History of Physics Newsletter

Volume III, Number 5 February 1989

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), Two Executive Committee Members (3 year terms.)

In 1990, there will be an election of Division Councillor. Suggestions for nominees for Division Councillor should be sent before April 25, 1989 to the Division Chairperson, Professor L. Badash, History Department, University of California, Santa Barbara, CA 93106.

DIVISION NEWS

APS 1989 MEETINGS

During the spring of 1989, the Division of History of Physics is sponsoring three sessions of invited papers. See also the announcement of the Gibbs Symposium, page 68.

St. Louis, "History of Optical Properties of Condensed Matter" Tentatively scheduled for Tuesday evening, March 21st, 1989. The session is being organized by Heinrich Medicus. Speakers include:
Giorgio Margaritondo, University of Wisconsin: "From Hertz's Photoelectric Effect to Photoemission Spectroscopy."
Manuel Cardona, Max-Planck-Institute, Stuttgart: "The Fundamental Optical Spectra of Semiconductors: From Reflection through Modulation Spectroscopy to Resonant Light Scattering."
Frederick Seitz, Rockefeller University, New York: "F Centers Revisited, or Deja Vu All Over Again."
Nicolaas Bloembergen, Harvard University: "The Historical Relationship between Non-linear Optics and Condensed Matter."

Baltimore, "From Particle Physics to Particle Astronomy: The Evolution of Cosmic Ray Science" This session is scheduled for Monday morning, May 1st, 1989; it is being organized by Allan Needell. Speakers include:
Charles A. Zeigler, Brandeis University: "Balloon Technology and the Discovery of Cosmic Rays."
Laurie M. Brown, Northwestern University: "Terrestrial Ions, Penetrating Radiation, and the Discovery of Cosmic Rays."
Maurice M. Shapiro, Naval Research Laboratory: "The Composition and Propagation of Cosmic Ray Particles."
John A. Simpson, University of Chicago: "Cosmic Rays in the Heliosphere."
Thomas K. Gaisser, Bartol Research Foundation: "Gamma Rays and Neutrinos as Cosmic Ray Traces."

Baltimore, "How Theories Are Accepted" Tentatively scheduled for Monday afternoon May 1st, 1989. The session is being organized by C. Stewart Gillmor. The speakers include:
Stephen G. Brush, University of Maryland: "Prediction and the Evaluation of Theories by Scientists."
James T. Cushing, University of Notre Dame: "On the Nonacceptance of Viable Theories: The S-Matrix Program and Bohm's Causal Quantum Theory."
Max Dresden, SUNY at Stony Brook: "The Painful Acceptance of Gauge Ideas."
W. Peter Trower, Virginia Polytechnic Institute and State University: "Dinosaurs and the Death Star: Physicists Go Out of Bounds."

Business Meeting of the Division

Monday afternoon, May 1st following the above session in Baltimore, 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 committees or in helping to organize invited sessions of the Division, please send a curriculum vitae to the present Vice-Chairperson of the Division, Prof. Max Dresden, Institute for Theoretical Physics, State University of New York, Stony Brook, NY 11794.

Renewal Time

This is the last issue of volume III of the History of Physics Newsletter, HPN. An *index of the summaries* that have been printed in this volume is included with the summaries.

Members of the Division of History of Physics will continue to receive the future issues of this Newsletter. Those readers who are not Division members and who previously made a contribution to cover the cost of the mailing of volume IV, will continue to receive the Newsletter. Others who wish to receive the Newsletter should let us know by writing to the present editor, Albert Wattenberg (address in box on next page).

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. 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.

APS and AIP NEWS

Changes in APS Dues As reported in previous issues of this Newsletter, the question of financial support for the Divisions and other subunits of the APS has been under discussion for about two years. Proposals to limit memberships in subunits might be catastrophic to the existence of nontechnical subunits such as the History of Physics Division. However additional funds were required to take care of an increase in the number of subunits to which members of the APS belonged. This is partly due to the growth in Topical Groups.

At its meeting on October 30th, 1988, the APS Council passed a motion to increase the APS dues effective July 1st, 1989. The new schedule is as follows: Regular Annual Dues for Members and Fellows $60, Student Member dues $20, Retired Member dues $30. Dues for Membership in all Topical Groups and Divisions except the Forum and the History of Physics will be $5. The APS Bylaws require that "A motion to change the dues shall be passed at two successive meetings of Council. An announcement of such a motion shall appear in an issue of the Bulletin published before the second vote is taken." At its meeting on January 14th, the Council again considered the dues increases and approved the previously passed schedule.

CHP's International Catalog to be included in RLIN's National Database - The Center for History of Physics has been awarded a grant by the National Endowment for the Humanities for a three-year project to upgrade its International Catalog of Sources for History of Physics and Allied Sciences, ICOS, so that the records may be shared with the Research Libraries Groups Information Network, RLIN. The AIP Center's ICOS is a unique resource, at present documenting over 3000 collections in the Center's Niels Bohr Library, in other repositories, in research institutions, and in private hands; it also has plans for future deposits and information on destroyed records.

RLIN was described at some length in an earlier issue of this Newsletter, HPN vol III, No.1, pg.9. It is an online automated information retrieval system supporting the programs and requirements of a nationwide network of research libraries organized by more than sixty institutions. Searching access is available to libraries and institutions who are not members. A search-only account has recently become available to individual researchers at a rather nominal fee. The Center's ICOS records will be entered in the Archives and Manuscript Control (AMC) file of the RLIN national database and will then be available to all users of the Research Libraries Information Network. RLIN and other national library networks have a long term project to develop the software that will make their database programs compatible.

Funding of the project by the National Endowment of the Humanities will make it possible for the AIP Center to complete the automation of its old cardfile catalog, and to update and upgrade its existing information on collections. They hope to learn about new libraries with collections pertaining to the history of physics and allied sciences. They will be contacting major foreign institutions including universities and research organizations.

The AIP will continue to produce paper catalogs, and in the initial year, the sharing of information with the RLIN database will run more or less in parallel with the publication of three catalogs: A Guide to the Archival Collections of the Niels Bohr Library at the American Institute of Physics (expected publication Summer 1989), A Catalog of Sources for the History of Solid State Physics (Winter 1989), and A Catalog of Sources for the History of Laser Science and Technology (Spring 1990). For more information on the projects and its publications, contact Joan Warnow, Center for History of Physics - AIP, 335 East 45th Street, New York, NY 10017-3483.

AIP - AGU History Project - In the February 1988 issue of this Newsletter the start up of this history project was described. It is a cooperative effort of the AIP Center for History of Physics and the Committee on History of the American Geophysical Union. *Ron Doel* who has an interest in geophysics will be joining the Center early in 1989 as Postdoctoral Associate Historian. He expects to study the penetration of geophysics into university geology departments around the mid-twentieth century.

The oral interviews of the joint AIP - AGU geophysics history project are being organized. The AIP Center seeks historians of science interested in conducting interviews. For more information on the Project in the History of Geophysics, a brochure is available; write to Spencer Weart, Director of Center for History of Physics, AIP, 335 East 45th Street, New York, NY 10017-3483.

The Center for History of Physics Newsletter is published biannually (for address, see previous paragraph). The Newsletter reports activities of the Center and its Niels Bohr Library, and other information on work in history of physics and allied sciences. It is available on request without charge, but donations (tax-deductible) to the Friends of the Center for History of Physics are welcome. Three of the articles in the current

issue, November 1988, are written by university archivists.

Archival Resources at Stanford University is written by *Roxanne Nilan*; in her article there is a brief history of the Stanford physics department with references to interesting characters and very distinguished staff members. Stanford also is an important center for accelerator development as well as the microwave and semiconductor research which spawned Silicon Valley and its many industrial research laboratories. The Stanford Archives include the papers and oral interviews of the University and regional research laboratories, physicists, and engineers.

The history of the Stanford Linear Accelerator Laboratory is being collected at the laboratory. There is also the "Stanford and the Silicon Valley Project" which is acquiring material on the interconnections between academia and industry in the Santa Clara Valley; this project has received a grant from the Hewlett-Packard Company Foundation.

The archives, manuscripts, and rare books collections support an active research program in the history of science and technology. These archives and collections are cataloged on the online national database, RLIN. For more information about access to collections or their contents , one can contact Roxanne Nilan, Department of Special Collections and University Archives, Stanford University Libraries, Stanford, CA 94305; telephone (415)723-4054.

The History of Physics Sources at the University of Illinois Archives was written by *Maynard Brichford* who is one of the leading American archivists. The archival program at Illinois is twenty-five years old and has featured research especially on science documents. The archival records have been automated since 1971 and microcomputers have been used as finding aids since early 1980's. The physics collections are mainly those of U of I professors including the (1956-1974) papers of John Bardeen.

Fred Burchsted discusses the Archives of the University of Texas. As well as the collection of faculty papers, they have the Archives of American Mathematics. This serves as a national repository for papers of mathematicians and records of mathematical organizations for which local preservation is not available.

ANNOUNCEMENTS & REPORTS

Franklin Society Formed

A new society is being formed for those with a dedicated interest in Benjamin Franklin, "the good Doctor." Membership is open to all interested persons wishing to share their knowledge and to participate in endeavors to support important Franklin projects. If you are interested, please write to Friends of Franklin, 2233 Wisconsin Avenue NW, Suite 500, Washington, DC 20007.

The SLAC History Program

The Stanford Linear Accelerator Center, SLAC, is a national facility for high energy physics research, located at and operated by Stanford University. SLAC was founded in 1962, and its first accelerator which was two miles long, began operating in 1966. At the present time the facilities include two conventional electron-positron collision rings in the Gev range and a new kind of high energy (~90 Gev) electron-positron colliding-beam machine called the SLAC Linear Collider. In its 25 years SLAC has made important contributions to accelerator physics, to particle detection devices, and to particle physics research including a Nobel Prize winning experiment. The laboratory has provided facilities for more than 1700 physicists from more than 100 different institutions throughout the world.

For many years, the AIP Center for the History of Physics has been urging SLAC to set up a history program to identify and preserve records of a historical importance. About two years ago SLAC started its history program with leading roles being played by **Louise Addis** (Associate Head Librarian) and **William Kirk** (Assistant to the Director, **Burton Richter**). An initial historical database, SLACHIST, makes use of Stanford University's versatile data management system called SPIRES. They are continuing to identify important records in order to expand the database as well as to expunge records of no conceivable historical interest. Secure storage space has been equipped for archival needs, and some of the records of Panofsky and Richter have been moved into this space. For more information about the SLAC History Project, please contact **Marie LaBelle**, Archivist, Bin 97, Stanford Linear Accelerator Center, P.O. Box 4349, Stanford, CA 94305.

Gowing Elected to Royal Society

Professor Margaret Gowing has been elected a Fellow of the Royal Society. She created the Contemporary Scientific Archives Centre, and she is known for her distinguished volumes on the History of the United Kingdom Atomic Energy Project. She is also a member of the British Academy.

von Neumann Project

It was announced in the Charles Babbage Institute Newsletter, that the first phase of **William Aspray's** research project on the contributions of John von Neumann to computing and computer science is now complete. This work covers von Neumann's contributions to scientific computation, numerical analysis, and the theory of computation. One of the chapters tells the story of von Neumann's most important project in scientific computation - the first successful numerical meteorology project - with Jules Charney at the Institute for Advanced Study. The second and final phase of the project has been in progress for about a year. For more information write to

William Aspray, Associate Director of the Charles Babbage Institute, 103 Walter Library, 117 Pleasant Street, S.E., University of Minnesota, Minneapolis, MN 55455.

FY'89 Appropriations

Congress increased the appropriation for the National Endowment for the Humanities to $153 million which was about $13 million more than the President's budget. One of the factors leading to the increase was that Representative Sidney Yates fought to have NEH take a lead in dealing with the preservation of significant books and records which are deteriorating because they were published on acidic paper.

The appropriation for the National Archives is up to $121.9 million which is an increase of about $6 million from last year. This year $4 million is earmarked for the grants program of the National Historical Publications and Records Commission.

La Sociedad Latinoamericana de Historia de las Ciencias y la Tecnologia

On July 5th, 1988 in São Paulo, Brazil, the Latin American Society for the History of Science and Technology held its third General Assembly, and elected **Dr. Uburitan D'Ambrosio** as president. Correspondence concerning the activities of the organization and its newsletter should be addressed to him at Caixa Postal 6063, CEP 13.081, Campinas-SP, Brazil.

Dr. Juan José Saldaña, the former president of the society, will continue as editor of **QUIPU, Revista Latinoamericana de Historia de las Ciencias y la Tecnologia.** The journal which is published three times a year, welcomes articles in Spanish, English, Portuguese, and French. It is especially interested in articles on the diffusion of science in different cultures. Articles or correspondence for **QUIPU** should be addressed to Dr. Saldaña, QUIPU, Apartado postal 21-873, C.P. 0400, Mexico,D.F. Mexico.

Center for the History of Chemistry

Due to the generosity of **Arnold and Mabel Beckman** the Center for the History of Chemistry has a new home and has become **The Beckman Center for the History of Chemistry.** Its address is 3401 Walnut Street, Philadelphia, PA 19104-6228; it is in the heart of the University of Pennsylvania. A number of events have already been held at the Beckman Center; still to come is the Center's annual special event. It is a special symposium entitled "the Merging of Chemistry and Biochemistry" with **Paul Berg** of Stanford as the keynote speaker and other distinguished biochemists. The date is Tuesday, March 21st, 1989.

There is also a small exhibit, "Chemical Instrumentation and Physical Principles," which shows off some of the historic instruments in the Center's collection. Included are early chemical balances, interferometers, refractometers, and the Beckman pH meter which was an epoch-making application of electronics to chemical instrumentation.

Information about the Center's activities, reports, and other news about the associated societies can be obtained by writing to the Editor, Beckman Center News, 3401 Walnut Street, Philadelphia, PA 19104-6228.

Salem Press Reference Books

The Salem Press is currently sponsoring the preparation of several series of reference books, to which historians of science may want to contribute. These series include "Great Lives in History: Renaissance to 1900," "Magill's Survey of Science: Earth Sciences," and 'The Nobel Prize Winners: Physics." Information for potential contributors to these series, including lists of articles being commissioned and details about honoraria, is available from Karen M. Cleveland, Acquisition Editor, Salem Press, 150 South Los Robles Avenue, Suite 720, Pasadena, CA 91101.

Faraday's Letters

Great Britain's Institution of Electrical Engineers is supporting the preparatory work for a complete edition of the correspondence of **Michael Faraday**. Extensive collections of Faraday's letters already exist in the Archives of the Royal Institution and the Institution of Electrical Engineers. However the correspondence can be made complete only with the cooperation of the possessors of smaller quantities of Faraday's scattered correspondence. Address all information or enquiries to Dr. Frank James, RICHST, Royal Institution, 21 Albemarle Street, London WIX 4BS, England.

MEETINGS

Gibbs Anniversary Symposium: APS Topical Conference - During May 15-17, 1989, Yale University is sponsoring a commemorative scientific symposium on the 150th anniversary of the birth of J. Willard Gibbs. It is a program of invited speakers including:
S. Chandrasekhar, F. Dyson, M. E. Fisher, M. Klein, R. Langlands, P. Samuelson, A. Wightman, and *C. N. Yang*
One of the co-sponsors is the History of Physics Division of the American Physical Society which has designated the Yale symposium as a Topical Conference; the complete program should appear in the April issue of the Bulletin of the APS. For information write to The Gibbs Symposium, Physics Department, Yale University, 260 Whitney Avenue, P.O. Box 6666, New Haven, CT 06511.

XVIII International Congress of the History of Science is scheduled for 1 to 9 August 1989. It will take place in two cities of the Federal Republic of Germany, in Hamburg and Munich. From Tuesday, 1 August, until Saturday, 5 August, the venue will be in the Congress Center in Hamburg (CCH). On Sunday, 6 August, the Congress

will transfer to Munich and will be continued in the "Deutsches Museum von Meisterwerken der Naturwissenschaft und Technik" until Wednesday, 9 August 1989. The general theme of this Congress will be Science and Political Order. Additional information on this Congress was given in the previous issue of this Newsletter on page 54; the Congress Office is ICHS Congress 1989, CPO Hanser Service, Postfach 1221, D2000 Hamburg-Barbütel, FRG.

University of Ulster - The History of Technology, Science, and Society 1750-1914. A meeting is planned at the Jordanstown Campus of the University of Ulster on September 11th to 14th, 1989. The principal aims of the meeting are expected to relate to new departures in scientific thought and the fundamentals of science, and to the processes of invention, innovation and the diffusion of technological and industrial applications. For further details write to Professor R.B. Schofield, Department of Adult and Continuing Education, University of Ulster at Jordanstown, Shore Road, Newtonabbey, Co. Antrim, BT37 OQB.

International Association for Geomagnetism and Aeronomy will sponsor a meeting on "the History of Geomagnetism and Aeronomy" at Exeter, UK, during August 1989. The program will include two themes: scientific biographies in the geosciences and related disciplines, and the meteorological-geophysical work of Landsberg and Schove.

The association will also sponsor a meeting on "Problems of Uncertainties in Geophysical Time Series" at Exeter during August 1989. Enquiries about both sessions should be sent to Dr. Wilfried Schröder, Hechelstrasse 8, D-2820 Bremen-Roennebeck, FRG.

CP Violation - An International Conference is being planned at Chateau de Blois, France on May 22nd to 26th, 1989 to commemorate the "25th Anniversary of the Discovery of CP Violation." Those attending will include the team that discovered the effect: J. Christenson, J. Cronin, V. Fitch, and R. Turlay. For more information write to J. Tran Thanh Van, Rencontres de Moriond: Bâtement 211, Universitè de Paris Sud 91405, Orsay Cedex, France.

Fifty Years of Nuclear Fission will be celebrated on April 26th-28th, 1989. The first day of the conference will be held at the National Academy of Sciences, Washington, DC, and it will be devoted to an historical account of the field given by leading scientists of the time. The second and third day of the conference will be held at The National Institute of Standards and Technology (formerly the National Bureau of Standards) and will have both invited and contributed papers mainly in the form of poster sessions; the topics to be covered include theory and experiments on fission and the extensive applications of the fission process and products.

The programs for the first sessions at the National Academy of Sciences are:

Wednesday - Session A - Chairman: *E. Segrè*
E. Segrè: "Introductory Remarks"
E. Amaldi: "The Prelude to Fission"
S. Fluegge: "The Discovery of Fission"
B. Goldschmidt: "The Early French Program"
R. Peierls: "The Early British Program"
W. Zinn: "The First Chain Reaction."

Wednesday - Session B - Chairman: *G. Seaborg*
G. Seaborg: "Introductory Remarks"
P. Kuroda: "The Early Japanese Program"
J. Wheeler: "The Bohr-Wheeler Model"
B. Mottelson: "The Collective Model and Fission"
V. Strutinsky: "Shell Corrected LDM"
D. Hoffman: "Spontaneous Fission of the Heaviest Elements."

The sponsors are the National Institute of Standards and Technology and the American Nuclear Society; co-sponsors are the American Chemical Society and the American Physical Society. For information concerning the remainder of the sessions and for attendance at the sessions, contact the program chairman, Allan D. Carlson, National Institute of Standards and Technology, B112, Radp Bldg. Gaithersburg, MD 20899; (301)975-5570.

The Intellectual World of Seventeenth-Century France: Descartes in Context is the title of a conference being cosponsored by the Newberry Library Center for Renaissance Studies, the University of Chicago, and the University of Illinois on April 14th-16th, 1989. Speakers will address the issue of the historical context, particularly in early seventeenth-century France, of Descartes' philosophy, metaphysics, mathematics, and natural philosophy. For more information contact the Center for Renaissance Studies, The Newberry Library, 60 West Walton Street, Chicago, IL 60610.

Other Meetings which are scheduled to take place after April 1989 and which were described in the previous issue of this Newsletter on pages 54-55 are:
The International Conference of Chinese Scientific and Technical History (CSTH) May 5-10, 1989 in Hangzhou, China;
Joule Centenary (1889-1989) - One Hundred Years of Energy July 17-20, 1989 in Salford and Manchester, England.

BOOK PUBLISHERS

Akademie-Verlag

Robert Rompe and Hans-Jurgen Treder, **Elementarkonstanten und Was Sie Bedeuten.** The authors discuss the role of Planck's and other elementary constants in modern physics, including the contributions of Planck, Bohr, Di-

rac, Democritus and Hund. Write to Akademie-Verlag, Leipziger Strasse 3-4, Postfache 1233, DDR-1086, Berlin, German Democratic Republic.

American Nuclear Society

Bertrand Goldsmith, **The Atomic Complex**. This is a history and personal memoir from a French scientist, scholar and statesman. He covers the collaboration of the United States and Great Britain in the weapons program, and he recounts the entry of others who developed nuclear weapons capabilities. The book also examines the establishment of international controls over the development of atomic energy and non-proliferation agreements. American Nuclear Society, 555 North Kensington Avenue, La Grange Park, IL 60525.

Bantam Books

Stephen W. Hawking - **A Brief History of Time.** Hawking has made outstanding contributions to cosmological theories including the existence of a Big Bang. In the book he is most concerned with the origin of the universe and the unification of general relativity and quantum mechanics. Although the history part of the book is brief, it is a very readable and entertaining account of the role of time in physics. It is a very popular book and has remained in first place on the New York Times nonfiction best seller list for several months. Available at bookstores.

Bionomica Verlag

Johannes Stark edited by *Andreas Kleinert* - **Erinnerungen eines Deutschen Natuforschers.** Johannes Stark was a Nobel Prize winner and the most influential Nazi scientist in prewar Germany. Comparatively little has been published about him. Kleinert is reported to have been influential in convincing Stark's descendants to allow the publication of this autobiographical sketch which was written while Stark was imprisoned by occupation forces. For more information write to Bionomica Verlag, D-6951 Binau, Amlangen/Weinberg 29, West Germany.

G.N.S.F. Conference Series

F. Bevilacqua, Editor - **Atti dell'VIII Congresso Nazionale di Storia della Fisica.** This is the sixth volume in the series being published by the Gruppo Nazionale di Coordinamento per la Storia della Fisica. It contains 41 articles in the history of physics presented at the conference which began on the 29th of February 1988. The topics ranged in time from Galileo to the birth of particle physics and have an international coverage. The articles are interesting due to the perspectives being so broad including a comparison of early Chinese science to European. For more information write to Gruppo Nazionale di Coordinamento per la Storia della Fisica del C.N.R., Realiazone Editoriale Overseas s.r.l., via Moscova 44/1, Milano, Italy.

Cambridge University Press

J.B. Barbour - **Absolute or Relative Motion?** Subtitled "A Study from a Machian Point of View of the Discovery and the Structure of Dynamical Theories - Part 1: The Discovery of Dynamics" Barbour presents an original study covering the period from antiquity to Newton's - Principia including: ancient Greek astronomy, the Copernican revolution, Kepler's laws, Galileo's Discoveries, and the contributions of Descartes and Huygens. The title of the book is its central concern.

J.B. Hearnshaw - **The Analysis of Starlight.** Subtitled "One Hundred and Fifty Years of Astronomical Spectroscopy," this is a history of the analysis of starlight by astronomical spectroscopy from its beginnings in 1814, with the discoveries of Joseph Fraunhofer, up to 1965. The book explains how the classification of stars by using their line spectra developed into a major branch of astronomy in the 1890s, and traces the development of new methods in astrophysics that made possible the approximate quantitative analysis of spectral lines in the 1920s and 1930s.

Brian Vickers, Editor - **English Science, Bacon to Newton.**
Bacon, Hooke, Boyle, Newton and others are included in this anthology of seventeenth century English scientific writing. One of the issues highlighted is the development of the experimental method from the empirical to the theoretical approach.

Curtis Wilson, Editor - **The Solar System: From the Renaissance to the Nineteenth Century.** Part A: Tycho Brahe to Newton. This is published under the auspices of the International Union for the History and Philosophy of Science as a standard reference on the historical development of solar system astronomy.

Joella G. Yoder - **Unrolling Time - Huygens and the Mathematization of Nature.** This book examines the interrelationship between mathematics and physics in the work of this Dutch mathematician, physicist, and astronomer. Yoder offers a detailed account of the discoveries at the end of 1659, including the pendulum clock that theoretically kept absolute time.

Nicholas Jardine - **The Birth of History and Philosophy of Science** (Now in Paperback) Jardine offers the first translation into English of *Johannes Kepler's* - **A defense of Tycho against Ursus.** He accompanies this with essays on the background, strategy, historical sources as well as the content of *Ursus'* **Treatise on Astronomical Hypothesis** to which Kepler was replying.
For further information write to Cambridge University Press, 32 East 57th Street, New York, NY 10022.

Herman Bohlaus Nachfolger

J. W. Ritter edited by *Klaus Richter*, **Der Physiker des Romantikerkreises: Johann Wilhelm Ritter in seinen Briefen an den Verleger Carl Friedrich Ernst Frommann.** Ritter (1776-1810) is known for his contributions to the beginnings of electro- and photochemistry and in particular for the discovery of ultraviolet light. For more information write to Herman Bohlaus Nachfol-

ger, Meyerstrasse 50A, DDR-5300, Weimar, German Democratic Republic.

Imported Publications

G.E. Pavlova and *A.S. Federov* - **Mikhail Vasilievich Lomonosov: His Life and Work.** Translated by *Arthur Aksenov* Translation edited by *Richard Hainsworth.* M.V. Lomonosov (1711-1765) is considered the Father of Russian Science. He brought to Russia an awareness of the scientific developments of the eighteenth century. This book tries to summarize why he is a scientific and humanistic legend in Russia. Distributed in the U.S. by Imported Publications 320 W. Ohio Street, Chicago, IL 60610

Iowa State University Press

Stephen G. Brush - **The History of Modern Science.** The book covers key developments in the major fields of science during the second scientific revolution, 1800-1950. It is for scientists, teachers of history of science, and their students. Einstein and his theories play a major role in the section on electromagnetism and relativity. Other chapters cover atomic structure, nuclear physics, and the bomb. This book is part of the Iowa State Press Series in the History of Technology and Science. For more information write to Iowa State University Press, 2121 S. State Avenue, Ames, Iowa 50010.

University of Chicago Press

Ronald N. Giere - **Explaining Science: A cognitive approach.** Giere sees the choice of one theory over another as the result of scientists' decisions based on judgements that are often reflected in the way experiments are designed. This is at odds with those philosophers of science who have the view that scientific theories are sets of universal generalizations organized axiomatically. Giere uses case studies of nuclear physics and "plate tectonics" and suggests a way toward an empirical "science of science." Write to University of Chicago Press, 5801 South Ellis Ave., Chicago, IL 60637.

Universita' degli Studi di Pavia

Giacomo Bruni Editor - **La Fisica a Pavia Nell' 1800 e '1900: Scritti di Giuseppe Belli** This is a collection of the extensive writings of Giuseppe Belli (1791-1860) who was director of the Physics Institute from 1842 to 1860. He is best remembered for his electric induction machine and the magnetoelectric motor. It gives some idea of Italian physics between Volta and Fermi.Write to 1988 Overseas s.r.l., via Moscova 44/1, Milano, Italy.

RECENT & FUTURE ARTICLES

American Journal of Physics

May 1988:
"Henry Cavendish, Johann Von Selden, and the deflection of light" by *Clifford M. Will.*
November 1988:
"The division of Martian eccentricity from Hipparchos to Kepler: A history of the approximations to Kepler motion" by *James Evans.*

Annals of Science

September 1988 is a special issue devoted to Newton; it contains:
"Newton's Mature Dynamics: Revolutionary or Reactionary?" by *J.B. Brackenridge.*
"Leibniz's Excerpts from the Principia Mathematica" by *D.B. Meli*
"Newton and Goethe on Colour: Physical and Physiological Considerations" by *M.J. Duck.*
"Leonhard Euler's 'Anti-Newtonian' Theory of Light" by *R.W. Home.*

European Journal of Physics

Volume 9 number 3 1988 contains:
"Grand Schools of Physics: Physics in Göttingen with Franck, Born, and Pohl" by *F. Hund, H. Mater-Leibnitz,* and *E. Molluo.*
"Grand Schools of Physics: Berkeley, a Lab like no other" by *L.W. Alvarez.*
Volume 9 number 4 1988 contains:
"Grand Schools of Physics: Physics at the University of Oxford" by *B. Bleany.*

Il Nuovo Saggiatore Bolletino Della Società Italianna di Fisica
Maggio-Giugno 1988 contains:
"Il Dualismo Onda-Corpuscolo Secondo Einstein e De Broglie" by *Franco Selleri.*
"Giovanni Polvani e l'Istituto di Milano" by *Lafranco Belloni.*

Foundations of Physics

July 1988:
"David Bohm and his Work on the Occasion of his Seventieth Birthday" by *Max Jammer.*

Nuclear Instruments and Methods

April 1988 Research Section A contains: "Synchrotron Radiation -1873 to 1947" by *J.P. Blewett.*

Osiris

Volume 4 1988 contains:
"Research Traditions, Lavoisier, and the Chemical Revolution" by *C.E. Perrin.*

Physics Today

November 1988:
"Pions to Quarks: Particle Physics in the 1950s" by *L.M. Brown, M. Dresden,* and *L. Hoddeson.* As high-energy nuclear physics became particle physics, revolutions occurred not only in models and techniques but also in social organization.

Science, Technology, & Human Values

Summer/August 1988 contains:
"Technology Assessment and the Study of History" by *Eda Kranakis.*

Scientific American
January 1989:
"André-Marie Ampère" by *L. Pearce Williams*. The first investigator to quantify the magnetic effects of electric current, Ampère was also a pioneer in the philosophy of science. His philosophy shaped his method of scientific discovery.

Sylva Clius - Revista de Historia de la Ciencia
The first issue of this new Review of History of Science was published in 1987. Articles for this review should be sent to Javier Ordoñez, Apartado de Correos 4070, 28005 Madrid. All articles are in Spanish.
Issue number 2, October 1987 contains:
"Tres eran tres...," by *Eloy Rada*.
"La Tercera Ley de Newton y la Gravitaciòn Universal" by *I. Bernard Cohen*.
"La Fuerza de Dios y el `Eter de Cristo" by Carlos *Solis*
"La Recensiòn de los Principia Newtonianos en el Journal des Sçavans" by *Alberto Elena*.

GRANTS & FELLOWSHIPS

American Council of Learned Societies

The ACLS has two categories of fellowships both of which are designed to help scholars devote six to twelve continuous months to full-time research. The one category of Fellowship may be of particular interest to scholars whose teaching loads restrict time for research, those whose normal places of work are remote from repositories of research materials, and those independent scholars who have no institutional support for their research and writing. These Fellowships do not exceed $15,000 and are intended primarily as salary replacements for the provision of time free for research. The ACLS Fellowship stipend, plus any sabbatical salary and other grants, may not exceed the candidate's normal academic year salary.

The second category is a Fellowship for recent or anticipated recipients of the Ph.D. degree. Proposals for dissertation revision as well as those for other projects are appropriate. Recent Recipients Fellowships do not exceed $10,000 and are intended primarily as salary replacement for the provision of time free for research. In previous years the deadline for receipt of completed application forms has been September 30th. Application forms for programs administered by the ACLS should be requested in writing from the Office of Fellowships and Grants, ACLS, 228 East 45th Street, New York, NY 10017-3398. Application requests should contain the following: your highest degree, citizenship, academic or other position, field of specialization, subject of research, proposed date for beginning, and specific award program.

Institute for Advanced Study School of Historical Studies

Visiting Member Awards are made each year to both senior and junior scholars. Candidates must have the Ph.D. degree or its equivalent. Application from those who have their own support are also welcome. This year the deadline for receipt of applications was October 15th.

The **New Membership Program** will support promising young scholars who have embarked on professional careers and plan to return to their positions. (Written assurance is required from their dean or department head that they may return to their positions.) Applications may be made by assistant professors who have served at least two years and not more than four at a U.S. or Canadian institution of higher learning. Appointments will be for two successive academic years. The stipend will be the same (including benefits) as the salary in the member's home institution. This year the applications were due by November 1st. Details of the material required for submission of an application may be obtained from the Administrative Officer of the School of Historical Studies, Institute for Advanced Study, Olden Lane, Princeton, NJ 08540.

Institute of Electrical and Electronics Engineers, Inc.

Fellowships in Electrical History - One fellowship is awarded annually either for one year of full-time graduate work in the history of electrical engineering and technology or for up to one year of post-doctoral work in the same field. The stipend for graduate students is $8,500 plus $2,000 for tuition and fees. Post-doctoral recipients receive $10,500. Selection is based on the candidates potentional for contributing to the field and pursuing research. Applicants studying the history of science and technology may apply. Write to Institute of Electrical and Electronics Engineers, History Fellowship Committee, Center for the History of Electrical Engineering, 345 East 47th Street, New York, NY 10017. Tel: (212) 705-7501

National Endowment for the Humanities

NEH "Overview" - Those who have an interest in support for themselves or a project are urged to obtain a copy of the NEH "Overview." It provides information on the NEH Fellowships, Grants, and Programs as well as their deadlines and the appropriate contacts at the NEH. Free copies can be obtained by writing National Endowment for the Humanities, NEH "Overview," Room 406, 1100 Pennsylvania Avenue, Washington, DC 20506. Room 406 is the Office of Publications and Public Affairs where one can obtain descriptive material and guidelines for NEH programs. To obtain application forms, you should write to the appropriate Endowment division or office, describing briefly the proposed project, and request guidelines and application forms.

NEH Fellowships afford individual scholars, teachers, and other interpreters of the humanities opportunities to undertake study research, or independent work for periods ranging from several weeks to one year. The Fellowships for University and College Teachers and for Independent Scholars were described on page 59 of the previous issue of this Newsletter. This is a reminder that the application deadline for these Fellowships is June 1, 1989. Write or call the National Endowment for the Humanities, Room 316, 1100 Pennsylvania Avenue, N.W., Washington, DC 20506. Tel: (202)786-0466.

Division of Education Programs - Through grants to elementary and secondary schools, two- and four-year colleges and universities, academic and professional associations, and other educational institutions, this division supports projects designed to improve education in the humanities at all levels. **Higher Education in the Humanities Grants** support a variety of activities including: institutes, national conferences, curriculum development efforts, and various types of faculty programs. Cooperative efforts are particularly encouraged among faculty and administrators from one or several institutions. The application should be from an institution; the deadline is April 1, 1989. Write to room 302. Tel: (202)706-0380.

The **Travel to Collections Program** provides grants of $750 to assist American scholars to meet the cost of long-distance travel to the research collections of libraries, archives, museums, or other repositories throughout the US and the world. The application deadlines are July 15th for travel between December 1st and May 31st, and January 15th for travel between June 1st and November 30th. For application materials write to Travel to Collections Program, Division of Fellowships and Seminars, Room 316. Tel: (202) 786-0463.

National Science Foundation

Studies in Science, Technology & Society - Research in History and Philosophy of Science & Technology (HPST) supports research on the nature and processes of development in science and technology, the impact of science and technology on society, and the nature of theory and evidence in different scientific and technological fields. The support is available through:

1) **NSF Scholars Awards** which normally provide support of an individual researcher for part or all of an academic year, for summer research, or for some combination of the two.

2) **(HPST) Grants** are for larger projects which require several investigators, collaboration among principal investigators, post doctoral researchers, or graduate students.

3) **Post Doctoral Fellowships or Professional Development Awards** (Details are given on page 59 of the previous issue of this Newsletter.)

4) **Grants for Doctoral Dissertation Research Support** for extraordinary expenses of dissertation research. For information on Dissertation support, obtain "Grants for Improving Doctoral Dissertation Research" NSF 88-35.

This year revisions were announced:

1) A **Summer Scholars Award** consisting of awards up to $10,000 for partial support of full time research and/or related costs;

2) A **NSF Scholars Award** consisting of awards up to $40,000 for partial support of one or more semesters (or quarters) of full time academic year release time and related expenses. Budgets for less than these amounts may be submitted, and the NSF may also negotiate changes in amounts. It is expected that the investigator will devote a minimum of one semester (or quarter) full time to the research under the NSF Scholars Award. Proposals may be submitted through normal institutional channels in accordance with the Guidelines for Research and Education in Science and Engineering, (GRESE, NSF 83-57, rev. 11/87.) Target dates for submission of proposals are August 1st and February 1st. Details on submission of the many copies of the proposal are given in NSF 88-72. For information about HPST awards, contact Program Director, Studies in Science, Technology and Society (HPST), National Science Foundation, 1800 G St. NW, Washington, DC 20550. Tel: (202) 357-9844.

NSF Historical Monographs - The NSF is planning a series of historical monographs in subject areas supported by the NSF; each monograph will provide a scholarly analysis including the successes and failures of funded projects. The program will operate by competitive awards of contracts of two or three years. "Requests for Proposals" will be sent to those interested when the funds become available. To receive the "Requests for Proposals," send your name , address, and telephone number to George T. Mazuzan, NSF Historian, National Science Foundation, 1800 G Street, NW, Washington, DC 20550. Tel: (202) 357-9838.

Northwestern University - Postdoctoral Fellowships

Last year, Northwestern University announced a program of graduate study and postdoctoral research designed to train scholars who wish to specialize in the history and/or philosophy of science. The program draws on faculty from the departments of History, Philosophy, and Physics (for the history of recent physics), who organize a weekly colloquium series along with special courses, seminars, and workshops. Postdoctoral Fellowships are for recent Ph.D.s who wish time for research, writing, or retraining in the history or philosophy of science. Each fellow will be asked to teach one class or workshop during the year and to participate in other activities of the program. Last year the stipend was $22,000, and the deadline was April 1st. Special fellowship support is also available for graduate study; the program operates within the regular doctoral requirements of each of the departments of History, Philosophy, or Physics. To obtain details of the material required for an application write as early as possible to Program in History and Philosophy of Science, c/o Department of Philosophy, Northwestern University, Evanston, IL 60208.

Rockefeller Archive Center

Grants in Aid 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 have been December 31st of the year preceding the award. An introduction and general guide to the material available for research at the Center is "Archives and Manuscripts In the Rockefeller Archive Center, 1984" with accessions for more recent years appended. 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. One of the recipients of a 1988 grant in aid was *William Lanouette* for work on a biography of Leo Szilard.

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.

SUNSPOTS 1618

Baumgartner, Frederic J., *Sunspots or Sun's Planets: Jean Tarde and the Sunspot Controversy of the Early Seventeenth Century*, Journal for the History of Astronomy, 1987, 18: pp.44-54.

This article examines the sunspot theory of Jean Tarde, a French cleric who visited Galileo in 1614 and heard about the discovery of sunspots. Returning to Gascony, Tarde in 1618 published his theory that the spots were created by numerous tiny planets, which could only be seen as they made their transits across the sun. Like Christopher Scheiner, Tarde placed his "Bourbon stars" in orbit between the Sun and Mercury. The author argues that Tarde was a 'constructive conservative," willing to accept telescopic data as real but determined to interpret them in a way consistent with traditional cosmology. In this case, the principle in question was the perfection of the Sun. Author's address: Dept. of History, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061.

HIGH POWER LASERS

Hertzberg, A., *A Historical Perspective of Early High Power Gas Laser Research*, 737 pp., New York: American Institute of Physics Proceedings 160, (2nd ILS Conference), 1987.

The introduction of the gas laser in 1959 attracted the attention of workers in related fields of high energy gas dynamics as well as chemical and optical physics. Much of the science base created by gasdynamic research was applicable to laser physics. It was quickly recognized that flow could be used to create population inversions or to improve laser operation. At the present time, most gas lasers which are capable of continuous high average power employ flow as an indispensable aspect of their operation. The author was fortunate enough to play a role in the development of lasers of this type and his paper recalls some of the pure excitement and fun he and his colleagues experienced during this period.

SCIENCE AT COURT

De Clercq, Peter, *Science at Court: the Eighteenth-Century Cabinet of Scientific Instruments and Models of the Dutch Stadholders*, Annals of Science, 1988, 45, pp. 113-152.

Prince William IV of Orange-Nassau (1711-1751) and his son William V (1748-1806) were the last stadholders to reign in the Dutch Republic. They owned a cabinet of mathematical, optical and physical instruments and of mechanical and other models. These were included with the library collection and after 1766 were housed, together with the other collections (paintings, medals and antiquities, natural objects and rarities), in a building opposite the stadholder's quarter in The Hague. There was also an astronomical observatory. In 1795, the stadholder's cabinet fell victim to the French "scientific conquest" and was transported to Paris. The instruments and models probably shared the fate of the seized cabinets of the émigrés, being merged into the newly founded Conservatoire des Arts et Métiers, the École Polytechnique or some provincial school or college.

THE DRAGON'S TAIL

Hacker, B., *The Dragon's Tail: Radiation Safety in the Manhattan Project, 1942-1946*, x+258 pp., Berkeley: University of California Press, 1987.

The advent of controlled nuclear fission and then atomic bombs in the Manhattan Project transformed the scope and nature of radiation hazards. Nuclear energy for war required huge plants of novel design and unprecedented kinds of field testing, not only multiplying a thousandfold the number of workers at risk, but also threatening large numbers of nearby residents. Despite unresolved conflicts between secrecy, science and safety, the Manhattan Project largely met its responsibility to protect workers and the public against undue danger at the 1945 Trinity test in New Mexico and the 1946 Crossroads tests at Bikini. Prewar safety standards and practices devised over nearly half-a-century of trial and error for coping with the known hazards of gamma rays, radium, and radon proved adaptable to Manhattan Project needs. Radiation safety faced new demands, political as well as technical, when nuclear weapons testing became a public issue in the 1950's. This will be the subject of another volume.

THE SECOND LAW

Tansjö, Levi, *Comment on the Discovery of the Second Law*, American Journal of Physics, 1988, 56, pp. 179-182.

William Thomson (later Lord Kelvin) demonstrated in 1851 the Carnot Theorem and asserted that he was unaware of the work of Rudolf Clausius, who had demonstrated the theorem one year before. In the note Thomson's assertion of independence is questioned since there is evidence that he had read Clausius' paper already in September or October 1850. For reprints: L. Tansjö, Chemical Center, University of Lund, PO Box 124, S-221 00 Lund, Sweden.

NUCLEAR FEAR

Weart, Spencer, R., *Nuclear Fear: A History of Images*, 544 pp., Cambridge: Harvard University Press, 1988.

An exploration of the historical roots of how people think about nuclear energy, including both weapons and civilian applications. This is not a conventional political or social history, but digs into what such histories omit: the images that have become associated with nuclear energy, from mad scientists and exploding planets to magical mutants and utopian atomic cars. The history is covered from the turn of the century to the 1980's, with a look back at still earlier roots of the imagery. The psychological forces that give the images their power are briefly investigated. More important, the book describes how nuclear images have been reinforced (deliberately or not) by journalists, artists, politicians and others, and suggests how the images in turn have had little recognized but powerful effects upon historical decisions.

KEPLER'S COSMOLOGY

Field, J.V. *Kepler's Geometrical Cosmology*, xx+243 pp., Chicago: University of Chicago Press, 1988.

As a deeply religious, if not quite orthodox, Lutheran and a convinced Platonist, Kepler saw the (observable) Universe as the outward expression of the nature of the Christian God. The Copernican theory, of which he was a lifelong advocate, provided him with the tools for constructing a precise mathematical cosmology in good agreement with astronomical observation. This was the first such cosmology to be constructed in modern times. Kepler saw it as an argument for the Copernican theory. This book discusses the Platonic, Euclidean, and Ptolemaic foundations of Kepler's cosmological models, as well as their connections with his other works. It contains fairly detailed analyses of his two principal cosmological works: *Mysterium cosmographicum (1596, 1621)* and *Harmonices mundi libri V (1619)*, both of which are concerned with geometry, astrology, and music as well as with astronomy. Author's address: Science Museum, London SW7 2dd, U.K.

SZILARD'S WRITINGS

Hawkins, Helen S., Greb, Allen G., and Szilard Gertrud Weiss, (Editors) Foreword by Norman Cousins. Introduction by Barton J. Bernstein. *Toward a Livable World: Leo Szilard and the Crusade for Nuclear Arms Control*, 484 pp., Cambridge, Mass.: MIT Press, 1987

Leo Szilard was a physicist who conceived of the possibility of a self-sustaining nuclear chain reaction years before it was achieved in the laboratory. He was a prime mover in the atomic bomb project in the United States. At the end of World War II he became an active proponent of nuclear arms control and turned his scientific attention to biology. This book, a collection of Szilard's writings with introductory editorial comment putting his ideas and activities into historical context, is the third volume in a series of Szilard's collected works. It documents his efforts to influence public policy on arms control and disarmament issues, during the period from 1947 to his death in 1964. Many of the ideas Szilard expresses in these documents are still crucial today, such as his opposition to antiballistic missile systems, his proposal for a Washington-Moscow "hot line," his work on the Pugwash conferences, his pivotal role in the creation of the Council for a Livable World, his advocacy of a nuclear policy of no-first-use and restricted retaliation, and his support of "minimum deterrence" in place of an overwhelming counterforce capability.

GALILEO'S FRENCH FRIENDS

Baumgartner, Frederic J., *Galileo's French Correspondents*, Annals of Science, 1988, 45: pp. 169-182.

This article examines the correspondence and contacts between Galileo and a number of French intellectuals. It demonstrates that exchanges between Galileo and those Frenchmen did much to stimulate an interest in new scientific ideas in France, especially in astronomy. Several of the Frenchmen were active in his support after his condemnation of 1633 and in publishing his works. The article further shows the extent of the network of intellectuals who corresponded with Galileo and each other across Europe in the early seventeenth century. Author's address: Dept. of History, Virginia Polytechnic Institute & State University, Blacksburg, VA 24061.

HISTORIOGRAPHY

Kragh, Helge, *An Introduction to the Historiography of Science*, 250 pp., Cambridge/New York/Melbourne: Cambridge University Press, 1987.

The book deals with basic problems of history of science and offers a critical review of significant historiographical viewpoints. The subject-matter is historiography of science in general, not the history of any particular discipline or any particular period. It includes a discussion of, among other things: General theory of history of science; periodization; ideological functions; anachronisms; the critical use of sources; experiments in history of science; quantitative history of science. The book's discussion of key problems in history of science is illustrated with examples drawn from a wide range of disciplines. Although it does not deal primarily with the history of the physical sciences, many of the examples reflect the author's background in history of physics and chemistry. Case-studies, used to illuminate methodological problems, include Galileo and the experimental method, the origin of special relativity, the discovery of aluminum, Dalton's atomic theory, and the discovery of X-ray diffraction in crystals.

SETI

McDonough, Thomas R., *The Search for Extra-Terrestrial Intelligence*, xi+244 pp., illus., New York: John Wiley & Sons, 1987, $19.95 (hardcover), $14.95 (trade paperback).

A nontechnical survey of the history and future of the search for extraterrestrial intelligence (SETI) by a participant. The topics are: from Copernicus to Lowell; early searches for extraterrestrial life; the evolution of science fiction; Darwinian evolution and the creationism controversy; the Alvarez theory of the extinction of dinosaurs; false alarms in the search for planets around other stars; the first modern SETI; the search for life in the solar system via spacecraft; false alarms and controversies, including the discovery of pulsars; congressional opposition to SETI; SETI at Ohio State University, the Planetary Society, the USSR, and elsewhere; opposition to SETI; future plans; possible consequences of success or failure of SETI; history lessons from clashes between human cultures.

METEORITES

Burke, John G., *Cosmic Debris: Meteorites in History*, x+445 p., illus., Berkeley: University of California Press, 1986.

This book is an account of the development of meteoritics, which now attract the investigative activity of scientists from numerous disciplines. Most 18th century scientists on theoretical grounds doubted that meteorites fell. When acceptance occurred about 1800, they speculated that meteorites were either atmospheric concretions or ejecta from lunar volcanos. Progressive understanding of the phenomena of meteor showers demonstrated that meteors and fireballs came from interplanetary or cosmic space and convinced 19th century astronomers and physicists that meteorites were cometary fragments. Chemists and mineralogists, looking at composition and structure, argued that they must be the debris of a destroyed planet. After 1950, advances in nuclear physics and improved laboratory techniques permitted fairly precise determination of the ages of meteorites and shifted scientific attention to the asteroids as sources.

HISTORIANS' CRITICISMS

Harrison, Edward, *Whigs, Prigs, and Historians of Science*, Nature, 1987, 329, pp.213-214.

To many scientists the history of science is what the name implies: the origin, development, and excitement of scientific ideas. Into this grand enterprise is interwoven the history of societies and the

biography of individuals. Many historians of science, however, have transformed the history of science into what the name does not imply: the history of scientists. Trained in the social sciences, these historians condemn the scientist's view of the history of science as a whig interpretation that tends to discard from the past what contributes nothing to the present. Instead, at the other extreme, these historians themselves tend to discard from the present what contributes nothing to the past. Undoubtedly, history judiciously combines the deductive and the inductive methods, and when studying the past, we find that both methods unavoidably have their retrospective (or hindsight) elements. Historians of science trained in the social sciences customarily deride the deductive method as whiggish, but by stressing the Baconian inductive method, and making a virtue of ignorance of modern science, they fail to appreciate the temporal depth of scientific research and expose themselves to the countercharge of being priggish.

FRENCH SCIENCE OUTSIDE PARIS

Nye, Mary Jo, *Science in the Provinces. Scientific Communities and Provincial Leadership in France, 1860-1930*, xi+328 pp., tables and illustrations. Berkeley, Los Angeles, and London: University of California Press, 1986.

It is common wisdom that the most important scientific work in France has occurred in Paris. It is argued here that provincial scientists and administrators often took the lead in developing innovative research and institutional programs and that science in the French provinces enjoyed a special vitality in the years 1880-1910. Concentrating on university science, Nye demonstrates how local economic and cultural interests resulted in important provincial strengths, especially in physical and organic chemistry and in electrical physics and engineering, in the cities of Nancy, Grenoble, Lyon, Toulouse, and Bordeaux. The joint award in 1912 of the Nobel Prize in Chemistry to Victor Grinard and Paul Sabatier became a powerful symbol of provincial achievement. The scientific biographies of Grinard and Sabatier, as well as accounts of the chemist François Raoult and the physicists René Blondlot and Pierre Duhem provide concrete illustrations of differing dimensions of provincial scientific careers. The book includes an analysis of Blondlot's claim of the discovery of "N-Rays."

IONOSPHERIC PHYSICS

Schröder, Wilfried (Editor) *Mitteilungen Arbeitskreis Geschichte der Geophysik* (History commission of the German Geophysical Society). 1987 No. 1-3 and 1988 No. 1.

The "Mitteilungen" deals with the development of ionospheric physics in Germany since 1920. Papers by the pioneers of ionospheric research (Walt Dieminger, Karl Rawer and Kurty Eyfrig) are published; they show in detail the developmental phases of German ionospheric research between 1920-1945. Further papers deal with the work by Adrian Gill, Flamsteed's suggestion on earthquakes, the life and work of A. Tarczy-Hornoch and the scientific work of Reimar Lüst with a bibliography of his scientific papers. Editors address: Dr. Wilfried Schröder, Hechelstrasse 8, D-2820 Bremen-Roennebeck, Federal Republic of Germany.

RESEARCH MANAGEMENT

Levine, Arnold and Mark, Hans, *The Management of Research Institutions (a look at government laboratories)*, Washington, D.C.: National Aeronautics and Space Administration, 1984.

Research institutions sponsored by governments have been a feature of western nations for over four hundred years. These research institutions differ substantially from university based research establishments. Government sponsored research institutions are generally not concerned with expanding disciplinary knowledge which is the function of university research. Government research establishments tend to be mission oriented, that is, they are established usually to accomplish some well defined specific end. Government research institutions also tend to be multi-disciplined in that they apply knowledge from many different areas to the achievement of specific objectives.

The organization of the institutions is discussed in detail with special emphasis on personnel management and financial management. Personnel management is particularly important since the quality of the institution depends primarily on its ability to attract and hold excellent people. There turn out to be certain uniformities that help sort out management problems. Programmatic aspects of institutions are also discussed with particular emphasis on how the missions evolve in time. The choice of programs and their execution is the single most important and difficult problem that institutional management must deal with in the long term. It is the execution of programs that determines the relationship of the institution with the sponsoring agency and, therefore, its general overall health.

BHABHA'S PAPERS

Sreekantan, B. V., Singh, Virendra, Udgaonkar, B.M. (Editors) *Homi Jehangir Bhabha: Collected Scientific Papers*, Bombay, Tata Institute of Fundamental Research, 1984.

Homi Jehangir Bhabha made pioneering contributions in the field of cosmic rays, theory of elementary particles and mathematical physics. His most celebrated works are the famous Bhabha-Heitler cascade theory and Bhabha Scattering. He was one of the early influential workers on meson theory. The test of relativistic time dilation involving meson lifetime is due to him. He initiated major programs of cosmic ray research in India. In his later life Bhabha became equally distinguished as a builder of scientific institutions and as one who created opportunities for advancement of science and technology in India. He founded the Tata Institute of Fundamental Research in 1945 and was its Director till his death in a tragic plane crash on January 24, 1966. The Institute served as the cradle for the development of the Indian atomic energy program. Dr. Bhabha is regarded as the "father of the atomic energy program of India." The space program of India was initiated in the Department of Atomic Energy, when Bhabha was the Chairman of the Atomic Energy Commission. Three introductory articles highlight Bhabha's contributions in the historical context in which they were carried out. The commemoration articles in the appendix portray the multidimensional personality of Dr. Bhabha and his significant achievements in a variety of fields.

14th CENTURY MEMORIA

Maieru, A.; Bagliani, A. Paravicini (Editors) *Studi sul XIV Secolo in Memoria di Anneliese Maier*, 556 pp., Rome: Edizioni di Storia e Letteratura, 1981.

Includes: J. E. Murdoch, E. Sylla, "Anneliese Maier and the History of Medieval Science"; E. Grant, "The Medieval Doctrine of Place: Some Fundamental Problems and Solutions"; J. A. Weisheipl, "The Spector of *Motor Coniunctus* in Medieval Physics"; E. D. Sylla, "Godfrey of Fontaines on Motion with Respect to Quantity of the Eucharist"; N. Kretzmann, "Richard Kilvington and the Logic of Instantaneous Speed"; W. A. Wallace, "Galileo and Scholastic Theories of Impetus."

AUTHORS OF SUMMARIES IN VOLUME III

DIVISION ELECTION

NOMINEES FOR THE 1989 DIVISIONAL ELECTION

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

For Vice-Chairperson

Allan Franklin

Allan Franklin is a Professor of Physics at the University of Colorado. He received his A.B. from Columbia College and received his Ph.D. from Cornell University. He began his career as an experimental high-energy physicist, and performed experiments at Cornell, PPA, Brookhaven, and SLAC. Since 1975 he has worked on the history and philosophy of science, concentrating on the role of experiment in physics. His historical studies have included the discovery of parity nonconservation, the discovery of CP violation, Millikan's oil-drop experiment, and the history of weak interactions from Fermi to V-A. On the philosophical side he has worked on the legitimate role experiment plays in science, confirmation theory, and the epistemology of experiment, strategies for reasonable belief in experimental results. He has also worked on the history of medieval science. His most recent book is The Neglect of Experiment (Cambridge University Press, 1986).

Silvan S. Schweber

Silvan S. Schweber received his Ph.D. from Princeton in 1952. Until the early 70's his research was in quantum field theory and elementary particle physics. Since the mid seventies his interests have shifted to the history of science. A manuscript has been completed on the history of quantum field theory from 1927-1952 which also addresses the wider context. It includes a history of the emergence of the American theoretical physics community from 1919-1952. In recent years he has been very much concerned with the incorporation of the history of science into the undergraduate and graduate curriculum. He has been teaching courses on the history of science in the History Department and a course on the history of physics in the 20th century designed for the graduate students in the Physics Department.

For Executive Committee

Laurie M. Brown

Laurie M. Brown is a Professor of Physics and Astronomy at Northwestern University, where he has been a faculty member since 1950. Born in 1923, Brown received his A.B. and Ph.D. in Physics at Cornell University. He has been a Member of the Institute for Advanced Study in Princeton (1952-53), Fulbright Research Scholar in Italy (1958-60), and Visiting Professor at Rome, Seattle, Sao Paulo, and Keoio University in Yokohama, as well as International Atomic Energy Agency Professor in Vienna. He is a Fellow of APS and AAS and a founding member of the APS Division of History of Physics. He was Chairperson of the Division for 1983-84. His published research articles have been in the fields of quantum field theory and elementary particle theory. Since ten years ago, most of his articles have been on the history of physics in the twentieth century, especially on fundamental theories of nuclear forces, including the meson theory. As part of a US-Japan team, he organized an ongoing investigation into Japanese particle physics since 1930; this has uncovered much new archival material. He has also been one of the principle organizers of two international symposia at Fermilab on the history of particle physics, and co-editor of the proceedings for Cambridge University Press.

James T. Cushing

James T. Cushing is Professor of Physics at the University of Notre Dame, where he has been a faculty member since 1966. He received his Ph.D. in theoretical physics in 1963 at the University of Iowa. He did (NSF) postdoctoral work at Imperial College, London, and at Argonne National Laboratory. His published research was concentrated in high energy theoretical physics and in mathematical physics until about 10 years ago. He has written a graduate text, Applied Analytical Mathematics for Physical Scientists (Wiley, 1975). During the last decade, his interests have shifted to the history and philosophy of physics, primarily that of the present century with an emphasis on current research in theoretical physics. His work includes "Electromagnetic Mass, Relativity, and the Kaufmann Experiments" (Am. J. Phys., 1981) and "Models and Methodologies in Current Theoretical High-Energy Physics" (Synthese, 1982) and "The Importance of Heisenberg's S-Matrix for the Theoretical High-Energy Physics of the 1950's" (Centaurus, 1986). His general area of research is centered around historical and philosophical questions connected with the acceptance of scientific theories [PSA 1982, Vol. 2, PSA 1984, Vol. 1, Stud. Histo. Phil. Sci. (1985), PSA 1986, Vol. 1]. He is on the editorial board of the series

Science and Philosophy (Kluwer Academic Publishers) and has recently completed a book, The Construction, Selection and Justification of a Scientific Theory: The S-Matrix Program (to be published by Cambridge University Press).

Kenneth Ford

Kenneth Ford is Executive Director of the American Institute of Physics. He received his undergraduate degree in physics at Harvard College (1948) and his Ph.D. in theoretical physics at Princeton University (1953). He has held faculty positions at Indiana University, Brandeis University, and the University of Massachusetts-Boston. He served as the first Chair of the Physics Department at the University of California, Irvine, and was President of New Mexico Institute of Mining and Technology and Executive Vice President of the University of Maryland. His research was in nuclear structure theory and field theory. He is the author of a book for the general reader (The World of Elementary Particles), a textbook for non-science students (Basic Physics), and a three-volume text for science and engineering students (Classical and Modern Physics). In his books, he has tried to avoid standard mythology and to include some real history. At AIP, he is encouraging the work and growth of the Center for History of Physics. Ford is a Fellow of the American Physical Society and of the American Association of the Advancement of Science. He has served as President of the American Association of Physics Teachers and Chair of the APS Forum on Physical Society.

Stanley Goldberg

Stanley Goldberg is a Consultant to the Department of the History of Science and Technology at the Smithsonian's National Museum of American History and he is Visiting Professor of History at the University of Maryland Baltimore County. His book, Understanding Relativity: Origins and Impact of a Scientific Revolution appeared in 1984. He is co-editor (with Roger Stuewer) of American Science in the Age of Michelson. He is principle investigator for the Smithsonian's Video History Program series on the Manhattan Project. His articles "Physics Poetry and Politics: Sam Goudsmith and American Science after World War II," and "Before the Manhattan Project: The Decision to Build the Bomb" will soon be published.

1989 BALLOT

The ballot must be returned by April 14th, 1989, to Professor C. Stewart Gillmor, Department of History, Weleyan University, Middletown, CT 06457

Vice-Chairperson--Vote for ONE

☐ ALLAN FRANKLIN

☐ SILVAN SCHWEBER

Executive Committee--Vote for TWO

☐ LAURIE BROWN

☐ JAMES T. CUSHING

☐ KENNETH W. FORD

☐ STANLEY GOLDBERG

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