note: If there are substantive objections to this amendment, please inform the Secretary-Treasurer of the Division, A. Wattenberg, 1110 W. Green St., Urbana, IL 61801)

5. Book Award: (See HPN, September, 1985, page 35). The Executive Secretary of the APS, W. W. Havens, informed the Division that the Book Award proposed by the Division of History of Physics would be given final approval when the money is available for at least five awards. The chairperson of the Division, Martin Harwit, is exploring possible sources of funds. He would appreciate suggestions of both sources and people who could be helpful in this regard.

6. Rita Lerner of the AIP reported on recent publications of interest to the DHP: **The History of Modern Physics** edited by *Spencer Weart and Melba Phillips* is an AIP publication. The most recent book published by Tomash under agreement with the AIP is **Physics for a New Century: Papers presented at the 1904 St. Louis Congress** compiled by *Katharine R. Sopka.* The series also includes: **Alsos** by *Sam Goudsmit*
Project Y: The Los Alamos Story by *D. Hawkins, E. C. Truslaw, and R. C. Smith*
American Physics in Transition: A History of Conceptual Change in the Late Nineteenth Century by *A. E. Moyer*
The Question of the Atom: From the Kahlsruhe Congress to the first Solvay Congress by *Mary Jo Nye.*

COMMITTEE APPOINTMENTS

The appointed Committees of the Division for 1986-1987 are:

- Nominating Committee - see cover, page 65
- Fellowship Committee: S. Brush (Chair), G. Baym, W. Fowler, M. Klein and G. Lubkin
- Program Committee: M. Harwit (Chair), G. Baym, J. Rigden, R. Stuewer, and S. Weart.

RENEWAL TIME

This is the last issue of volume II of HPN. Subscribers, whose subscriptions started with volume II number 1 and who are not members of the Division, should use the form on the inside back cover to order volume III.

AIP and APS NEWS

AGU joins AIP The American Geophysical Union has become a member society of the American Institute of Physics. This is giving the AIP - Center for the History of Physics added impetus to devote efforts to preserve and make known the history of geophysics. The Center has already been aiding an innovative project begun last year by historian William Glen. A report on his work is in the CHP Newsletter of May 1986.

The AGU has had a Committee for the History of Geophysics (CHG) since 1982. It maintains a history editor for *EOS*, the weekly publication of the AGU. A newsletter **The History of Geophysics** is published by the CHG. The newsletter includes: news, anouncements, information, reports on meetings and history talks at AGU meetings. As well as the above, there is a Forum Seection for opinions relating to historical matters, and also sections called Features and Miscellanea. In the May 1986 issue the Feature was "Doing Oral History" by *Leon Gortler*. There was an interesting note on "Kepler on Astrology". For more information write to the newsletter editor, Sam Silverman, 18 Ingleside Road, Lexington, MA 02173.

Pi-NET
The Physics Information Network is offered free of charge as a one year pilot program. Selected AIP and APS information, including most of the contents of the Center for the History of Physics Newsletter, is now available in advance of other forms of publication to anyone in North America with a computer modem.

Pi-NET information includes physics-related job opportunities, a calendar of meetings, advance abstracts and titles of articles, and news releases. Brief items concerning the history of physics will be found in the announcement category. To use the service : (1) call 1-800-336-0437 to obtain your local GTE Telenet number; (2) dial your local Telenet number from your computer; (3) when you hear the high-pitched tone, press ENTER twice; (4) when telenet announces itself and displays TERMINAL=, type D1 and press ENTER; (5) at the @ prompt, type in 516617 for 1200 baud; press ENTER. Telenet will display 516617 CONNECTED; press ENTER again. (6) Pi-NET will announce itself. To register type (*) and press ENTER. (7) The instructions are then reasonably easy to follow.

APS - New Locations for The Archive for the History of Quantum Physics - Roger H. Stuewer, acting as Chairman of the AIP Committee on the History of Physics, requested the APS Council to approve that copies of the Archive for the History of Quantum Physics be located at the Universidad Autonoma de Madrid, the University of Melbourne, the Parc de Villette in Paris, and Harvard University. They will serve as Libraries of Deposit and will make the archives available to scholars conducting research in the history of modern physics. Eric Rudinger, on behalf of the Niels Bohr Archive in Copenhagen, has given permission for a copy of the Bohr Scientific Correspondence and Manuscripts to be placed in each of these Libraries. The APS Council unanimously approved the request at its meeting on 27 April 1986.

Copies of the Archive for the History of Quantum Physics were originally located at the Bohr Institute in Copenhagen, the University of California in Berkeley, and the American Philosophical Society in Philadelphia. Since then six additional institutions have become Libraries of Deposit for the Archive: the AIP center for the History of Physics in New York, the University of Minnesota in Minneapolis, the Accademia Nazionale della Scienze in Rome, the Science Museum in London, the Deutsches Museum in Munich, and the Hebrew University in Jerusalem.

APS Special Book Publication:
***Edward Hill*- My Daughter Beatrice - A Personal Memoir of Dr. Beatrice Tinsley, Astronomer.**

The APS is publishing this book as a special project of the APS Committee on the Status of Women in Physics. It is a popular level book intended for general readers about Beatrice Hill Tinsley (1941-1981) who was a brilliant astrophysicist and professor of Astronomy at Yale. The Introduction and Obituary by astronomers put her life and personal contributions into the context of her scientific achievements. In her tragically brief career, Prof. Tinsley revolutionized the study of the evolution of galaxies. She was famous among astronomers for her prodigious creativity. The book will be of interest in the history of physics because of the extensive quotes it contains from Dr. Tinsley's letters to her father, beginning from age seven to just before her death. These contain an usually articulate and candid description of the education and work of an astrophysicist in the 60's and 70's, - and of a woman scientist in particular. Write to: Tinsley Book, Department HD, American Physical Society, 335 East 45th Street, New York, NY 10017-3483.

MEETINGS

AAAS 1987 - The session in Chicago on February 14th, 1987, will include a symposium on the participation of women in science since antiquity. Speakers will include: Margaret Alic of the Oregon Graduate Center, who will give an overview of the history of women in science; Caroline Herzberg of Argonne National Laboratory, who will present an examination of the participation of women in science as a function of time; Susan Meschel of the University of Chicago, who will speak on Jewish women in science; Anne Koblitz of Wellesley College, who will

speak on early Russian women scientists, and Patricia Kentschaft of Montclair State College, who will speak on black women in mathematics. For further details contact Caroline Herzberg, Applied Physics Division, building 362, Argonne National Laboratory, Argonne, IL 60439.

British Society for the History of Science - The summer meeting in London during July 1987 will be on "THE LIFE, WORK, AND MILIEU OF ROBERT HOOKE". Anyone who would like to offer a paper on a relevant topic should write as soon as possible to Michael Hunter, Department of History, Birkbeck College, University of London, Malet St., London WC1E 7HX, or Simon Schaffer, Department of History and Philosophy of Science, University of Cambridge, Free School Lane, Cambridge, CB2 3RH, England.

History of Science Society 1986 - The annual meeting will take place at The Pittsburgh Hilton, Pittsburgh, PA on 23-26 October 1986. Two simultaneous sessions on Friday morning will have reports of interest to Historians of Physics by Howard Margolis, Maurice A. Finocchiaro, Erman McMullin, Norton Wise, and Peter Galison. A Friday afternoon session on "Experiment, Observation, and Theory Formation in Twentieth-Century Science" was organized by Roger H. Stuewer. The speakers are: Gerald Holton, John Rigden, Silvan S. Schweber, and Woodruff T. Sullivan,III. On Saturday afternoon the History of Science Society Lecture will be given by John Heilbron; the title is Applied History of Science. For further information contact Peter Machamer, Department of History and Philosophy of Science, 1017 Cathedral of Learning, University of Pittsburgh, Pittsburgh, PA 15260.

History of Science Society 1987 - The annual meeting will be held from October 29th to November 1st, 1987 in Raleigh, North Carolina. The Program Committee invites proposals for papers and suggestions for sessions. Please address correspondence to Michael M. Sokal, Department of Humanities, Worcester Polytechnic Institute, Worcester, MA 01609 or John W. Servos, Department of History, Box 1783, Amherst College, Amherst, MA 01002. Proposals should be received no later than 1 February 1987.

Imperial College - Schroedinger Centenary Conference - The Imperial College in association with the Austrian Institute of London is organizing the Schroedinger Centenary Conference to be held Tuesday, March 31st to Friday, April 3rd, 1987. This major international gathering will cover those areas of science and philosophy associated with Schroedinger under the titles: Biographical, Cosmology, Wave Mechanics, Statistical Mechanics, Unified Theories of Fundamental Forces, Chemistry, and Molecular Biology. Invited plenary lectures will be delivered and contributed papers will be presented in poster sessions. Those who are interested should write as soon as possible to: Secretary, Schroedinger Centenary Conference - Room 637,Huxley Building - Imperial College, London SW7 2BZ England.

International Society for Eighteenth Century Studies - ISECS will hold its next quadrennial Enlightenment Congress in Budapest, July 26th to August 2nd 1987. Information is available from the Organizing Committee , Dr. Istvan Toth, Secretary Institute of Historical Sciences of the Hungarian Academy of Sciences, P.O.B. 9, 1250 Budapest, Hungary.

International Union of Geodesy and Geophysics - The General Assembly will be held in Vancouver, Canada during August 1987. There is a CALL FOR PAPERS for two sessions:
"PAST, PRESENT, AND FUTURE TRENDS IN RESEARCH IN AERONOMY AND GEOMAGNETISM" - The purpose of the interdivisional history commission is to encourage the study of the factors influencing geophysics and the analysis of the historical data. The session seeks to deal with the many historical events and leading scientists that have contributed to the international studies in aeronomy, auroral physics, geomagnetism and related disciplines (e.g. physics). Papers may cover the people, the research program, the institutions, and their influence on the different disciplines in the geosciences.
"USE OF HISTORICAL DATA IN GEOSCIENCES" - The session deals with the study and preservation of historical data in the different geophysical disciplines.

The papers will be published in a book. Abstracts should be sent before February 15, 1987 to Dr. W. Schroder, Hechelstrasse 8, D-2820 Bremen-Ronnebeck, Fed. Rep. of Germany.

The University of Maryland and the Smithsonian Institution - Newton's Principia 1687-1987 - The two institutions have arranged a symposium to commemorate the 300th anniversary of *Newton's Principia.* It will be held at the University of Maryland, College Park and the Smithsonian Institution, Washington D.C. from 23-25 April 1987.
Thursday, April 23
Morning session title: NEWTON AND HIS ACHIEVEMENT - The speakers are *Richard Westfall,* Indiana University and *Betty Jo Dobbs,* Northwestern University.
Afternoon session title: NEWTON AND THE CLIMATE OF HIS AGE - The speakers are: *James Mcguire,* University of Pittsburgh and *Simon Schaffer,* Cambridge University.
Friday, April 24

Morning session title: RESEARCH SEMINAR - The seminar will include six to eight contributed technical papers with an emphasis on the PRINCIPIA and its impact on the 18th century.
Afternoon session title: THE PRINCIPIA - The speakers are: *I. Bernard Cohen,* Harvard University, *Barbara M. Stafford,* University of Chicago, and *Paul Theerman,* Museum of American History.

Saturday, April 25
Morning session title: NEWTON IN A MODERN PERSPECTIVE - The speakers are: *S. Chandresekhar,* University of Chicago, *Steven Weinberg,* University of Texas, and *Dudley Shapere,* Wake Forest University.

For further information write to Stephen Brush, Institute for Physical Science and Technology, University of Maryland, College Park, MD 20742.

(Note: Also in the Washington area, on April 21st and 22nd, prior to this Principia Symposium, The Division of History of Physics has two invited paper sessions on "The History of Astrophysics in the 20th Century," see page 65, in the Division News section.)

GRANTS AND FELLOWSHIPS

AHA Postdoctoral Fellowship in Aerospace History

The American Historical Association administers annually on behalf of NASA a fellowship competition for research in any area of NASA-related history of science, engineering, management, or policy. Research may be conducted at NASA headquarters or at various NASA centers. Deadline is February 1, 1987. The stipend in 1986 was $23,000, plus up to $1,000 for relocation and travel expenses, if needed. For further information, interested persons should contact the American Historical Association at 400 A Street, SE, Washington, DC 20003.

"Small Study" Opportunities - A committee appointed by AHA and other history societies suggested offering support for "small study" opportunities, namely research and writing efforts leading to the preparation of scholarly journal-length articles. Since November 1985, they have been receiving proposals for sponsored research and writing in NASA-related aero space history. Awards may be up to a level of $9,500 depending on the project. Proposals will be considered three times annually, and should be submitted by the following deadlines; February 15th, June 15th, and October 15th. Before preparing proposals, historians should discuss their ideas with Sylvia Fries, Director of the NASA History Office, NASA Headquarters, Washington, D.C. 20546.

Fulbright Scholar-in-Residence Program for 1987-1988

The deadline for receipt of proposals is November 1,1986. For detailed program guidelines and proposal forms and for further information, call or write to Dr. Mindy Reiser, Council for International Exchange of Scholars, Eleven Dupont Circle NW, Suite 300, Washington, DC 20036-1257; telephone 202-939-5404.

Harvard-Mellon Faculty Fellowships in the Humanities

These are for nontenured, experienced junior scholars, with a Ph.D. received before June 30, 1985 who at the time of appointment will have completed two or more years postdoctoral teaching as college or university faculty in the humanities. Special consideration will be given to candidates who have not recently had access to the resources of a major research institution. The one year appointment (July 1987 to June 1988 at an annual salary of $25,000) entails limited teaching duties, departmental affiliation, and an opportunity to develop scholarly research. Applications are due November 3, 1986; awards will be announced February 2, 1987. For application details and further information write to Richard M. Hunt, Program Director, Harvard Faculty Fellowships, Lamont Library 202, Cambridge, MA 02138; telephone 617-495-2519.

NASA

The **"Guide to Research in NASA History"** has been revised and renamed by the NASA History Office as of June 1986. It is now entitled **"History at NASA"**, and it describes the research accomplishments and opportunities of NASA's agency-wide history program. It also offers a concise guide to the historical research resources available at NASA Headquarters in Washington, D.C., at NASA facilities located around the country, and through the federal record system. Historical research for NASA is carried out on the basis of contracts with the agency. Historical research and writing on the basis of a contract award is different from the research grant more familiar to academic scholars in that contract historians are obligated to produce a specified "product" as a result of their work. A "product" might be a publishable manuscript, a research report, a collection of documents, finding aids, or a combination of all four. NASA's policy is to make all awards competitively. Opportunities for historical research and writing contracts with NASA are widely advertised (e.g. in newsletters of AHA, HSS, SHOT, etc.) and each proposal receives a careful "peer review", the primary basis for awarding a contract. Section 5 of **"History at NASA"** provides information on preparing proposals.)

NASA Fellowships are administered by the AHA; see the first item above in this section on Grants and Fellowships.

The Director of the NASA History Office is Sylvia D. Fries, The NASA History Office, National Aeronautics and Space Administration Headquarters, Washington, DC 20546.

National Endowment for the Humanities

NEH Overview of Endowment Programs
Copies of the new **"Overview"** became available July 1986. All 42 NEH programs are included, and most important is that the application deadline dates through 1987 are now listed. For a free copy write or call: July 1986 Overview, Room 409; National Endowment for the Humanities;
1100 Pennsylvania Ave. NW, Washington, DC 20506. Telephone 202-786-0438.

Travel to Collection Grants
These enable individual scholars to travel to use the research collections of libraries, archives museums, or other repositories. Individual applicants are eligible. Deadline for receipt of applications March 1, 1987 for projects beginning after June 1, 1987. Write or call: Travel to Collections, room 316, telephone 202-786-0463.

Summer Seminars for College Teachers Participants' grants provide support for faculty members engaged primarily in undergraduate teaching to participate in eight-week summer seminars directed by distinguished scholars at institutions with libraries suitable for advanced study. Individual applicants are eligible. Applications are submitted to the seminar director. Application deadline is March 1, 1987 for summer 1987 seminars.
Directors' grants provide support for scholars at institutions with libraries suitable for advanced study to design and direct summer seminars. Institutions are eligible applicants. The application deadline is March 1, 1987 for summer 1988 seminars. For information and application forms for both participants' and directors' grants, write or call: Summer Seminars for College Teachers, room 316, telephone 202-786-0463.

Reference Materials - Tools and Access - Grants in this program provide support for projects that promise to facilitate research in the humanities by organizing essential resources for scholarship and by preparing finding aids and other reference materials that can improve scholarly access to information and collections. Support is available in two categories: **Tools** (includes dictionaries, historical atlases, encyclopedias, data bases); **Access** (includes projects for such activities as archival arrangements, bibliographies, records surveys, cataloguing, guides to documentation). Grants are awarded to: Institutions of higher education, nonprofit professional associations and scholarly societies, and individuals. Application deadline is November 1, 1986 for projects that begin after July 1, 1987. Write or call: Reference Materials, room 318, telephone 202-786-0358.

Rockefeller Archive Center Grant

For details and address see HPN Vol. II, number 4, page 53. The deadline for applications is December 31, 1986.

Stanford Humanities Center Fellowships

These are intended for scholars or teachers in the humanities or other fields with related projects, who are interested in spending the academic year at Stanford. The fellowships are primarily for writing and individual research, but fellows will be expected to devote one-sixth of their time to teaching or otherwise contributing to the intellectual life at Stanford. The deadline is early December 1986. Write to Morton Sosna, Associate Director, Stanford Humanities Center, Mariposa House, Stanford University, Stanford, CA 94305.

JOBS

University of Connecticut

The University of Connecticut is looking to fill a tenure-track position, rank open, to begin September 1, 1987, in history of science or technology or some combination of the two. A Ph.D. is required; publications are desirable. The deadline is October 30, 1986. Send applications, including curriculum vitae and three letters of recommendation to Search No. 2, c/o Professor Bruce Stave, Chairman, Department of History, University of Connecticut, Storrs, CT 0628.

University of Georgia

The University of Georgia is seeking to hire an assistant professor (on tenure track) in the history of science since 1500. Teaching responsibilities include survey courses in Western civilization or United States history. Candidates must hold a Ph.D. by September 1, 1987 and demonstrate a strong commitment to excellence in teaching and research. The application deadline is November 10, 1986. For further information write to Lee Kennett, Search Committee, Chairman, Department of History, University of Georgia, Athens, GA 30602. AA/EOE

Smithsonian Institution

The Smithsonian Institution has two positions open: A Sloan Videohistory Project Assistant with a salary range of $14,390 to $23,170, and a Sloan Videohistory Project Manager with a salary range $31,619 to $41,105.

Both are for a four-year exploratory program to produce a set of videohistory studies now under development by members of the Smithsonian staff. The incumbent is expected to have knowledge of 20th century history of science and technology, scientific institutions, intellectual history or anthropology, as well as knowledge of videohistory and oral history techniques and general archival practices. For further information call or write to David H. DeVorkin, room 3557, National Air and Space Museum, Smithsonian Institution, Washington, DC 20560; telephone 202-357-2828.

BOOK PUBLISHERS

In this category we wish to announce books which are recently published or about to be published, and whose contents directly relate to the History of: Physics, Physicists, Laboratories, and Associated Institutions.

Academic Press

P.W.Hawkes editor - **The Beginnings of Electron Microscopy** Academic Press Inc. - Orlando, FL 32887

American Institute of Physics / Tomash Publishers Series

Compiled by *Katharine R. Sopka;* Introduction by *Albert E. Moyer* - **Physics for a New Century: Papers presented at the 1904 St. Louis Congress** Fifteen articles examine the prevalent and contradictory opinions on turn of the century topics. Authors of the articles include: Boltzmann, Langevin, Ostwald, Poincare', and Rutherford. Poincare's paper is the epoch-making, "The Principle of Relativity". Write to the American Institute of Physics Marketing Service, 335 East 45th St., New York, NY 10017

American Physical Society

Edward Hill - **My Daughter Beatrice** (See section on AIP AND APS NEWS, "APS Special Book Publication" on page 68.)

Locust Hill Press

Caroline L. Herzenberg - **Women Scientists from Antiquity to the Present** This is an international reference listing and biographical directory of some notable women scientists. It includes: over 2500 individual entries, biographical information on each scientist, and bibliographic and source information. Write to Locust Hill Press, Goshen-Sharon Turnpike, West Cornwall, CT 06796

W. H. Freeman

Julian Schwinger - **Einstein's Legacy** The groundwork was laid in the 17th century by Newton and in the 19th century by Maxwell. Schwinger describes the reconciliation of the conflicts that Einstein glimpsed as a sixteen-year old. Write to W.H.Freeman and Company 4419 West 1980 South; Salt Lake City, Utah 84104

National Academy of Sciences Press

The **Biographical Memoirs** is a series of volumes, beginning in 1877, containing the biographies of deceased members of the National Academy of Sciences and bibliographies of their published scientific contributions. The goal of the Academy is to have these memoirs serve as a contribution toward the history of American science. Each biographical essay is written by an individual familiar with the discipline and the scientific career of the deceased. Although the primary concern is with the professional lives and contributions, the memoirs also include aspects of the individual's life that led them to their scientific careers.

Biographies of physicists contained in Vol. 55 (Washington, D.C. 1985) are:

Leon Nicolas Brillouin; 1889-1969 by *L. Hilleth Thomas* pp. 69-92

Leland John Haworth; 1904-1979 by *Maurice Goldhaber and Gerald F. Tape* pp. 355-382

Thomas Lauritsen; 1915-1973 by *William A. Fowler and Fay Ajzenberg-Selove* pp. 385-396

Smithsonian Institution Press

Marc Rothenberg editor - **The Papers of Joseph Henry Volume Five: The Princeton Years January 1841 - December 1843** His reputation continues to grow and his lectures lead him to new fields.

Taylor and Francis

Sir Neville Mott - **A Life in Science** This the autobiography of Sir Neville Mott who played a major role in the early applications of Quantum Theory to atomic physics. Write to Taylor and Francis Inc. 242 Cherry Street, Philadelphia, PA 19106.

ANNOUNCEMENTS & REPORTS

Archeomaterials - A New Journal

Archeomaterials is dedicated to the publication of studies of products and materials which influenced historical and social trends before the modern era. Contributions are expected to place the technology within cultural perspective, rather than to be purely descriptive. Manuscripts are invited from both the United States and abroad. The first of two issues per year will appear in September 1986. Further information can be obtained

from the Editor, Dr. Tamara Stech, Department of Materials Science and Engineering, University of Pennsylvania, Philadelphia,PA 19104

CHOC

The Center for the History of Chemistry, CHOC, has a number of publications available. They include: "The Center for History of Chemistry." A description of CHOC's mission, programs, and resources. (Free on request.), "The Edgar Fahs Smith Memorial Collection in the History of Chemistry. " An overview of the Collection's printed, manuscript, and pictorial resources in the history of chemistry, chemical engineering and the chemical process industries. (Free on request.). There are also several CHOC catalogues, guides, etc. which are available at a very nominal cost. Of interest to those involved with the history of industrial organizations is "Corporate History and the Chemical Industries: A Resource Guide (1985)" edited by Jeffrey L. Sturchio - Historiography of the chemical process industries, with bibliographies and practical essays on business archives and oral history in the corporate setting. 53pp. $3.00. CHOC NEWS, the Center's newsletter, appears several times a year. Individual subscriptions are free. Institutional subscriptions are $20.00 a year. For further information write to: CHOC Publications, 215 South 34th Street, Philadelphia, PA 19104-6310.

History of Mass Spectrometry

The History Committee of the American Society for Mass Spectrometry (ASMS) has initiated an effort to catalogue historical artifacts in their discipline. As a first step toward a goal of establishing an exhibit on the history of mass spectrometry, the committee seeks information on the kind of artifacts in existence and where they are located. Anyone who owns or knows about such objects is invited to contact the committee and to provide a description of the artifacts and an indication of whether they might be donated to ASMS. Please contact Gary L. Glish, P.O. box Y, Oak Ridge National Laboratory, Oak Ridge, TN 37831.

HSPS - New Title

It was announced on the cover and in the Foreword of Volume 16 Part 1 of HSPS that HSPS now signifies **"Historical Studies in the Physical and Biological Sciences."** "Modern" for purposes of the journal is defined as meaning after Newton, from 1700 on. John L. Heilbron of The Office for History of Science and Technology of the University of California continues to be the editor. Additional advisory editors have been secured to help cover the modern biological sciences and the early-modern physical sciences; they are: Roger Hahn and John E. Lesch (Berkeley), Daniel J. Kevles (Caltech), and William B. Provine (Cornell). Another innovation is a list of current books of interest to the readership compiled by Henry Longwood, who is bibliographer for the history of science to the libraries of Stanford University.

It was announced that biophysics, radiation biology, biochemistry, molecular biology, genetics, and so on, historically considered, are suitable and welcome subjects for articles in the journal.

RECENT AND FUTURE ARTICLES

FISICA - A New Review Journal

(Published by the Faculdad de Ciencias Exactas y Naturales de la Universidad de Buenos Aires. For more information write to the editor: Sergio Zagier, Argerich 3130 Dto. 72, 1417 Buenos Aires, Argentina. It contains History of Physics Articles in Spanish.)

"Un Labarotorio de Quimica y una Sala de Fisics Conducidos desde Europa" by Maximo Baron (No.1 March 1986)

"Los 200 Anos de la Red de Diffraccion" by Constantino Ferro Fontan. This is a recapitulation of the History of Diffraction by David Rittenhouse in anticipation of the bicentennial (1987) of Fraunhofer and Fresnel. (No.2 April 1986).

The American Scientist

"Herman Weyl and the Unity of Knowledge" by John Archibald Wheeler (July-August 1986) In the linkage of four mysteries – the "how come" of existence, time, the mathematical continuum, and the discontinuous yes-or-no of quantum physics – may lie the key to deep new insight. The article is from a talk given at the Herman Weyl Centenary Congress, Univ. of Kiel, July 3, 1985.

HSPS

Articles related to physics in Volume 16,Part 2 include:
"The Origin of Quantized Matter Waves" by Olivier Darrigold,
"The Choice of CERN'S First Large Bubble Chamber for the Proton Synchrotron (1957-1958)" by John Krige and Dominique Pestre,
"Rutherford's Satellite Model of the Nucleus" by Roger H. Stuewer.

Il Nuovo Saggiatore

"La Preistoria del CERN" by Lanfranco Belloni (No.1 January-February 1986) (Articles are in Italian.) This article is based on a preliminary report of the CERN History Study Team published at CERN. It covers the period 1950 till July 1953 and the interactions of such people as Amaldi, Auger, Colonnetti, Joliot, Rabi, and others which resulted in the formation of CERN - the

highly successful European Collaborative Laboratory for nuclear and particle physics.
"Bolometri Criogenici e Spettroscopia Nucleare" by Gaetano Gallinaro (No 3 March-April 1986).

NTM - Series on the History of Science, Technology, and Medicine (NTM Schriftenreihe fuer Geschichte der Naturwissenschaften Technik und Medizin, Leipzig 22,) (Articles are in German.)

Articles related to physics in 1985 No.1 include:
"The Finnish Physicist Gunnar Nordstrom and his Contributions to the Development of Albert Einstein's General Theory of Relativity" by Eva Isaksson,
"Soviet Contributions to the History of Classical Mechanics" by A. T. Grigor'jan and M. M. Rozanskaja.
Articles in 1985 No.2 include:
"The Development of Alternating Current Theory" by O. D. Simonenko
"Industrial Physicists in the German Electrical Industry from the Beginnings to the Depression" by Helga Schultrich,
"The Discovery of the Transistor - A Fundamental Event in the Formation of Semiconductor Electronics as an Engineering Discipline" by Alfred Kirpal.

Optica Acta

"25 YEARS OF THE LASER" This special issue, Vol. 32 nos. 9 & 10, is to commemorate the 25th anniversary of the first laser assembled by Maimon and is a review of the work which was and is being performed in Europe.

Osiris - Volume 2 Articles related to physics include
"Kepler's Optics and the Neoplatonic Tradition" by D. C. Lindberg,
"The Scope of Renaissance Mechanics" by W. R. Laird,
"The Cosmological Question in Newton's Science" by Pierre Kerszberg,
"The Revival of the Physical Sciences in Britain" by David P. Miller,
"The Emergence of American Quantum Electrodynamics After World War II" by Sylvan Schweber.

Philosophical Magazine B,

"NEVILLE MOTT FESTSCHRIFT" in celebration of his eightieth birthday there are contributed articles in a special issue, Volume 52 No. 3.

Physics Today

"Pioneer Scientists in Pre-Independence India" by William A. Blanpied (May 1986) The article covers the lives of six physicists who played important roles in establishing scientific institutions in India.

"Physics and Psychic Research in Victorian and Edwardian England" by Janet Oppenheim (May 1986) Lord Rayleigh, J. J. Thomson, William Crookes, and Oliver Lodge were among the physicists who joined the Society for Psychical Research in the late 19th century.

"The Weak Interaction fron Now On" by Steven Weinberg (August 1986). This article is from a talk given at the symposium "Weak Interactions: Past, present, and future" in honor of *Sam Treiman*.

Book review by *Roger H. Stuewer* of "From x to Z: An Epic History of Modern Physics" by Abraham Pais (August 1986) The subtitle of the book is "Inward Bound: Of Matter and Forces in the Physical World" The "x" in the title stands for the x-rays discovered in 1895 and the "Z" is for the heavy boson discovered in 1983.

"Maria Goeppert Mayer: Atoms, Molecules, and Nuclear Shells" by Karen E. Johnson (September 1986). The mathematical physicist's early work in atomic and molecular physics, and her unfamiliarity with the "fashions" in nuclear physics, gave her the ideal preparation for solving the puzzle of the nuclear "magic numbers".

"The Shifting International Balance of Power in Experimental Particle Physics" by John Irvine, Ben Martin, James Skea, Tim Peacock, Nigel Minchin and David Couch (The Science Policy and Research Evaluation Group, University of Sussex, England) (November 1986). "Bibliometrics" – the analysis of publication and citation data – indicates that since 1979 the "power" in experimental particle physics has shifted from the United States to Western Europe.

Reviews of Modern Physics

"The Development of the Quantum Mechanical Electron Theory of Metals" by Lillian Hoddeson, Gordon Baym, and Michael Eckert (January 1987) The fundamental developments and events are traced of the emergence of the quantum-mechanical electron theory of metals from 1928 to 1933, in both their intellectual and institutional settings. The authors focus on three examples: band theory, magnetism, and superconductivity, the former two immediate successes of quantum theory, the latter a persistent failure during this period. The history revolves in large part around the theoretical physics institutes of the University of Munich under Sommerfield, Leipzig under Heisenberg, and the ETH in Zurich under Pauli.

Scientific American

"Leonardo's Contributions to Theoretical Mechanics" by Vernard Foley and Werner Soedel (September 1986) A close look at his visual mode of thinking reveals that his ideas had a bearing on the evolution of four aspects of mechanics.

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. (Longer summaries may be published of papers presented at Division symposia.) 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 publisher, and give the price in U.S. dollars, including cost of mailing (if applicable). We can also publish summaries of papers presented at meetings if the author is willing to distribute preprints; otherwise, if copies are not available but the author is willing to correspond with others about the research, a summary may be submitted for the "Work in Progress" section. Publication will be expedited if each summary is typed, on a separate sheet, in the format of the example below.

Summaries should be sent to Albert Wattenberg, Department of Physics, University of Illinois, 1110 W. Green Street, Urbana, IL 61801.

AURORAL PHYSICS

Schroeder, Wilfried. *Das Phaenomen des Polarlichts. (The Aurora Borealis).* x + 156 p., tables and figures. Darmstadt: Wissenschaftliche Buch Gesellschaft, 1984, DM 37.50

The book deals with the history of auroral research and the development of physics in the 19th century (dealing with the work by Sirks, Goldstein, Wiechert, Zollner, Birkeland, Stormer, et al.) The increasing interest in auroral physics is discussed, from the ancient to the present time. Most progress has been made in the 19th century as the relationship between solar activity and earth's magnetic field has been discovered. A comprehensive literature list (over 300 titles) and a chapter on the philosophy of science (related to the discussion by Kuhn and Popper) as case studies are added.

CAMBRIDGE PHYSICS

Hendry, John (Editor). *Cambridge Physics in the Thirties.* x + 209 pp. Boston: Adam Hilger, 1984.

The early 1930's was a golden age for Cambridge physics. In 1932 alone the Cavendish Laboratory played host to Chadwick's discovery of the neutron, the splitting of the atom by Cockcroft and Walton and the demonstration by Blackett and Occhialini of the existence of the positron. The following year saw Rutherford and Oliphant's work on the fusion of deuterium nuclei and in 1934 Chadwick and Goldhaber demonstrated the nuclear photoelectric effect and derived the first accurate figure for the mass of the neutron.

The volume contains the recollections of many of the distinguished physicists working in Cambridge during this exciting period. Most are specially written for this book, but some little-known articles from previously published sources are included. Together with Dr. Hendry's introductions, which analyse the historical background to the multitude of discoveries, they give a unique insight into the lives and work of men whose achievements have shaped the world in which we live today.

HELIOSTATS, ETC

Mills, A. A. *Heliostats, Siderostats, and Coelostats: A Review of Practical Instruments for Astronomical Applications.* Journal of the British Astronomical Association 1985, 95: 89-99.

Members of the 'stats family of astronomical instruments have in common the function of feeding light from a celestial object to a fixed telescope. Particular groups are known as heliostats, siderostats, uranostats and coelostats, considerable variations in design being possible within each group. This paper explains their general construction, differences, and respective advantages, concluding with a survey of those two-mirror forms currently applied to solar astronomy.
Author's address: Dept. of Astronomy and History of Science, The University, Leicester LEI 7RH, England. (Regret only xeroxes available)

ATOMIC CLOCKS

Forman, Paul. *The First Atomic Clock Program: NBS, 1947-1954.* Proceedings of the 17th Annual Precise Time and Time Interval Applications and Planning Meeting, Washington D.C., 1985 Dec. 1-3. 16 pp.

In the years immediately after the Second World War, the techniques developed for microwave radar were applied to the stabilization of klystron oscillators by the 24GHz inversion transition of the ammonia molecule. Following these initial demonstrations of the principle, Harold Lyons, Chief of the Microwave Standards Section of the Bureau of Standards' Central Radio Propagation Laboratory, built up a comprehensive program of atomic clock development. This paper describes that program's history, scope, and accomplishments – and its eclipse.
Author's address: MAH-5025, Smithsonian Institution, Washington, D.C. 20560, U.S.A.

CHEMICAL REACTIONS

King, Christine M. & Laidler, Keith J. *Chemical Kinetics and the Radiation Hypothesis,* Archive for History of Exact Sciences 1984, 30: pp. 45-86.

By the first decade of this century, the development of chemical kinetics had stagnated. What chemists lacked was a sound theory with which to interpret their experimental results. One such theory was to emerge in the shape of the Radiation Hypothesis, which suggested that the activation energy required for chemical reaction was supplied by infra-red radiation emitted from the walls of the reaction vessel.

Concerted efforts to prove the theory correct were to show, instead, its inherent weakness and ultimately to bring about its demise. The Radiation Hypothesis was relatively short-lived, but it served to catalyze the next stage of development in chemical kinetics.
For reprints: K. J. Laidler, Ottawa-Carleton Institute for Research & Graduate Studies in Chemistry. University of Ottawa, Ottawa, Ontario KIN 9B4

WIECHERT-LORENTZ LETTERS

Schroeder, Wilfried. *Hendrik Antoon Lorentz und Emil Wiechert. (Briefwechsel und Verhaltnis der beiden Physiker).* Archive for History of Exact Sciences 1984, 30, 2: 167-187.

Correspondence between Emil Wiechert and Hendrik Lorentz concerning theoretical physics (e.g. Lorentz-transformation, Voigt's transformation of 1887, the role of ether in modern physics, Einstein's theory). There are 12 letters which give new light on the development of physical research between 1899-1921. One outstanding point is the discussion between Wiechert and Lorentz related to Einstein's results.
Authors address: Hechelstrasse 8, D-2820 Bremen-Ronnebeck, Fed. Rep. of Germany.

HOOKE AND SPRING BALANCES

Jenemann, Hans R. *Robert Hooke unde die Fruehe Geschichte der Federwaage.* Berichte zur Wissenschaftsgeschichte, 1985, 8: 121-130.

A large number of the so-called electronic balances, for example those using wire strain gauges, are based on the elastic deformation of solid materials, and on the electrical measurement of the resulting changes in length. Such instruments must therefore be grouped into the class of spring balances. The spring balance operates within the limits of proportionality according to the law discovered by and named after Robert Hooke. No precise information about the spring balance can be found so far in the literature about balances: it is assumed that it was invented before 1700, without knowledge of the name of the inventor. As the result of a literature research it is shown that Robert Hooke found experimentally in 1676 with "ut tensio sic vis" not only the physical principles which led to the law of elasticity: he also drew practical conclusions from it, and in the treatise *De Potentia Restitutiva*, published in 1678, he described the most important types of spring balances. Experiments carried out by him to demonstrate the reduction of gravity with increasing altitude by using such a balance led, however, to a negative result because of lack of sensitivity. Further developments for more than 100 years were necessary, until the spring balance came into more general application.

DEUTERON

Stuewer, Roger H. *The Naming of the Deuteron.*. American Journal of Physics, 1986, 54, 3: 206-218.

The naming of the deuteron involved a protracted debate between 1933 and 1935. The principal protagonists were Harold C. Urey, Gilbert N. Lewis, Ernest O. Lawrence, and Ernest Rutherford, but others on both sides of the Atlantic entered the fray as well. This paper examines the arguments and issues that emerged in the debate, and the process by which agreement was finally achieved on the name for this new particle.
Author's Address: School of Physics and Astronomy, University of Minnesota, Minneapolis, Minnesota 55455.

RESPONSE TO VELIKOVSKY

Bauer, Henry H. *Beyond Velikovsky: The History of a Public Controversy*, xiii + 354 pp. Urbana: University of Illinois Press, 1985. $21.95

On the basis of detailed examination of Velikovsky's "Cosmos Without Gravitation" and other works, the author concludes that Velikovsky was a crank, but chastises the scientists who applied the label without adequate investigation. He discusses the problem of how the scientific community should respond to highly-publicized theories that flatly contradict established scientific principles.

BOHR VOLUME 6

Bohr, Niels. *Collected Works. Volume 6: Foundations of Quantum Physics 1 (1926-1932).* Edited by Jorgen Kalckar. New York: North-Holland 1985. $129.75 (subscription price, $111.00). U.S. Distributor: Elsevier Science Pub.

Volume 6 of Niels Bohr's Collected Works deals with the birth of the complementarity argument and traces its development through the years 1926-1932. The further extension and refinement of the argument, right up to Bohr's death, will be the subject of Volume 7.

HISTORY BIBLIOGRAPHY

Brush, S.G. and Belloni, L. *The History of Modern Physics: An International Bibliography.* xix + 334 pp. New York: Garland Publishing, Inc., 1983. $42.00 (Discount for APS members.)

Lists (with brief annotations) 2073 items dealing with physics since the discovery of X-rays in 1895. In most cases works already included in other major bibliographies are excluded, in order to make room for more obscure (foreign-language) items. The Introduction recommends a few books and articles useful for those who want an overview of each topic.

SCIENTIFIC THEORY

Earman, John (ed.). *Testing Scientific Theories.* (Minnesota Studies in the Philosophy of Science, Volume X). viii + 484 pp. Minneapolis: University of Minnesota Press, 1983.

Includes two historical case studies: Ronald Laymon, "Newton's demonstration of universal gravitation and philosophical theories of confirmation," pp. 179-199, and Michael R. Gardner, "Instrumentalism in Pre-Newtonian Astronomy," pp. 201-265.

PEIERLS AUTOBIOGRAPHY

Peierls, Rudolf. *Bird of Passage: Recollections of a Physicist*, Princeton, NJ: Princeton University Press, 1985. $29.50.

"Born in Germany in 1907, Peierls ... was a major participant in the revolutionary development of quantum mechanics in the 1920's and 1930's ... During World War II, he and O. R. Frisch initiated atomic-bomb research in England, and later joined the Manhattan Project in the United States. ... After the war, Peierls developed ... a research school at Birmingham University ..." (from the publisher's announcement).

YOUNG EINSTEIN

Pyenson, Lewis. *The Young Einstein: The Advent of Relativity.* xiv + 246 pp. Boston: Adam Hilger, 1985. $28.00

Einstein's education: mathematics and the laws of nature. Audacious enterprise: the Einsteins and electrotechnology in late 19th century Munich. Einspaenner: the social roots of Einstein's world view. Hermann Minkowski and Einstein's special theory of relativity. Physics in the shadow of mathematics: the Goettingen electron-theory seminar of 1905. Relativity in late Wilhelmian Germany: the appeal to a pre-established harmony between mathematics and physics. Mathematics, education, and the Gottingen approach to physical reality, 1890-1914. Physical sense in relativity: Max Planck edits the Annalen der Physik, 1906-18. Einstein's early scientific collaborations.

EDISON'S INVENTION

Friedel, Robert. *New Light on Edison's Light.* American Heritage of Invention and Technology, Summer 1985, 1, No. 1: 22-27.

Digging anew through the voluminous papers of Thomas Edison, scholars are constructing a fresh, more accurate and revealing understanding of his greatest invention.
Author's address: Department of History, University of Maryland, College Park, MD 20742.

REPORTING SCIENCE IN THE 1730'S

Greenberg, John L. *Degrees of Longitude and the Earth's Shape: the Diffusion of a Scientific Idea in Paris in the 1730s* Annals of Science, 1984, 41: 151-158.

The paper deals with the confusion that has arisen in studying the revival of geodesy in Paris in the late 1730s. The episode highlights the vast qualitative differences in science-reporting to be found in periodicals of the early eighteenth century, and the actual roles that certain better-known journals played in the genesis of what became a trademark for eighteenth- century Parisian science.
Author's address: 2, Residence duVal, 91120 Palaiseau, France.

THE JEFFERSON PHYSICAL LABORATORY

Holton, Gerald. *How the Jefferson Physical Laboratory Came to Be.* Physics Today, December 1984, 37, No. 12: 32-37.

The first building in America dedicated to physics opened its doors 100 years ago: "furnished in the plainest possible manner, but provided with everything which intelligent forethought could plan."
Author's address: Department of Physics, Harvard University, Cambridge, MA 02138.

BROWNIAN MOTION

Lavenda, Bernard H. *Brownian Motion Scientific American*, February 1985, 252, 2: 70-85.

Observing the random course of a particle suspended in a fluid led to the first accurate measurement of the mass of the atom. Brownian motion now serves as a mathematical model for random processes.

Lavenda is professor of chemical physics at the University of Camerino.

BOLTZMANN'S THEORY OF KNOWLEDGE

Locqueneux, R., Maitte, B., Pourprix, B. *Les Statuts Epistemologiques des Modeles de la Theorie des Gaz dans les Oeuvres de Maxwell et Boltzmann* Fundamenta Scientiae, 1983, 4: 29-54.

On several occasions Maxwell and Boltzmann felt the necessity to examine the epistemological status of the models they were using in physics. The status that Boltzmann confers on the model of the gas kinetics theory of know- ledge,a theory into which he integrates his conception of the model in physics.
Author's address: Laboratoire de Physique Theorique, U.E.R. de Physique Fondamentale, Universite des Sciences et Techniques de Lille, 59655 Villeneuve D'Ascq Cedex, France.

NEWTON'S COLORS

MacAdam, David L. *Newton's Theory of Color.* Physics Today, April 1985, 38, No. 4: 11-15.

On Grimaldi's prior discovery of the composition of white light; on the use of the terms "indigo" and "blue"; and on Newton's center-of-gravity principle for colors.
Author's address: The Institute of Optics, University of Rochester, Rochester, NY.

SCHROEDINGER

Meyenn, Karl Von. *Gespensterfelder und Materiewellen: Schroedingers Hang zur Anschaulichkeit.* Physikalische Blatter, 1984, 40, No. 4: 890-94.

Schroedinger war auf Grund seines erkenntnistheoretischen Standpunktes und infolge seiner praktischen Erfahrungen schon frueh von der Begrenztheit der klassischen Denkweisen ueberzeugt. Auf der Suche nach einer uebergeordneten Theorie fand er die Verbindung zu dem Gedankenkreis von Louis de Broglie. Alssich waehrend des Interpretationsstreites "die Hoffnung auf" eine Ruckkehr in die Welt der ihm vertrauten klassischen Kontinuumstheorie zerschlug, war Schroedinger nur mit Widerstreben bereit, zu der erkenntnistheoretischen Werte der Fruheren Jahre zurueckzukehren.
Author's Address: Dr. Karl von Meyenn. Lehrstuhl fuer Geschichte der Naturwissenschaften und Technik, Universitaet Stuttgart, Seidenstrape 36, 7000 Stuttgart 1, Germany.

MINKOWSKI

Osterbrock, Donald E. *Rudolph Minkowski: Obervational Astrophysicist*, Physics Today, April 1985, 38, No. 4: 50-57

His career spanned the era in which optical astronomy achieved vast improvements in sensitivity and radioastronomy emerged as a new science; his work contributed greatly to the successful cooperation between those two fields. This article is adapted from Biographical Memoirs, National Academy of Sciences, 1983, vol. 54. The author is a member of the staff of Lick Observatory, University of California, Santa Cruz.

GALILEO'S PLANETARY ATMOSPHERES

Parker, Gary D. *Galileo, Planetary Atmospheres, and Prograde Revolution*, Science, 1985, 227: 579-600.

Early in March 1610 Galileo was preoccupied with curious brightness variations of the newly discovered satellites of Jupiter. In formulating an incorrect explanation he advanced important generalizations about the existance of planetary atmospheres and counter-clockwise circulation within the solar system.
Author's address: Physics Department, Norwich University, Northfield, VT 05663.

PALOMAR

Rhodes, Richard. *Reflected Glory: How They Built Palomar.* American Heritage of Invention and Technology, Summer 1985, 1, No. 1: 12-21.

The great Hale telescope, with its 200-inch mirror, is still the masterpiece of American astronomical engineering.

NEWTON'S CONCEPT OF THEORY

Shapiro, Alan E. *Experiment and Mathematics in Newton's Theory of Color.* Physics Today, September 1984, 37, No. 9: 34-42.

Newton's decade-long struggle to devise a mathematical theory of color– abandoned in his landmark "Opticks"–gives unusual insight into his concept of a scientific theory.

The author is professor of history of science and technology at the University of Minnesota, Minneapolis.

YA. I. FRENKEL

Rashba, E.I. *The Prediction of Excitons (on the 90th Birthday of Ya. I. Frenkel').* Soviet Physics Usp'ekhi, 1984, 27, 10: 790-96.

Ninety years have elapsed in 1984 from the birth of Yakov Ilich Frenkel'. Already 30 years have passed since his death. But the name of Ya. I. Frenkel' is not forgotten. On the contrary, it is met ever more often in the scientific literature and it resounds in the scientific conferences and seminar. This test of time shows convincingly that the new physical concepts and mechanisms of processes presented in Frenkel's papers have been experimentally confirmed and are an organic part of modern physics.
Author's address: L. D. Landau Institute of Theoretical Physics of the Academy of Sciences of the USSR, GSP-1 117940 Kosygin St., 2, Moscow V-334.

CLAUSIUS' HEAT

Yagi, Eri. *Clausius's Mathematical Method and the Mechanical Theory of Heat.* Historical Studies in the Physical Sciences, 1984, 15, 1: 177-195.

Along the line of her first paper on Clausius (Historia scientiarum, 1981, 20: 77-94), the author discusses R. Clausius's mathematical method of treating heat. Clausius adopted Carnot's approach as the first order approximation in his own theory where the second order differentials were considered.
Author's Address: Institute of Physics, Faculty of Engineering, Tokyo University, Kawagoe-shi 350, Japan.

HISTORY OF SCIENCE COLLECTION

Herneck, Freidrich. *Wissenschaftsgeschichte.* Vortrage und Abhandlungen, 215 pp., plates. Berlin: Akademie-Verlag, 1984.

Includes "Max Planck ueber das Wesen der Wissenschaft"; "Galileo Galilei"; "Die Stellung von Hermann von Helmholtz in der Wissenschaftsge- schichte"; "Moritz Schlick als Physiker"; "Ein Brief Max
Plancks ueber sein Verhaeltnis zum Gottesglauben"; "Albert Einstein als Wissenschaftlicher Biograph"; "Ernst Mach und Albert Einstein"; "Otto Hahn und Lise Meitner - Ein Leben im Dienste der Strahlenforschung"; "Ein Alarmier- ende Botschaft - Neues zur Geschichte der ersten amerikanischen Atombomben"; "In memoriam Max Born."

TECHNOLOGY

Pinch, Trevor. *Recent Trends in the History of Technology.* British Society for the History of Science Newsletter, 1985, 16: 19-21.

Report on an international workshop at the University of Technology, Twente, The Netherlands, July 1984. The author is at the University of York, U.K.

CLAUSIUS' SECOND LAW

Schopf, H.G. *Rudolf Clausius, An Attempt to Understand Him.* Annalen der Physik, 1984, 41: 185-207 (in German).

It is shown that Clausius' original papers on the foundation of the Second Law can scarely be understood from the view-point of conventional textbooks. But reasoning with the aid of a quasi-economic model turns out to be the key of comprehension.
Author's address: H. G. Schopf, Technische Universistat, Sektion Physik, DDR-8027 Dresden, Mommsenstr. 13. German Democratic Republic.

PERPETUAL MOTION MACHINE

Ballyn, M. *Carnot and the Universal Heat Death.* American Journal of Physics, 1985, 53: 1092.

The relation between Kelvin's Heat Death and Carnot's prohibition of perpetual motion machines is traced. The link between them is that Carnot's proposition implies a perpetual destruction machine, whereas Kelvin's implies a perpetual degradation machine, the one historically evolving into the other. The link helps explain why Kelvin was not the one to inaugurate the new thermodynamics, in contrast to Clausius.

CARNOT'S CYCLE

Schopf, H.G. *Carnot's Paradigm and its Epistemological Implications.* Annalen der Physik, 1984, 41: 151-160 (in German).

This historical-critical essay traces the peculiarities of classical phenomenological thermodynamics back to the paradigm created by Carnot. Especially, the conceptual background of the Carnotcycle is explored.
Author's address: H. G. Schopf, Technische Universitat, Sektion Physik, DDR-8027 Dresden, Mommsenstr. 13. German Democratic Republic.

EINSTEIN'S STATISTICS

Baracca, Angelo and Rechtman, Raul S. *Einstein's Statistical Mechanics.* Revista Mexicana de Fisica, 1985, 3, 4: 695-722.

The foundations of equilibrium classical statistical mechanics were laid down in 1902 independently by Gibbs and Einstein. The latter's contribution, developed in three papers published between 1902 and 1904, is usually forgotten and, when not, rapidly dismissed as equivalent to Gibbs'. We review in detail Einstein's ideas on the foundations of statistical mechanics, and show that they constitute the beginning of a research program that led Einstein to quantum theory. We also show how these ideas may be used as a starting point for an introductory course on the subject.

SOMMERFELD-WIECHERT LETTERS

Schroeder, Wilfried. *Arnold Sommerfeld and Emil Wiechert.* Archive for History of Exact Science, 1985, 32, 1: 77-93.

First edition of 20 unpublished and unknown letters between Arnold Sommerfeld and Emil Wiechert between 1898-1903. The development of Sommerfeld's physical work is strongly related to the support and help of Emil Wiechert. Vice versa, Wiechert's standpoint on several physical theories is explained.
Authors address: Hechelstrasse 8, D-2820 Bremen-Ronnebeck, Fed. Rep. of Germany.

LAMPA

Kleinert, Andreas. *Anton Lampa 1868-1938.* Eine Biographie und eine Bibliographie seiner Veroffentlichungen. Bionomica-Verlag Mannheim, 1985. DM 14, -. (10 U.S. dollars, including cost of mailing.)

A biography of the Austrian physicist Anton Lampa, including a complete bibliography of his published writings and an unpublished manuscript on scientific literature in public libraries. After his doctorate in Vienna under Viktor von Lang, Lampa became one of the most skilled experimenters with short electromagnetic waves, and he was the first physicist to perform research work in high frequency spectroscopy with wavelengths of about 4 mm. In 1909, he became a full professor of physics in Prague where he succeeded Ernst Lecher as the third holder of the chair that had been established for Ernst Mach in 1867. Strongly influenced by Mach's philosophy, Lampa successfully supported Einstein's appointment to the chair of theoretical physics in Prague in 1911, and he continued to be on friendly relations with Einstein until his death. After World War I, Lampa withdrew from his chair, not willing to become a citizen of Czechoslovakia.
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