

History of Physics Newsletter

Volume III, Number 3

February 1988

ELECTION OF OFFICERS

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

Vice-Chairperson (to become Chairperson the following year),
Secretary-Treasurer (to serve for 3 years), and
Two Executive Committee Members (3 year terms.)

DIVISION NEWS

APS 1988 MEETINGS

During the spring of 1988, the Division of History of Physics is sponsoring three sessions of invited papers.

New Orleans, "History of Semiconductor Physics."
Wednesday evening, March 23rd, 1988. The session is being organized by Heinrich Medicus.

Georg Busch, ETH Zurich: "Early History of Physics and Chemistry of Semiconductors - From Doubts to Facts in a Hundred Years."

Hsu Yun Fan, Purdue University: "Development of Semiconductor Physics in the 1940s and 1950s."

John Bardeen, University of Illinois: "The Background to the Invention of the Transistor."

Otfried Madelung, University of Marburg, Fed. Rep. of Germany: "The Story of the Discovery of the III-IV Compounds."

Stephan von Molnár, IBM Watson Research Center: "The Evolution of Magnetic Semiconductors - A Personal Diary."

Baltimore, "The History of Cosmology"
Monday morning April 18th, 1988. The session is being organized by Peter Galison.

Peter Galison, Stanford University: "Introduction"

Robert Smith, Smithsonian Institution & John Hopkins University: "Discovering Galaxies - Themes in the History of Early 20th Century Cosmology."

Stephen Dick, U.S. Naval Observatory: "Extraterrestrial Intelligence as a Cosmological World View."

Alan Sandage, Mount Wilson Observatory: "Seeking the Curvature World 1930-1985: A History of Observational Tests of Cosmological Models."

Alan Guth, MIT & Harvard-Smithsonian Center: "Origin of the Idea of the Inflationary Universe."

Baltimore, "History of Symmetries in Physics"

Monday afternoon April 18th, 1988. The session is being organized by A. I. Miller.

The chairperson is *L.C. Biedenharn* of Duke University. The speakers are: *A. I. Miller* of the University of Lowell and Harvard University; *E. Wigner* of Princeton University; *A. Wightman* of Princeton University; *F. Gursey* of Yale; and *C. N. Yang* of SUNY at Stony Brook.

Business Meeting of the Division

Tentatively Monday April 18th, following the above session (on History of Symmetries in Physics) and in the same room, the Division of History of Physics will hold its annual business meeting. The Executive Committee will report on the activities of the Division for the past year and on plans for the coming year.

Division & APS Committees

Both the Division and the APS are interested in involving additional members in their activities. Every year, the Chairperson of the Division receives a request from the APS to suggest persons who would be both able and enthusiastic about serving on an APS committee. The goal is to encourage participation by a wide spectrum of members including persons in the early stages of their careers. The committees of the APS include: applications of physics, constitution and by-laws, education, finance, international freedom of scientists, minorities in physics, panel on public affairs, status of women in physics. If you are interested in the work of any of these committee or in helping to organize invited sessions of the Division, please send a curriculum vitae to the present Vice-Chairperson of the Division, Prof. Lawrence Badash, History Department, University of California, Santa Barbara, CA 93106.

Fund Raising

Divisions interested in raising funds for prizes and awards are subject to the rules of the APS Council. In the past, funds for prizes and awards have been raised from outside sponsors. The policy is being reconsidered and the Forum on Physics and Society has been given permission to raise funds from its membership for two awards. This is of interest to us as a possible source of some funds for a proposed History of Physics book prize or award.

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.

AIP & APS News

Science Writing Awards

The 1987 AIP Science Writing Award in Physics and Astronomy went to *Clifford M. Will* of Washington University in St. Louis for his book "Was Einstein Right?", which was published by Basic Books. The \$3000 prize and citation were presented to Will at the Grand Hyatt Hotel in Washington, DC on October 1st at an after-dinner session hosted by AIP and the International Union of Pure and Applied Physics. "Was Einstein Right?" is an account of the modern history of experimental relativity.

Entries for the 1988 AIP Science Writing Awards are being accepted. This year marks the twentieth year for the Journalist and Scientist Awards. For further information, contact the Public Information Division, American Institute of Physics, 335 East 45th Street, New York, NY 10017.

Maryland Physics Teachers' Day

Stephen Brush, History of Physics Division Councillor and a member of the Education Committee of the American Physical Society, is planning a one-day program for high school physics teachers to be held on Monday, April 18, 1988 in connection with the APS general meeting at Baltimore, Maryland. The goals of this program are: (1) to provide physics teachers with a perspective on the development of modern cosmology; (2) to offer specific information and suggestions on how to incorporate astronomy topics into physics courses; (3) to promote communication between physics teachers and the physics research community. The program begins with the morning session on the history of modern cosmology, sponsored by the APS Division of the History of Physics at the Baltimore Convention Center. (The topics of the talks are listed on page 33 of this newsletter.)

The teachers will have lunch with the morning speakers. Following lunch, a workshop on the use of astronomy in physics courses will be conducted by a representative

of Project STAR ("Science Teaching through its Astronomical Roots"). This project will provide materials that can be used in class. The program will conclude with a roundtable discussion on the topic, "What can the American Physical Society do to support high school physics teaching?" with members of the APS Education Committee and APS officers present to hear the views of physics teachers. (For further information about this program call Stephen Brush, 301-454-2724.)

Center for History of Physics Catalogs

A Catalog of Sources for the History of Solid State Physics will be published in 1988 by the AIP Center on behalf of the International Project on the History of Solid State Physics. Major input to the Catalog came from Project teams located in the United States at the University of Illinois (in collaboration with the AIP Center), and Germany (at the Deutsches Museum), with additional help from England (at the University of Aston), and France (at the Parc de la Villette, Paris). The Catalog is being compiled at the AIP Center and at the Deutsches Museum under the direction of Joan Warnow-Blewett and Jürgen Teichman. It will be published as Report No. 7 of the Center's International Catalog of Sources for History of Physics and Allied Sciences. The solid state physics catalog will include descriptions of over 100 oral history interviews conducted by the Project and over 200 collections of papers and records documenting the rise of solid state physics in the 20th century.

The AIP Center continues to solicit information on Collections in Repositories around the world to report in its Newsletter and to add to the Center's International Catalog of Sources for History of Physics and Allied Sciences. Researchers may ask the Center's staff to check this database for information on specific materials. The AIP is currently seeking funding to complete the computerization of the International Catalog and to make this valuable resource more widely available through the Research Libraries Information Network. (RLIN was described in HPN vol.III page 9.)

New AIP-AGU History Project

The AIP Center for the History of Physics, in conjunction with the American Geophysical Union (AGU), is starting up a major project to preserve materials documenting the history of twentieth-century geophysics. Geophysics has the attention of very few historians and other humanistic scholars. One consequence is an inadequate understanding of how the field has developed; another is that much of the irreplaceable historical "raw data" is in danger of destruction.

For the next year or so the main activities will be planning, fund raising, and hiring of staff; some urgent preservation work will also be done. The undertaking will

follow the example of earlier successful projects in the history of quantum mechanics, nuclear physics, astrophysics, and solid state physics. Initial steps have been funded by a \$10,000 grant from the AGU to the AIP Center and by AIP itself. During the next year, they hope to: (1) Set up an advisory structure. Part of this will be history committees in each of the AGU divisions. These committees will provide access to the scientific community which should assist in identifying files that should be preserved, people that should be interviewed, and events and writings that should be brought to the attention of historians. (2) Conduct oral history interviews. The effort is urgent since the recollections of some individuals could become lost to posterity. At the present time funds are available for interviewing only a few selected pioneers. **The AIP Center seeks historians of science interested in conducting interviews** (paid by the day or week as consultants) during this initial phase of the project. Please write to Spencer Weart, AIP, 335 East 45th Street, New York, NY 10017. (3) Send a mail request to Fellows of the AGU, especially those near or past retirement age. The hope is to get them to provide basic biographical information and if willing, to write autobiographical sketches which will be deposited in the AIP Niels Bohr Library. They hope to get the senior Fellows to make arrangements with appropriate repositories to preserve other historical materials.

Much planning needs to be done beyond these initial steps. It is anticipated that the project will take at least five years. The hope is that people will have ready access for the first time to the materials they need to write the history of geophysics.

AIP Opportunities for Employment and Grants

See the later section "JOBS" for a position of Post-doctoral Associate Historian at the Center for History of Physics. See the above section on the New AIP-AGU Project if you are interested in conducting interviews. The Center's grants-in-aid are described in the later section on GRANTS and FELLOWSHIPS.

ANNOUNCEMENTS & REPORTS

Martin Marietta Chair at Air and Space Museum

Dr. John A. Simpson has been selected to occupy the Martin Marietta Chair in Space History at the Smithsonian Institution's National Air and Space Museum. John Simpson was founder of the Laboratory for Astrophysics and Space Research at the University of Chicago. During his one-year tenure with the Air and Space Museum, he will prepare historical accounts of some of his projects and accomplishments, which include extensive research with instruments he designed for unmanned space exploration. Simpson has an extensive collection of documents and reports related to the early history and development of scientific research in space. In a joint effort, the University of

Chicago Library and the National Air and Space Museum will arrange to have these papers organized by an archivist so that they can be made available to researchers. While at the University of Chicago, Simpson participated in establishing the fledgling U.S. space exploration program. Simpson and his associates designed instrumentation for 25 unmanned spacecraft, including missions to Jupiter and Saturn and spacecraft to Mercury, Venus, and Mars. He contributed U.S. experiments for the Soviet Union's Vega mission to Halley's comet.

Simpson is the third distinguished scholar to occupy the chair. Preceding him are Dr. Leo Goldberg, a leading solar astronomer, and Dr. Herbert Friedman, a renowned pioneer in the field of rocket astronomy and an international leader in high energy astrophysics. The Martin Marietta Chair was established in 1985 to draw leading figures in the nation's space program to the museum and to expand the museum's research capabilities in space history.

Since 1977, a variety of research programs in support of outside scholars have been established at the Air and Space Museum. These include the Lindbergh Chair of Aerospace History, the Guggenheim and Verville fellowship programs, and the recently established International Fellowship program. The Martin Marietta Chair of Space History continues this tradition as the museum moves towards becoming an international center for the study of the history of aviation and the space sciences.

Don W. Wilson First U.S. Archivist

In November the Senate voted unanimously to confirm the nomination of Don W. Wilson, who is a historian and an archivist. Wilson received his Ph.D. from the University of Cincinnati, and he has held positions as Archivist of the Kansas State Historical Society, Historian and Deputy Director of the Eisenhower Library, and Associate Director of the State Historical Society of Wisconsin. He is leaving the Directorship of the Ford Library and Museum.

Since achieving independent status over two and a half years ago, the National Archives has had an Acting Archivist. The National Coordinating Committee for the Promotion of History has been working for three years for the confirmation of a professional, non-partisan archivist. If one wants to keep abreast of government actions affecting historical research, Dr. Page Putnam Miller, Director of the National Coordinating Committee for the Promotion of History publishes regularly a Director's Report. The administrative offices are: 400 A Street SE, Washington, DC 20003.

Sibley Award to Historian of Science

Liba Chaia Taub has won the Sibley Fellowship for Greek studies. She plans to extend her doctoral work on the philosophical and physical ideas of the second-century Alexandrian astronomer Ptolemy. The Sibley fellowship

carries a stipend of \$7,000. Candidates must be unmarried women between 25 and 35 years of age who hold (or are about to fulfill the requirements for) a doctorate. More information may be obtained by writing to the Sibley Fellowship Committee, Phi Beta Kappa, 1811 Q Street, N.W. Washington, DC 20009.

1987 History of Science Society Prizes

The 1987 Pfizer Award was given to **Christa Jungnickel** and **Russell McCormack** for their books "Intellectual Mastery of Nature: Theoretical Physics from Ohm to Einstein, Volume I: The Torch of Mathematics, 1800-1870; Volume II: The Now Mighty Theoretical Physics, 1870-1925" (University of Chicago Press, 1986).

The Zeitlin-Ver Brugge prize was given to **Richard S. Westfall** for his article "Scientific Patronage: Galileo and the Telescope," which appeared in *Isis*, 1985, 76:11-30.

The Watson Davis Prize went to **Thomas Hankin** for his book "Science and the Enlightenment" (Cambridge University Press, 1985). More information on these and other prizes of HSS can be obtained from the History of Science Society, 215 South 34th Street/D6, Philadelphia, PA 19104.

Charles Babbage Institute Research Project

The History of the Computer as a Scientific Instrument is one of several continuing research areas of the Institute. A study concentrating on **John von Neumann's** contributions to computing will result from an investigation of the changing role of computation in the sciences and of von Neumann's use of the computer as a scientific instrument. This expanded study will include an analysis of von Neumann's involvement in projects at the Institute for Advanced Study, the Atomic Energy Commission, Los Alamos Scientific Laboratory, Aberdeen Ballistics Research Laboratory, and consulting work for IBM, Standard Oil, and various government agencies. The study will serve as a springboard for a more general investigation of the impact of the computer on the sciences. This project is entering its final research stage, and writing has begun on book length manuscripts. The Charles Babbage Institute for the History of Information Processing is located at the University of Minnesota, 103 Walter Library, 117 Pleasant Street S.E., Minneapolis, Minnesota 55455.

Beckman Center for the History of Chemistry

The Center for the History of Chemistry was inaugurated in January 1982 by the American Chemical Society in alliance with the University of Pennsylvania, and in 1984 the American Institute of Chemical Engineers became the third sponsor. Dr. Arnold Beckman has given a generous capital grant to the renamed Center, "The Arnold and Mabel Beckman Center for the History of Chemistry," on the condition that the Center raise a matching sum. The ACS

is making this its first charge in its own "Campaign for Chemistry." The Centers programs include: public education, exhibits, oral history, a national library, archives, and scholarship and teaching. The Director is **Arnold Thackray** and the Associate Director is **Jeffrey L. Sturchio**; both are very well-known historians of the chemical sciences. The Center has a number of pamphlets that may be of interest to physicists interested in history research. They include: "Beckman Center Publications" which lists and describes currently available material, "What Is Oral History?" which reviews the nature and use of oral history techniques, and "Why Save Personal Papers?" which gives suggestions on whom, what, when, where, and how to save. Pamphlets and other information can be obtained by writing to Beckman Center for the History of Chemistry, 215 South 34th Street, Philadelphia, PA 19104-6310.

History at Los Alamos

A great deal of historical activity is taking place at the Los Alamos National Laboratory. A new archival program has been established, a history of wartime Los Alamos is being written, and the Bradbury Science Museum has been renovated and restaffed to reflect a new interest in the laboratory's past. **Robert W. Seidel**, who has researched and written on the history of Department of Energy laboratories and military research, was selected by the Laboratory to direct the museum in 1985. Among the programs he has introduced are "New Acquisitions" exhibits which reflect the donations of the scientific staff to the Museum's collections, and symposia on historical issues. The Bradbury Science Museum offers the visitors a view of the Laboratory's past and present of interest both to the scientist or to the untutored in modern physical science. The Museum has graphics, videotapes, and guided tours. The laboratory receives about 80,000 visitors a year.

In 1984 the Archives began a multi-year effort to research and write a scholarly, classified history of the Laboratory's World War II years covering all aspects of the wartime scientific work and community life. The historians **L. Hoddeson**, **P. Henriksen**, **C. Westfall**, and **R. Meade** are in the final stages of producing a classified manuscript by the fall of 1988. It is hoped to publish a declassified book from parts of the manuscript. For more information on the Laboratory Archives or the History Project, contact Roger A. Meade, Los Alamos National Laboratory, Mail stop C322, Los Alamos, NM 87545. Bob Seidel's mail address is Bradbury Science Museum, Mail stop B286, etc.

MEETINGS

The American Philosophical Society Library is sponsoring a symposium on "The Grand Enterprise: Modern Physical Science in America, 1920-1960" in honor of **John Clarke Slater**. The conference will be held on March

18-19, 1988, in Philadelphia and will feature sessions on the rise of modern physics in America. The participants include: Peter Galison, John Heilbron, Paul Hoch, Robert Kargon, Stuart W. Leslie, Larry Owens, Abraham Pais, Sylvan Schweber, and John A. Wheeler. Those interested in attending should write to Dr. Edward C. Carter II, Librarian, American Philosophical Society, 105 South 5th St., Philadelphia, PA 19106.

The **Brazilian Society on the History of Science (SBHC)** is cosponsoring with the Instituto Geológico de São Paulo a symposium on "History and Theory of Geological Knowledge" at the University of Campinas (UNICAMP), Campinas - State of São Paulo during July 5-7, 1988. Themes include History of Geological Sciences and Methodological questions on History and Theory of Geological Knowledge. Those interested in presenting a paper are kindly requested to send a one page abstract, that should be typed in Portuguese, Spanish, or English, before March 31, 1988, to Profa. Maria Margaret Lopes, Instituto de Geociências, UNICAMP, Cx. P. 1170 13100 Campinas-SP BRAZIL.

BSHS and HSS Anglo-American Conference - The British Society for the History of Science and the History of Science Society are cosponsoring a conference to be held in Manchester, England, July 11-15, 1988. Sessions relating to physics are scheduled for Tuesday morning and Thursday morning and afternoon. For more detailed information and to register (before April 1, 1988) consult the HSS Executive Secretary, Michael Sokal, Department of Humanities, Worcester Polytechnic Institute, Worcester, MA 01609; telephone (617) 793-5363.

The **Gottfried-Wilhelm-Leibniz-Society** - The Fifth International Leibniz-Congress will be held November 14-19, 1988 in the Congress Center, Hannover, the Stadthalle. Plenary sessions are planned for Monday and Friday. The remainder of the sections of the Congress will discuss the following topics: (1) Leibniz's relation to the past, to the history of philosophy and the sciences; (2) Leibniz and his contemporaries; (3) Leibniz's standing in the scholarship of his time, contemporary reception and resistance, followers and opponents; (4) Leibniz's presence in contemporary philosophy and science. During the Congress it will be possible to examine the manuscripts of Leibniz that are kept in the Niedersächsische Landesbibliothek. Saturday is reserved for visiting places associated with Leibniz. Those who wish to make contribution to the Sections are requested to inform the Congress by March 31, 1988. Enquiries should be sent to the Kongressbüro, Niedersächsische Landesbibliothek, Waterloostr. 8, 3000 Hannover 1, F.R.G.

History of Science Society - The annual meeting of the HSS for 1988 will be held conjointly with the meeting of

the American Historical Association in Cincinnati, December 27-30, 1988. The program chairs are actively looking for ideas for sessions. Proposals for regular sessions and for work-in-progress papers at the HSS sessions must be received by March 15, 1988. Please send copies of all proposals to the program cochairs: Joan L. Richards, Box N, Department of History, Brown University, Providence, RI 02912, and Shirley A. Roe, Department of History, U-103, University of Connecticut, Storrs, CT 06268.

The **Midwest Junto for History of Science** will meet March 18-20, 1988 at the University of Notre Dame. To receive registration information, write to Christopher Hamlin, Program in History and Philosophy of Science, University of Notre Dame, South Bend, IN 46556.

The **West Coast History of Science Society** will meet March 26-27, 1988 in Monterey, California at the Hopkins Marine Station. A broad theme of "Science and Government" was encouraged in paper submissions. For more information contact Jim Woodward, Department of History, California State University, Fullerton, CA 92634, or Robin Rider, Bancroft Library, University of California, Berkeley, CA 94720.

Humboldt University of Berlin is sponsoring the First International Summer Institute in the GDR on the Philosophy and History of Science. It is in cooperation with Robert S. Cohen of Boston University, Erwin Heibert of Harvard University, and Wm. R. Woodward of the University of New Hampshire. It will meet from June 17th to July 5th, 1988 at the Humboldt University of Berlin. Excursions to Leipzig, Dresden and other GDR cities are being planned. The focus will be on theoretical developments in the nineteenth-century (especially in physics, chemistry, biology, and psychology) and the historiography and philosophy of science. Archival work is encouraged after the institute; please contact the archives and tell them in advance. For more information and instructions on registration contact as soon as possible Prof. W. Woodward, Department of Psychology, Conant Hall, University of New Hampshire, Durham, NH 03824; telephone (603) 868-5895.

The **University of Maryland** at College Park will host the International Symposium on Space Time Symmetries, in commemoration of the **50th Anniversary of Eugene P. Wigner's** fundamental paper on the Inhomogeneous Lorentz Group completed in 1937. Among the many outstanding physicists participating are ten Nobel Prize Laureates. Priority on contributions will be given to those papers based on Wigner's paper on the Poincaré group [Ann. Math. 40, 149 (1939)]. For more information write to W.W. Zachary, Naval Research Laboratory, Code 4603, Washington, DC 20375 or Y.S. Kim, Department of Physics and Astronomy, University of Maryland, College Park, Maryland 20742.

BOOK PUBLISHERS

Announcements are limited to recently published books or new books or editions that relate to the history of: physics, physicists, laboratories, and associated organizations.

Adam Hilger

E.G. Bowen - Radar Days An account of the development of Radar in Great Britain.

J.G. Taylor Editor - **Tributes to Paul Dirac**

For more information write to Taylor and Francis, 242 Cherry Street, Philadelphia, PA 19106

AIP Conference Proceedings

C.N. Papanicolas, L.S. Cardman, and R.A. Eisenstein Editors - **Electron Scattering in Nuclear and Particle Science** The conference was in commemoration of the 35th anniversary of the Lyman, Hanson, and Scott experiment that first showed that electrons could be used to study the size of nuclei. Those giving historical talks included: *D.W. Kerst, A.O. Hanson, R. Hofstadter, B.D. McDaniel, J.D. Walecka.*

Send inquiries to AIP Conference Proceedings, AIP, 335 East 45th St., New York, NY 10017.

Alfred A. Knopf

F. Stern - Dreams and Delusions: The Drama of German History In this collection of essays, historian *Fritz Stern* argues that Albert Einstein's ambiguous relationship to Germany was emblematic of that country's history.

Write to Alfred A. Knopf, 201 East 50th Street, New York, NY 10022

Birkhäuser Boston

R. Novick, Editor - **30 Years of Parity Nonconservation A Symposium Honoring T.D. Lee** An historical overview of parity nonconservation was presented through first hand accounts of a few of the participants of the period.

Write to Birkhäuser Boston, Inc. c/o Springer-Verlag Distribution Center, P.O. Box 2485, Secaucus, NJ 07094.

Cambridge University Press

I. Newton - The Preliminary Manuscripts for Isaac Newton's 1687 Principia 1684-1686 In celebration of the tercentenary of the Principia, Cambridge University Library prepared this facsimile edition of the manuscripts Newton wrote in preparing his great work.

J. Bell - Speakable and Unspeakable in Quantum Mechanics: Collected Papers in Quantum Mechanics This is the entire collection of the published and unpublished papers on the conceptual and philosophical problems of quantum mechanics written by John Bell.

R.N. Cahn and G. Goldhaber - The Experimental Foundations of Particle Physics This book emphasizes the significance of crucial experiments; it includes reprints of a

selection of notable experiments. The bulk of the book is written in non-technical language, although technical passages are included.

B.N. Kursunoglu and E.P. Wigner Editors - **Paul Adrien Maurice Dirac: Reminiscences about a Great Physicist** In memoriam to Paul Dirac, this volume brings together works by twenty-four of his friends, colleagues, and contemporaries. The book surveys the critical influence of Dirac's work on modern physics. It includes not only quantum field theory and statistics, but also his work on gravitational waves and prediction of magnetic monopoles. Chapters also explore his human side, with many anecdotes about the man and his reputation.

C.W. Kilmister Editor - **Schrödinger: Centenary Celebration of a Polymath** This is an integrated and edited survey of the man and his science. Eminent scientists from many fields collaborated. Some of the contributions are biographical and reveal much about Schrödinger's character.

Write to Cambridge University Press, 32 East 57th Street, New York, NY 10022

G.N.S.F. Conference Series

F. Bevilacqua Editor - **Atti del VII Congresso Nazionale di Storia della Fisica** This is the fifth volume in the series being published by the Gruppo Nazionale di Coordinamento per la Storia della Fisica del C.N.R. It contains 40 articles in the history of physics presented at the conference which began on the 27th of March 1987. Almost all the articles are in Italian; the subject matter ranges from 17th century to 20th century physics.

Write to Gruppo Nazionale di Coordinamento per la Storia della Fisica del C.N.R., Realizzazione Editoriale Overseas s.r.l., via Moscova 44/1, Milano, Italy.

Harvard University Press

R.C. Williams - Klaus Fuchs, Atom Spy This is an academic book which is better researched and more scholarly in approach than other books on the same subject.

Write to Harvard University Press, 79 Garden Street, Cambridge, MA 02138.

Princeton University Press

P. Redondi - Galileo: Heretic Translated by *R. Rosenthal*. The book has been the subject of debate since its original publication in Italian. Redondi discovered new documents that predate the trial and he reinterprets Galileo's famous trial.

S. Sambursky All three books are available in paperback: **The Physical World of Late Antiquity, The Physical World of the Greeks** (with a new preface by the author), and **Physics of the Stoics**.

J. Stachel Editor, *D. C. Cassidy* and *R. Schulman*, Associate Editors - **The Collected Papers of Albert Einstein Volume I The Early Years: 1879-1902** This is the first of 40 volumes which will be published by the Einstein Project which is sponsored by Hebrew University of Jerusalem and Princeton University Press. (See HPN vol.III pg.23) For more information write to Princeton University Press, 3175 Princeton Pike, NJ 08648.

The University of Chicago Press

S. Chandrasekhar - Truth and Beauty: Aesthetics and Motivation in Science He considers how several outstanding physicists have described their own creative and aesthetic experience including Heisenberg and Einstein.

P. Galison - How Experiments End He argues that an experiment is no longer the work of an individual, but it is the enterprise of a complex community that has its own subgroups, publications, standards, and competitors.

P. J. Kuznick - Beyond the Laboratory: Scientists as Political Activists in 1930s America He traces the origin of the debate over scientists' social responsibility and reevaluates the relationship between science and politics in twentieth-century America.

W. P. Trower Editor - *Discovering Alvarez* Selected works of Luis W. Alvarez, with Commentary by His Students and Colleagues. It documents 19 of his outstanding contributions.

J. V. Field - Kepler's Geometrical Cosmology A study of the works from which Kepler earned a reputation for mysticism shows that this reputation cannot be justified.

Paperbacks from U. of Chicago Press

J. Z. Buchwald - From Maxwell to Microphysics Aspects of Electromagnetic Theory in the Last Quarter of the Nineteenth Century.

B. L. Cline - Men Who Made a New Physics Physicists and the Quantum Theory. With a new Foreword by *S. S. Schweber*.

P. Duhem - Medieval Cosmology: Theories of Infinity, Place, Time, Void, and the Plurality of Worlds Translated by *R. Ariew*.

T. S. Kuhn - Black-Body Theory and the Quantum Discontinuity, 1894-1912 With a new afterword.

For more information write to University of Chicago Press, 5801 S. Ellis Avenue, Chicago, IL 60637

GRANTS & FELLOWSHIPS

AIP Center for History of Physics

The AIP Center For History of Physics has a program of grants-in-aid for research in the history of modern physics and allied sciences (such as astronomy, geophysics, and optics) and their social interactions. Grants can be up to \$2,000 each - double the amount formerly offered. They can be used only to reimburse direct expenses connected with the work. Preference will be given to those who need part of the funds for travel and subsistence to use the Center's Niels Bohr Library in New York City, or to microfilm papers or to tape-record oral history interviews with a copy deposited in the Library. Applicants should either be working toward a graduate degree in the history of science, or show a record of publications in the field. To apply, send a vitae plus a letter of no more than two pages describing your research project, and including a brief budget showing the expenses for which support is requested. Send to Spencer Weart, Center for History of Physics, American Institute of Physics, 336 East 45th Street, New York, NY

10017. Deadlines for receipt of applications are June 30 and December 31 of each year.

American Philosophical Society

The American Philosophical Society has announced the Andrew W. Mellon Foundation Fellowship in Bibliography for 1988-89. The Fellow's primary responsibility will be to conduct a bibliographic study, to be published by the Library, of some important part of the Library's collection. Modern physics is among the topics for which proposals are encouraged. One-third of the Fellow's time will be free for study and research of the Fellow's choice. Candidates must have a Ph.D. or an equivalent record of professional experience and scholarly publications. The fellowship will be held for eleven months and carries a salary of up to \$25,000, commensurate with the Fellow's level of scholarly achievement. Benefits and travels funds are also provided. Candidates must apply by April 1, 1988, and appointments will be made by June 1. For further information write to Dr. Edward C. Carter II, Librarian, American Philosophical Society, 105 south 5th St., Philadelphia, PA

The American Philosophical Society also is inaugurating a new fellowship to support doctoral dissertations in the history of modern physical science. The fellowship is named in honor of *John C. Slater*, and carries a stipend of \$8,000. It is open to candidates who have passed their preliminary examinations and are writing dissertations on a topic in the history of the physical sciences in the 20th century. For information write to Dr. Edward C. Carter at the above address.

NASA History Office

The NASA History Office has announced an interest in funding the research and writing of publishable journal-length essays or monographs on NASA-related aerospace history. Subjects need not be limited to aerospace science but may include topics in aerospace policy, law, and management. Bibliographical and historiographical studies will also be considered. Up to \$9,500 may be awarded depending on the nature and scope of the project; awards will be contingent on the availability of funds. Proposals will be considered three times a year and should be submitted by June 15th, October 15th, and February 15th. Interested historians should discuss possible proposals with Sylvia D. Fries, Director, NASA History Office, National Aeronautics and Space Administration, Washington, DC 20546; telephone (202) 453-8300.

NASA also invites proposals from qualified individuals or institutions to compile and edit a documentary history of the space age with special emphasis on the U.S. space program. The completed volume(s) will include appropriate introductory passages to accompany each document. For guidance in preparing proposals see "History at NASA" (HHR-50), available from the NASA History Office, Washington, DC 20546. Deadline for proposals is August 1st, 1988. Please notify the History Office by July 1st if you plan to submit a proposal.

National Science Foundation

This is a reminder that some NSF programs have target dates during this spring or summer for receipt of proposals. The following are excerpts from the material that was in the October 1987 issue of HPN on page 26. Target dates for receipt of proposals for the Teacher Enhancement Program are February 1 and August 1, for Teacher Preparation April 15 and October 15, for Instructional Materials Development February 1, June 1 and October 1, and for Informal Science Education April 1, August 1 and December 1. Brief preliminary proposals are required for Instructional Materials Development and Informal Science Education and encouraged for the other two programs. They should be submitted to the appropriate program or, if in doubt, to Dr. Florence Fasanelli, Division of Teacher Preparation and Enhancement, National Science Foundation, Washington, D.C., 20550, 202-357-7074.

Dr. Fasanelli will also be available to respond to general questions about these programs and their relationship to the history of science, mathematics, and technology. Requests for information concerning college-level programs should be directed to the Office of Undergraduate Science, Engineering and Mathematics Education, 202-357-9644. The National Science Foundation also supports research in the History and Philosophy of Science, through its Directorate for Biological, Behavioral and Social Sciences. Dr. Ronald Overmann, 202-357-9677, is the Program Director.

NEH Grants and Fellowships

The National Endowment for the Humanities has a basic reference guide to its many programs, "*Overview of Endowment Programs*" which can be obtained from the National Endowment for the Humanities Public Affairs Office, Room 409, 1100 Pennsylvania Avenue, N.W., Washington, DC 20506.

New Grants for Elementary and Secondary School Teachers: NEH's new Teacher-Scholar Program will provide grants to allow teachers sabbatical leave for one academic year full-time, for independent study in the humanities which includes history. Teacher-Scholars will receive NEH stipends that may be as high as \$27,500 to replace the applicant's salary or to supplement pay up to the amount of the academic-year salary. Each applicant must submit a thoroughly planned course of study focusing on important primary and secondary texts in the humanities. NEH is taking applications with a May 1988 deadline for submissions. Grant-funded study could begin as early as September 1989. For more information, contact The Division of Education Programs, National Endowment for the Humanities, 1100 Pennsylvania Avenue, N.W., Washington, DC 20506.

NEH Fellowships for Teachers and Scholars: Fellowships for University Teachers provide support to undertake full-time independent study and research for members of faculty of Ph.D.-granting departments at universities. Individuals are the eligible applicants.

College Teachers' and Independent Scholars' Fellowships provide support to undertake full-time independent study and research for independent scholars and writers and for teachers in two-year, four-year, and five-year colleges and universities who are in departments that do not grant the Ph.D.

For both of the above fellowships the deadline for receipt of applications is June 1, 1988; for more information write or call (the Fellowship named above), Room 316, National Endowment for the Humanities, 1100 Pennsylvania Avenue, N.W., Washington, DC 20506 Telephone:(202) 786-0466.

Rockefeller Archive Center

The Grant-in-Aid program of the Rockefeller Archive Center is in its tenth year. Grants for 1987 totalled \$25,000 and the pool will be raised to \$30,000 for the 1988 grant year. The criteria established by the first grant committee for use in evaluating applications continues to be followed: the potential grantee must ascertain that there is material at the Center appropriate for the research topic; the research topic must have promise to be a contribution to scholarship, and there must be a suitable budget. Recipients of 1987 grants with topics of interest to physicists include:

Alan D. Beyerchen, Ohio State University for "A Biography of James Franck"

Gregory A. Good, West Virginia University for "Rockefeller Foundation Support of Geophysics in the 1930s."

Bruce V. Lewenstein, University of Pennsylvania for "Public Communication of Science in America: Science Journalism after World WarII."

Gilbert Whittemore, Harvard University for "The Politics of Radiation, 1928-1970."

An introduction and general guide to the material available for research at the Center is "Archives and Manuscripts in the Rockefeller Archive Center, 1984" (January 1987 printing) with accessions for years 1984, 1985, 1986 appended. Guides are available on request.

Grants of not more than \$1500 are made to scholars of any discipline who are engaged in projects that require substantial use of the collections at the Center. The deadlines for applications has been December 31st of the year preceding the award. Requests for application forms and any of the Center's Guides and Surveys should be addressed to: Director, Rockefeller Archive Center, Pocantico Hills, North Tarrytown, NY 10591-1598.

JOBS

AIP Center for History of Physics

The Center for History of Physics seeks applicants for the position of Post-doctoral Associate Historian. The person should hold a recent Ph.D. or a virtually complete dissertation in some area of the history of physical science. Appointment will be for one year, renewable up to three years. The historian will help conduct and administer the Center's programs in oral history interviewing of physical

scientists, the preservation and cataloging of their documents, and the use of such historical materials for scholarly and educational purposes, with ample opportunity to pursue personal research interests in related areas. The AIP offers excellent salary, benefits, and support services. Employment is expected to begin in the latter half of 1988. Anyone qualifying for the position is urged to send a letter, vitae, and names of three references to Spencer Weart, American Institute of Physics, 335 East 45th Street, New York, NY 10017.

University of Oklahoma

Applications are invited for the one-year position of visiting assistant professor in the Department of History of Science at the University of Oklahoma. The field of specialization is open. Teaching responsibilities include two courses each semester of the 1988-89 academic year. Candidates must have the Ph.D. degree completed by August 20, 1988. Send curriculum vitae and names of at least three references by March 10, 1988 to Chair, History of Science Department, 621 Physical Science Building, University of Oklahoma, Norman, OK 73019. AA/EOE.

SEMINARS FOR TEACHERS

NEH Summer Seminars for College Teachers

Prof. Stephen G. Brush - University of Maryland
Course Title: *Development of the Modern Scientific World-view*

June 13 to August 5, 1988.

Description: Intended for teachers in the humanities and social sciences who have little or no background in science, the seminar will discuss selected major discoveries and theories of the 19th and 20th centuries. The emphasis will be on transformation of ideas about the structure and evolution of the physical and biological world. Topics will include: Darwin and the evolutionary worldview, cosmology and cosmogony, quantum theory and the assault on realism, entropy and indeterminism, and current historical/philosophical/sociological controversies about the nature of scientific revolutions. Each participant will prepare a detailed case history of one discovery or theory, including its relevance to some area of the humanities or social sciences. There will be a maximum of 12 participants each of whom receives a stipend of \$3,500 to cover travel and living expenses. Write immediately or phone S.G. Brush, IPST, Computer and Space Science Building, University of Maryland, College Park, MD 20742. Telephone (301) 454-2724.

Prof. Everett I. Mendelsohn - Harvard University

Course Title: *The Social History of Science*

June 27 to August 19, 1988. For more information write immediately to E.I. Mendelsohn, Department of the History of Science, Science Center 235, Harvard University, Cambridge, MA 02138.

The Summer Seminars for College Teachers Program, offered by the National Endowment for the Humanities,

provides teachers of undergraduates with an opportunity for advanced study or research in their own fields or in fields related to their interests. Twelve teachers are selected to participate in each of the seminars, and they will work together in areas of mutual interests under the direction of the distinguished director. The seminars are designed especially for the NEH College Teachers Program and are not intended to be identical to courses normally offered by graduate departments, nor will graduate credit be given for them. Those selected will receive a stipend of \$3,500 to help cover expenses. The deadline for receipt of applications is March 1, 1988.

Fifty seminars funded by the NEH and being held across the country in the summer of 1988 are listed in a flyer. Eligibility and application information are also given in the flyer. For a copy of the 1988 or future flyers write to: NEH College Teachers Seminars, Room 409, 1100 Pennsylvania Ave. N.W., Washington, DC 20506.

RECENT & FUTURE ARTICLES

American Journal of Physics September 1987 includes:

"The Date and Time of the Vernal Equinox: a Graphical Representation of the Gregorian Calendar" by *R. L. Reese*
"Resource Letter IQM-2: Foundations of Quantum Mechanics Since the Bell Inequalities" by *L. E. Ballentine*.

"The Bezold-Brücke Phenomenon and Goethe's Rejection of Newton's Opticks" by *M. Duck*

December 1987 includes:

"Newton and Comets" by *A. Bork*

Annals of Science The March 1987 issue contains:

"Luigi Galvani and the Debate on Animal Electricity, 1791-1800" by *N. Kipnis*.

"The Scientific Origins of Controlled Fusion Technology" by *J. Hendry*.

Annual Review of Material Science August 1987

"The Early History of the Materials Research Laboratories" by *R. L. Sproull*.

Archive for History of Exact Sciences Volume 37 (1987) includes:

"Heaviside and the Development of the Symbolic Calculus" by *S.S. Petrova*

"The Heuristic Role of Mathematics in the Initial Development of Superconductivity Theory" by *T. Christidis, Y. Goudaroulis, and M. Mikou*.

British Journal for the History of Science Volume 20 (1987) includes:

"Corpuscles, Electrons and Cathode Rays: J.J. Thomson and the 'Discovery of the Electron'" by *I. Falconer*.

European Journal of Physics Vol.7, No.3 contains:

"The Light in Maxwell's Wave Equation" by *H.P. Krumm* and *M.W.J. Scourfield*

Ferroelectrics May 1987 includes:

"A Personal View of Early Soft Mode History" by *R. Landauer*.

The August 1987 issue contains four historical articles:

"Early History of Ferroelectricity" by *G. Busch*.

"History of Ferroelectricity 1938-55" by *W. Kanzig*.

"The Soft-mode Concept and the History of Ferroelectricity" by *R. Blinc*.

"Electro-optical Effects in Ferroelectrics" by *P. Gunter*.

Foundations of Physics October 1987 includes:

"Louis de Broglie (1892-1987)" (Contains quotations from de Broglie) by *G. Lochak*.

HSPS - Historical Studies in the Physical and Biological Sciences Volume 18, Part 1 includes:

"The First Large-scale Application of Superconductivity: The Fermilab Energy Doubler, 1972-1983" by *L. Hoddeson*

"Playing the Education Game to Win: The Military and Interdisciplinary Research at Stanford" by *S.W. Leslie*

"Preparing for the Space Age: University-based Research, 1946-1957" by *A. A. Needell*

"Behind Quantum Electronics: National Security as Basis for Physical Research in the United States, 1940-1960" by *P. Forman*.

IEEE J. of Quantum Electronics The June 1987 issue contains three historical articles. Very interestingly,

one is a previously unpublished note by *John von Neumann* speculating on the semiconductor amplification of light. "Notes on the Photon Disequilibrium Amplification Scheme, September 16, 1953" by *J. von Neuman*.

"Semiconductor Alloy Lasers - 1962" by *N. Holonyak, Jr.*

"An Introduction to the Development of the Semiconductor Laser" by *R. Dupuis*

IEEE Transactions on Magnetics The March 1987 issue is devoted to talks given at the *H. Kamerlingh Onnes Symposium* commemorating the 75th Anniversary of the Discovery of Superconductivity. Some of the historical papers are:

"Superconductivity: Discoveries during the Early years of Low Temperature Research at Leiden" by *R. de Bruyn Ouboter*

"Early Superconductivity Research (Except at Leiden)" by *A. B. Pippard*

"Origins of the Theory of Superconductivity" by *L. N. Cooper*.

"Superconducting Tunneling Spectroscopy and the Observation of the Josephson Effect" by *J. M. Rowell*.

ISIS September 1987 includes:

An essay review by *S. Shapin* on "Henry Oldenburg's Correspondence, Vols, I-XIII," edited by *M.B. Hall* and *A.R. Hall*

An essay review by *A. Pickering* on "The Second Creation: Makers of the Revolution in Twentieth-Century Physics" by *R. Crease* and *C. Mann*, "Inward Bound" by *A. Pais*, and "The Story of the W and Z" by *P. Watkins*.

New School for Social Research - Graduate Faculty Philosophy Journal Articles in the history of physics in

volume 12 (1987) include:

"Behind the Mirror" (The history of optics from Ptolemy to Descartes) by *G. Simon*

"Newton's Critique of Cartesian Method" by *C. Larmore*

"The Geometrical Treatment of Central Forces in Newton's 'Principia'" by *F. De Gandt*

"On the Orbits of the Planets" this is the first English translation of *G.W.F. Hegel's 1801 Dissertation*

NTM (Schriftenreihe für Geschichte der Naturwissenschaften Technik und Medizin) 1987 Heft 1 contains:

"Zur Entstehung der Polymerphysik" by *P. Ackermann*

1987 heft 2 includes:

"Before Bowditch: Henry Harte's translation of books 1 and 2 of Laplace's 'Mécanique Céleste'" by *I. Grattan-Guinness*

"Zur Entwicklung der Massenspektroskopie von den Anfängen bis zur Strukturaufklärung Organischer Verbindungen" by *H. Remane*

OSIRIS Volume 3 (1987) includes:

"John Tyndall, Pantheist: A Rereading of the Belfast Address" by *R. Barton*

"Science, Foundations, and American Universities in the 1920s" *R.E. Kohler*

"Solid State Physics Research at Purdue" by *P.W. Henriksen*

"Lloyd Berkner, Merle Tuve, and the Federal Role in Radio Astronomy" by *A.A. Needell*.

Physics Today January 1988 includes:

"Merle A. Tuve: Pioneer Nuclear Physicist" by *T.D. Cornell*

The February, March, or April 1988 issues will contain:

"Edmund Halley - Geophysicist" by *M.E. Evans*

"100 Years of Photoemission" by *G. Margaritondo*

"Making Weapons, Talking Peace" (excerpts) by *H. York*.

Physikalische Blätter Volume 43 (1987) includes an issue devoted to the centennial of *Erwin Schrödinger's* birth. (in German)

"Erwin Schrödinger - am 100 Geburtstag" and "Der Aufbau der Festkörper aus Atomen - Zu Schrödingers frühen Arbeiten aus den Jahren 1913 und 1914" both articles by *H. Rechenberg*.

"Erwin Schrödinger und die Statistische Naturbeschreibung" by *J. Audretsch*.

"Wellenmechanik und Raum-Zeit-Struktur: Erwin Schrödinger und die Allgemeine Relativitätstheorie" by *J. Audretsch*.

Reviews of Modern Physics July 1987

"The Development of the Electron Microscope and of Electron Microscopy" by *E. Ruska*.

Social Studies of Science Volume 17 (1987) includes:

"Charm Revisited: A Quantitative Analysis of the HEP Literature" by *A. Pickering* and *E. Nadel*.

"Accounting for Research: New Histories of Corporate Laboratories and the Social History of American Science" by *M. A. Dennis*.

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.

THE CASE OF LEO ARONS

Wolff, Stefan L. *Der Fall des Physikers Leo Arons*, in: *Wissenschaften in Berlin, Begleitband zur Ausstellung Band 3*, 1987, 76-80.

Leo Arons was a pupil of the school of August Kundt in Straburg, where he got his doctorate in 1884. The year after his Habilitation of 1888 he went to Berlin to follow Kundt. Because Arons was a member of the Social Democratic Party, the Prussian government tried to remove him from his position as a Privatdozent. The philosophical faculty didn't agree however, and so a special law was necessary to finish his university career.

EINSTEIN

Haubold, H. J., and Yasui, E. *Jun Ishiwara's Text über Albert Einsteins Gastvortrag an der Universität zu Kyoto am 14. Dezember 1922*. *Archive for History of Exact Sciences*, 1986, 36: 271-279.

During his tour of Japan in 1922, Einstein delivered a didactic lecture on the origins of the special and general theory of relativity to students of the University of Kyoto on 14 December 1922. Jun Ishiwara, a Japanese physicist who worked with Einstein in 1912 and published extensively on relativity, was his translator between German and Japanese. The present paper gives the translation of Ishiwara's text of Einstein's lecture from Japanese into German with some annotations of the authors. For reprint and additional papers write to H. J. Haubold, Zentralinstitut für Astrophysik, DDR-1591 Potsdam-Babelsberg, German Democratic Republic.

WHITFORD'S MEMOIRS

Whitford, A. E. *A Half Century of Astronomy Annual Review of Astronomy and Astrophysics* 1986, 24: 1-22.

In this autobiographical memoir, the author recalls the technological advances from the 1930s onward that enabled photoelectric detectors to take over a large share of the quantitative measurement of the radiation from astronomical sources. Examples from his own investigations include work on the interstellar reddening curve and the spectrophotometry of stars and galaxies. Current studies involve the contribution of resolved cool giants in the Galactic bulge to the integrated light of the nearest example of a spheroidal galaxy population.

HP-1 RESOURCE LETTER

Brush, Stephen G. *Resource letter HP-1: History of Physics*. *American Journal of Physics*, 1987, 55(8): 683-691.

This Resource Letter provides an introduction to the literature on the history of physics. Because of the overwhelming quantity of publications, the emphasis is on works covering broad topics and historical periods rather than on monographs dealing with special subjects or individual physicists, and on recent reference works that facilitate retrieval of more specialized information.

Author's address: Institute for Physical Science & Technology, University of Maryland, College Park, MD 20742.

YA I FRENKEL

Frenkel, V.J. and Frenkel, V.Y. *Yakov Il'ich Frenkel- A Scientist and An Individual*, Trudy Institut Fiziki an Estonskoj SSR, 1986, 58: pp. 7-24. Riga, Estonia.

A brief biography of an outstanding Soviet physicist, Ya. I. Frenkel (1894-1952) is presented. Frenkel's basic conceptions on the existence of vacancies and interstitials in crystalline lattices of solids (Frenkel defects) and on the creation of neutral migrating intrinsic electronic excitations in metallic solids (Frenkel excitons) are reviewed. The ideas of the

structure of liquids and the fluid-drop model of the Bohr-Frenkel nuclei are illustrated. The peculiarities of Frenkel's creative style characterized by the figurative reasoning of a scientist-artist are discussed.

HISTORY OF ELECTRICITY

Meya, J. and Sibum, H.O. *Das fünfte Element, wirkungen und Deutungen der Elektrizität*, Reinbek: Rowohlt 1987, Sachbuch Nr. 7726 (reihe: Deutsches Museum. Kulturgeschichte der Naturwissenschaftler und der Technik), 279 pp. DM 14,80.

This "history of electricity" aims at students, teachers and lecturers as readers. From its beginning in the 17th century to classical electrodynamics the main interpretations of electrical phenomena are described: the magical and mystical explanations of "sympathetic forces", the mechanistic emanation theories, the concepts of electrical fluids acting at a distance, electricity as a universal and vital force, and their interpretation as an effect of a mechanical ether. Each of these constructs is shown in its original conceptual frame.

The authors especially call attention to different kinds of dealing with inanimate nature, the experimental methods used by scientists, the underlying conceptions of the world and the intentions of forming a theory. Physics appears as a special way of interpreting natural phenomena, the process of understanding is always associated with the social and cultural background. It is obvious that formal theories do not by chance stand at the end of the historical development; the underlying ideas are abstract and cannot be interpreted on the basis of graphic models, their aim is control of nature. The authors try to contrast it with the conception of a variety of views and theories in order to call in question the restricted sense of truth that modern theories pretend to.

BARROW'S OPTICAL LECTURES

Isaac Barrow's Optical Lectures (1667), translated from the Latin by H. C. Fay and with an editorial introduction and annotations. Published by the Worshipful Company of Spectacle Makers, Apothecaries' Hall, Black Friars Lane, London, EC4V 6EL, price £25 to include packing and postage by surface mail.

This is the first ever English version of Barrow's 18 optical lectures. Widely praised at the time, they formed the basis for the theoretical part of Newton's own optical lectures, given after he succeeded Barrow as Lucasian Professor of Mathematics at Cambridge University.

Many readers will be surprised at the extent of Barrow's contribution to geometrical optics and by his extraordinary graphical constructions, to which an editorial appendix is devoted. Another appendix demonstrates that Barrow's treatment of image curvature anticipated much that was later ascribed to Petzval. The introduction includes a short biography of Barrow, together with an account of the historical background and much additional information.

THE PARTICLE EXPLOSION

Frank Close, Michael Marten and Christine Sutton, *The Particle Explosion*, 239 pp., Oxford University Press, 1987.

The even-numbered chapters tell the story of their discovery, from the first experiments with X-rays and the elucidation of the nature of the atom, to the great machines that today smash particles together and the underground caverns where physicists are seeking confirmation of a Grand Unified Theory. The odd-numbered chapters describe the major particles in more detail.

ANCIENT ASTRONOMY AND CIVILIZATION

Hetherington, Norriss S., *Ancient Astronomy and Civilization*, 187 pp., Tucson, Arizona: Pachart Publishing House, 1987. Paper, \$26.00.

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. Following brief introductory chapters on megalithic astronomy in Britain and Babylonian mathematical astronomy are more

thorough discussions of the Presocratics, Plato and mathematical astronomy, Aristotle and physical astronomy, and Ptolemaic astronomy. Generous excerpts from the works of Greek scholars, especially Plato, Aristotle, and Ptolemy, are presented in English translation. Maps show the locations of ancient civilizations and diagrams clearly explain technical scientific points. Each chapter contains recommendations for additional reading, in books and journal articles, and suggests film, film loops, and slide sets appropriate to accompany a course based on the book.

HERTZ AND HELMHOLTZ

Mulligen, Joseph F., *The Influence of Hermann von Helmholtz on Heinrich Hertz's Contributions to Physics*, American Journal of Physics, 1987, 55, pp. 711-719.

Heinrich Hertz, the discoverer of radiofrequency electromagnetic radiation, also made important contributions to our knowledge of the photoelectric effect, cathode rays, electromagnetic theory, classical mechanics, and meteorology.

In 1878 Hertz enrolled at the University of Berlin to study physics under Professor Hermann von Helmholtz. For the rest of his life he maintained a very close personal and scientific relationship with his mentor. The influence of Helmholtz on Hertz's choice of research topics and on the kind of physicist Hertz became is documented from the writings of these two famous physicists.

Author's address: Department of Physics, University of Maryland Baltimore County, Catonsville, Maryland, 21228.

EXPERIMENTAL PRACTICE

Galison, Peter, *How Experiments End* xii+330 pp., 31 halftones, 49 figures, 3 tables. Chicago: University of Chicago Press, 1987. \$14.95 paper; \$39.95 cloth.

During the 20th century the nature and standards of experimentation on microphysics have changed. From table-top experiments on atomic properties to massive, \$100 million team-executed accelerator experiments, shifts have occurred at every level including: the new role of computers, the dramatic evolution of detector technology, new relations between theory and experiment, and the creation of subgroups within larger teams. The central question of the book is how these changes have affected the way physicists separate artifact from effect.

This volume explores historical and philosophical issues surrounding growth of experimental practice by exploring, in detail, three clusters of experiments: experiments in the 1910s by Einstein and others to determine the gyromagnetic ratio of the magnetic atom, experiments in the 1930s surrounding quantum electrodynamics and the discovery of the muon; and experiments in the 1970s that began as W-boson searches and ended a decade later with weak neutral currents, ushering in the era of gauge physics.

RABI

Rigden, John S., *Rabi: Scientist and Citizen*, xii + 302 pp. New York: Basic Books, 1987.

Rabi was one of the most influential physicists of the 20th century. After learning quantum mechanics from the physicists who created the new theory, he returned from Europe in 1929 to begin his career at Columbia University. During the 1930s, Rabi's focus was physics. He started his molecular beam research with basic Stern-Gerlach deflection experiments and, through successive refinements, developed the powerful magnetic resonance method which enabled him to measure nuclear properties with unprecedented accuracy. World War II ended his concentration on physics; he became the Associate director of the MIT Radiation Laboratory, the American center for the development of microwave radar systems, and an advisor to J. Robert Oppenheimer at Los Alamos. After the war, Rabi advised world leaders as they sought to cope with the new force that attended the release of energy through nuclear fission.

This biography of Rabi is part of the Alfred P. Sloan Foundation Series.

FRUITFUL ERROR

Schöpf, H. G., *Error as Pioneer of Progress*, *Annalen der Physik*, in the press. (In German).

History of physics tells us that some of its great achievements stem from false, sometimes totally wrong, notions. This assertion will be proved by the stories of the discovery of Kepler's laws, Maxwell's equations, and Planck's radiation law. They give rise for a typology of fruitful error in science.

Author's address: H. G. Schöpf, Technische Universität, Sektion Physik, DDR-8027 Dresden, Mommsenstr. 13. German Democratic Republic.

DISPLACEMENT

Siegel, Daniel M., *The Origin of the Displacement Current*. HSPS, 1986, 17, 1:99-146.

The introduction of the displacement current in Maxwell's paper "On Physical Lines of Force" (1861-62) is seen as conditioned by his concern with the generalization of Ampère's law; his commitment to a mechanical explanation of electromagnetic phenomena; and his understanding of electric charge as an epiphenomenon of the electric field. Certain peculiarities in the original equations for the displacement current are seen as marks of its nineteenth-century context, rather than as "mistakes" on Maxwell's part.

Author's Address: Department of the History of Science, Helen C. White Hall, University of Wisconsin, Madison, WI 53706.

H. A. KRAMERS

Dresden, M., *H. A. Kramers: Between Tradition and Resolutions*, xxiv + 563 pp., illus., app., index. Berlin/Heidelberg/New York: Springer-Verlag, 1987.

This biography describes and analyzes the important (often insufficiently recognized) contributions of Kramers to the then emerging fields of quantum theory, quantum mechanics and quantum electrodynamics. From a hesitant beginning as a talented but somewhat undirected student in Leiden under Ehrenfest and Lorentz, Kramers became Bohr's first assistant, his first scientific collaborator, the first member of the Bohr Institute. During his ten year sojourn in Copenhagen, he struggled with the painful but exhilarating transition from a classical to a quantum world view. The intricate, convoluted continually changing personal relations between Bohr, Pauli, Heisenberg and Kramers in this transition are a major topic throughout the book. Special attention is paid to the vacillating relations between Kramers and his teachers, students, competitors, critics, the influence of the surrounding culture, the scientific and institutional demands and constraints, the impact of intensely private emotions. All have a significant and surprisingly direct influence on the kind of science produced. Kramers' derivation of the dispersion relations and the ill-fated Bohr Kramers Slater theory are discussed on both a qualitative and technical level as is his work on renormalization theory. The rest of his work is discussed more qualitatively. However Kramers' individual approach to physics and life, his role

in Dutch and International Physics is analyzed in detail.

DARKNESS AT NIGHT

Edward Harrison, *Darkness at Night—A Riddle of the Universe*, 293 pp., illus., Cambridge, Harvard University Press, 1987, \$25.

For more than four centuries, astronomers and other investigators have pondered the enigma of a dark sky and proposed many provocative but incorrect answers. *Darkness at Night* 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—one of the most intriguing in the history of science—the astronomer and physicist Edward Harrison explores the concept of infinite space, the structure and age of the universe, the nature of light, and other subjects that once were so perplexing. He introduces a range of stellar intellects, from Democritus in the ancient world to Digges in the reign of Queen Elizabeth, followed by Kepler, Newton, Halley, Chéseaux, Olbers, Poe, Kelvin, and Bondi. Harrison's strong grasp of history—from the Greeks to the twentieth century—adds perspective, depth, and scope to the narrative.

JOSEPH HENRY:
AC PHENOMENA

Gluckman, Albert G. *Joseph Henry's laboratory notes (1836-1842)*, Research Notes and Memoranda of Applied Geometry for Prevenient Natural Philosophy (POST-RAAG Reports), March 1986, 199, pp. 1-55.

This historical essay contains a number of specific translations from the original German and French languages, of papers of a number of Henry's European contemporaries. Emphasis is placed on 1) the priority of Joseph Henry in being the first to transmit and receive electric signals, which were sent 220 feet through Nassau Hall at Princeton University (then the College of New Jersey) in 1842; 2) Henry's position as a precursor in the technical aspects of attaining higher a.c. frequencies by means of spark gap and condenser/capacitor research; and 3) a discussion of later 19th century research on a.c. resonance.

Author's Address: c/o Professor emeritus (U. of Tokyo) Kazuo Kondo, 1570 Yotsukaido, Yotsukaido City, Chiba-ken, 284 Japan. Formerly Research Association of Applied Geometry.

BEFORE BOHR

Carazza, B., Guidette, G.P., *Spectroscopia e Modelli atomici prima di Bohr*, Rendiconti seminario Facoltà Scienze Università Cagliari, 1984, 54 fasc. 1, pp. 73-86.

The starting point of the "old quantum theory" was the Bohr atomic model, from which the quantization rules were subsequently developed. In turn, the Bohr theory was the final outcome of a number of attempts to obtain satisfactory models of the atom. The main physical requirements to be satisfied by such model were: to explicitly include the electrons, to explain the periodic properties of chemical elements and to predict the existence and features of line spectra. They analyze, in the light of the above requirements, the better known proposals before Bohr's; some of them already contained proposals for a role of Planck's constant in atomic structure. To clearly illustrate the subject matter as well as the evolution of the atomic model, they also present a short account of the knowledge of spectroscopy during the relevant period and they recall Rutherford's scattering experiments. In this way, they intend to give a short but exhaustive description of the historical scenario which lay in the background of Bohr's achievement.

SCIENTIFIC OBJECTIVITY

Hetherington, Norriss S., *Science and Objectivity: Episodes in the History of Astronomy*, xii + 165 pp. Ames, Iowa: Iowa State University Press, 1988. Hardcover, \$24.95.

Using episodes from the history of astronomy, this book critically measures the success of scientists in their pursuit of objectivity and asks whether science is truly objective or ever can be. Topics included are Thomas Harriot and the lunar landscape, Robert Hooke and the stellar parallax, William Herschel and the diameter of Uranus, William Lassell and rings around Neptune, Percival Lowell and Martian canals, Sirius B and the gravitational redshift, a general solar magnetic field, and the purported rotation of spiral nebulae. The historical study of instances in which scientists following accepted procedures found what they expected to find even though the phenomena did not exist poses a challenge to the image of science as possessor of objective empirical facts independent of personal biases of the measurers. One reader likened the book in breadth of interest to Thomas Kuhn's "Structure of Scientific Revolutions"; another reader characterized it as a bible for iconoclasts.

NOMINEES FOR THE 1988 DIVISIONAL ELECTION

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

For Vice-Chairperson

Max Dresden

Max Dresden was born in Amsterdam, The Netherlands, in 1918. After studying at the Universities of Amsterdam and Leiden he obtained a Ph.D. degree at the University of Michigan in Ann Arbor in 1946. His academic career took him from the University of Kansas, Johns Hopkins University in Baltimore, Northwestern University in Evanston (where he also was department chairman), University of Iowa at Iowa City, to his present position as Leading Professor of Physics and Executive Officer at the Institute for Theoretical Physics at the State University of New York at Stony Brook. He was Holder of the Kramers Chair in Utrecht 1976, the van der Waals Chair in Amsterdam 1967, a visiting scientist at the Bohr Institute in Copenhagen, CERN Geneva, Argonne National Lab, Brookhaven National Lab, at the Scuola Normale in Pisa, and at the "Institute des Hautes Etudes" in Paris. His research in theoretical physics, has dealt with statistical mechanics, S matrix and field theory, solid state problems, positrons, exactly soluble models, the relations between mathematics and physics, cosmology. He was the original organizer of the Midwest Conferences in theoretical physics.

His interest in theoretical physics has broadened steadily to encompass new areas - relating science to its social, cultural and personal settings, culminating in a serious interest in the history of physics. This led after some ten years of study to an extensive biography of H. A. Kramer: "Between Tradition and Revolution" published in the summer of 1987. The involvement in history has continued to expand. He belonged to the original group which initiated the formation of the history of science division. He was the first divisional councillor of the division. He was one of the organizers of the conference "From Pions to Quarks" held at Fermilab in the summer of 1985, and of the conference "Historical Aspects of Field Theory and Gauge Theory" held in Logan, Utah in the summer of 1987. Efforts currently underway deal with a historical analysis of unification attempts, "the role of courage in physics," "a historical perspective of the relation between mathematics and physics." He is a Fellow of the APS and an editor of *Physica A*.

John Rigden

John S. Rigden is currently Director of Physics Programs at the American Institute of Physics. He received his B.S. from Eastern Nazarene College in 1956 and his Ph.D. from Johns Hopkins University in 1960. After his graduate work, he was a post-doctoral fellow at Harvard University. He has taught at Eastern Nazarene College, Middlebury College, and the University of Missouri-St. Louis. He has served both as member and as chairperson of the nominating committee of the APS History of Physics Division. Other professional activities include: the United States Representative to the International Science Exhibition in Burma; Fulbright Fellow to Uruguay and Burma; Visiting Scholar, Harvard University; Editor, *American Journal of Physics*. He is the author of *Rabi: Scientist and Citizen*. His research interests include the history of 20th-century physics and the history of contemporary

physics. He is currently writing a book on the role of the hydrogen atom in the history of physics.

For Secretary/Treasurer

C. Stewart Gillmor

C. Stewart Gillmore, born 1938. Professor of History and Science and Chair, Department of History, Wesleyan University, Middletown, CT. BSEE, Stanford, 1962. Ph.D., History of Science, Princeton, 1968. Ionospheric Physicist, National Bureau of Standards, 1960-62; NSF Exchange Scientist with Sixth Soviet Antarctic Expedition, 1960-62. Sabbatical/Leave as Fulbright Senior Research Fellow; Cavendish Physical Laboratory, 1976; NASA History Scholar, 1981; NSF-CNRS Research Fellow at the Center for Research in Terrestrial and Planetary Physics, Paris, France, 1985. Author: *Coulomb and the Evolution of Physics and Engineering in Eighteenth Century France*, 1971, and about 40 papers. Editor: *Transactions - American Geophysical Union*, 1983-86. Editor: (1983-) *History of Geophysics* series, 3 vols., 1985-87. Major area of research: history of physics and engineering 1750-present, especially history of ionospheric and space physics; science policy studies; quantitative measures of science.

Stanley Goldberg

Stanley Goldberg is currently consultant to the National Museum of American History where he is developing elements of a soon to be opened exhibit: "A Material World"; and he is consultant to the National Air and Space Museum where he is serving as director of the Sloan New Liberal Arts Workshop. He has been Professor of the History of Science at Hampshire College. He is the author of *Understanding Relativity: Origins and Impact of a Scientific Revolution* (Birkhauser, 1984) and is now editing, with Roger Stuewer, a volume of papers commemorating the hundredth anniversary of the 1887 Michelson-Morley experiment. He is also working on a biography of General Leslie R. Groves, military head of the Manhattan Project.

For Executive Committee

John P. Blewett

John Blewett was born on April 12, 1910, in Toronto, Canada. He received his Ph.D. in physics from Princeton University in 1936. During the 1936-37 year he studied at Cambridge University in England under a Fellowship of the Royal Society of Canada, after which he accepted a position at the General Electric Company Research Laboratory. In 1945, while at General Electric, using a betatron, he was the first scientist to observe synchrotron radiation. From 1947 through 1960, he served as scientist and then senior scientist at Brookhaven National Laboratory where he played a leading role in designing the Cosmotron (the world's first multi-billion volt particle accelerator) and the 33 BeV Alternating Gradient Synchrotron. From 1960 to 1972 he served as the deputy chairman of the Brookhaven Accelerator Department and was appointed Special Assistant to the Director for Energy in 1972. From 1972 to 1978, he returned to work on the design of Brookhaven's National Synchrotron Light Source. In 1970, he founded the journal *Particle Accelerators*, and served as its editor for eight years. He has written, with M. S. Livingston, a text on Particle Accelerators. His research interests have included x-ray crystal analysis, mass spectrography, nuclear physics, microwaves and the design of high-energy electron and proton accelerators. He is a Fellow of the New York Academy of Science, the APS, and the IEEE.

(Executive Committee Nominees continued)

Arthur I. Miller

Arthur I. Miller is University Professor of Philosophy and History, University of Lowell, and an Associate of the Physics Department, Harvard University. He received his B.S. in physics from the City College of New York in 1961, and his Ph.D. in physics from M.I.T. in 1965. His research interests include the history and philosophy of nineteenth and twentieth century science and technology. Among his research results are books entitled *Albert Einstein's Special Theory of Relativity: Emergence (1905) and Early Interpretation (1905-1911)* (Addison Wesley, 1981), *Imagery in Scientific Thought: Creating 20th-Century Physics* (Birkhäuser, 1984; M.I.T. Press, 1986) and *Frontiers in Physics: 1900-1911* (Birkhäuser, 1986). He is the editor of a *Source Book on Quantum Field Theory* to be published by Harvard University Press in its *Source Book* series. He has been an Associate Editor of the *American Journal of Physics*, and the recipient of fellowships and grants from the John Simon Guggenheim Memorial Foundation, American Philosophical Society, American Council of Learned Societies, National Endowment for the Humanities, National Science Foundation, the Centre National de la Recherche Scientifique, and the Fritz Thyssen Stiftung. In the fall term of 1977 he was visiting professor at l'Ecole Pratique des Hautes Etudes, Paris. He was Vice-Chairman, Division of History of Physics, American Physical Society for 1983-1984, and Chairman for 1984-1985.

Kathryn Olesko

Kathryn Olesko is Assistant Professor in the Department of History of Georgetown University. She received her B.A. in physics and mathematics from Cornell University in 1973 and her Ph.D.

in history of science from Cornell University in 1980. She was awarded National Science Foundation and National Endowment for the Humanities Fellowships in 1984-1985. Her recent publications include: *Albert Michelson and the Reform of Physics Instruction at the Naval Academy in the 1870s*, *Physics as a Calling - Discipline and Profession*, and *the Königsberg Seminars for Physics* (forthcoming Fall 1988 from Cornell University Press). She has also written other articles on science teaching in Germany. Her research interests have foci on the history of physics education in American and Germany. She serves as liaison for the Joint Atlantic Seminar in the Physical Sciences. She chairs the committee on Education and is a Council member of the History of Science Society.

Melba Phillips

Melba Phillips is Professor Emeritus of the University of Chicago. She was born in Indiana and took her Ph.D. at the University of California in 1933. Her physics research interests have been primarily in the theory of atomic spectra of light atoms. She is co-author (with W.K.H. Panofsky) of *Classical Electricity and Magnetism* and (with F. T. Bonner) of *Principles of Physical Science*. She has taught in a variety of institutions in addition to Chicago, including Brooklyn College, the University of Minnesota, Washington University (St. Louis), and SUNY, Stony Brook. As to history, she has worked mainly in the history of physics education, and has edited two reprint collections: *History of Physics - Readings from Physics Today* (with Spencer Weart) and *Physics History from AAPT Journals*. She is currently looking into the history of the American Physical Society. Her honors have included the Oersted Medal of the American Association of Physics Teachers and the Karl Taylor Compton Award of the American Institute of Physics. She recently gave her first Forman Lecture on physics education at Vanderbilt University.

1988 BALLOT

The ballot must be returned by March 15, 1988 to Professor R. D. Sard, Physics Department, University of Illinois, 1110 W. Green St., Urbana, Illinois 61801. The Division needs to elect a Vice-Chairperson (one-year term, who becomes Chairperson the following year), a Secretary-Treasurer (three-year term) and TWO members of the Executive Committee (three-year terms).

Vice-Chairperson - Vote for ONE MAX DRESDEN JOHN RIGDEN**Secretary-Treasurer - Vote for ONE** C. STEWART GILLMOR STANLEY GOLDBERG**Executive Committee - Vote for TWO** JOHN P. BLEWETT ARTHUR I. MILLER KATHRYN OLESKO MELBA PHILLIPS

HISTORY OF PHYSICS NEWSLETTER

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