

History of Physics Newsletter

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DIVISION NEWS

MEETINGS

The Division is sponsoring sessions of invited papers at two APS meetings during the early part of 1985: Toronto (21-24 January) and Washington (24-27 April). The theme for the Toronto session (being arranged by John Rigden) will be "Biographies of Physicists"; details will be in the *APS Bulletin*. There will be two Niels Bohr Centennial sessions at the Washington meeting, and the annual Business Meeting of the Division will be held at that time. Details will be announced in the next issue of HPN.



ELECTION RESULTS

Robert E. Schofield has been elected Vice-Chairperson of the Division of History of Physics for 1984. He will serve as Chairperson in 1985. Schofield is Professor of History of Technology and Science at Iowa State University, Ames. He received his B. A. in Physics from Princeton, his M. S. in Physics from the University of Minnesota, and his Ph. D. in History of Science from Harvard. He taught at the University of Kansas and Case Western Reserve before coming to Iowa State in 1979. He has been a Fulbright Fellow, a Guggenheim Fellow (twice), and a Member of the Institute for Advanced Study. His areas of research interest are: 18th-century natural philosophy, especially British; Newtonianisms; Joseph Priestley as a

natural philosopher; and cultural history of science. His book on the Lunar Society of Birmingham received the Pfizer Award in 1964; he has also published books on British natural philosophy in the 18th century, a biography of Stephen Hales (co-author), some 40 papers and many book reviews.

The Division also elected Paul Forman and Norton Wise to 3-year terms on its Executive Committee.

Forman is Curator of Modern Physics at the Smithsonian National Museum of American History in Washington, DC. Forman received his B. A. in Physics at Reed College and his Ph.D. in History of Science at the University of California, Berkeley, where he participated in the project "Sources for History of Quantum Physics." His dissertation on "The Environment and Practice of Atomic Physics in Weimar Germany" came out of, and resulted in, a number of special investigations aiming to fuse conceptual and social descriptions and explanations of scientific work. After teaching for 5 years at the University of Rochester and spending a year doing research at the University of California in Berkeley, he moved to the Smithsonian where he has been for the past 10 years. He has collected artifacts and prepared exhibits on particle accelerators, atomic clocks, Einstein, and parity. His current work is directed toward a book on the history of atomic clocks.

Renewal Time!

If your address label is marked with a red star, this is the last issue you will receive unless you renew your subscription (see inside back cover).

Wise is Associate Professor of History at the University of California, Los Angeles, where he teaches history of physics and physical science. Wise began his career as a nuclear physicist with a Ph.D. from Washington State University. After teaching at Auburn University and Oregon State University and working on low-energy nuclear reactions for 4 years, he turned to history of science and took a second Ph.D. in that subject at Princeton. His research has focused on British electrodynamics and dynamical theory in the 19th century, German concepts of force and energy in the same period, and on changes in interpretation of probability from deterministic to indeterministic around the turn of the century. At present he is co-authoring a scientific biography of Lord Kelvin, and is involved in a project involving the significance of new experimental instruments and techniques for the emergence of a new style of research in physical sciences in mid-19th century Germany.

The other officers of the Division are: Arthur I. Miller, Chairperson; Stephen G. Brush, Secretary-Treasurer; Laurie M. Brown, Past Chairperson; Max Dresden, Divisional Councillor. The Executive Committee includes all of the above and Allan Franklin, Gloria Lubkin, Roger Stuewer, and Robert R. Wilson. Spencer Weart, as Director of the Center for History of Physics, is an ~~executive~~ member.



Call for Nominations for 1985 Officers

The Nominating Committee for next year's election consists of Allan Franklin (chair), Paul A. Hanle, K. C. Wali, and Linda Wessels. Nominations for Vice-Chairperson (to become Chairperson in the following year) and for two persons to serve 3-year terms on the Executive Committee should be sent by October 31 to Prof. Allan Franklin, Physics Dept., Campus Box 390, University of Colorado, Boulder, CO 80309. A list of Division members, eligible for nomination, is in the 1983 APS Membership Directory, pp. 1725-28.



Executive Committee Meeting

The Executive Committee of the Division held its annual meeting on 24 April 1984 in Washington, DC.

The first item of business was the report of an *ad hoc* committee on a proposed book prize (see below). After some discussion, the Executive Committee voted to approve the establishment of the prize, subject to approval of appropriate APS committees. It was decided that the prize need not be awarded every year if the prize committee decided that no books of sufficiently high quality had been nominated; however, books copyrighted during the preceding 3-year period would be eligible.

Funding for the prize will be sought from various corporate and individual donors. Readers of HPN who can suggest likely donors (including themselves) are urged to notify the Secretary-Treasurer of the Division, Stephen Brush.

The History of Physics Newsletter (HPN) is published by the Division of History of Physics of the American Physical Society. It is distributed free to all members of the Division. Others may subscribe at \$10 per volume (\$5 additional for air mail); see inside back cover. Each volume consists of 5 issues; we expect to publish two issues per year.

Editor: **Stephen G. Brush**, Department of History and Institute for Physical Science & Technology, University of Maryland, College Park, MD 20742 (301/454-2724). (Mailing address from 10 September to 1 December will be: Institute of Geophysics & Planetary Physics, Geology Bldg. room 3684, University of California, Los Angeles, CA 90024; phone 213/825-1580.) Associate Editors: **Gloria B. Lubkin**, Physics Today, American Institute of Physics, 335 East 45 Street, New York, NY 10017, and **Kathryn Olesko**, Georgetown University (on leave 1984-85). Editorial assistants: **James Beichler** and **Martin Collins**, University of Maryland.

Executive Committee Meeting (continued)

Laurie Brown, for the Committee on Publications, reported on a proposal for participation by AIP in publication of the book series, "History of Modern Physics 1800-1950," currently being published by Tomash Publishers (see HPN, vol. 1, pp. 5, 103; for the announcement of the AIP book publishing project related to this proposal see Physics Today, July 1984, p. 61). Other proposed book series of this kind were mentioned. The Executive Committee wants to encourage such projects without giving exclusive approval to any one commercial venture. No action was taken because detailed information was yet not available. The Committee on Publications consists of **Roger Stuewer** (Chair), **Laurie Brown**, and **Stephen Brush**.

Allan Franklin discussed a proposal to obtain review articles on the history of physics for publication in the American Journal of Physics. There seems to be some difficulty in persuading qualified authors to write such reviews. It was suggested that readers of HPN be encouraged to consider AJP as an appropriate place to send historical articles in order to reach a large number of physics teachers and other physicists interested in the historical and cultural aspects of physics; authors are reminded that there is no longer a publication charge. Further information may be obtained from the editor of AJP, **John Rigden**, Room 240 Benton Hall, University of Missouri, St. Louis, MO 63121.

Max Dresden (the Division's representative to the APS Council) reported that the Council wants to encourage historical symposia. There were several complaints about the schedule conflict this year which put the Division's session on Einstein in competition with another general interest session.

The APS Council has requested that the Division prepare criteria for election of its members to be APS Fellows. It was agreed that the Chairperson of the Division should appoint a Committee on Fellowships (see below).

The Division's sponsorship of regional history of physics meetings such as the Joint Atlantic Seminar (see HPN, vol. 1, p. 90, and p. 3 of this issue) was discussed. Similar groups in other parts of the country might deserve support. It was decided that the Division should continue its support for JAS, but that in two years the general issue should be discussed again by the Executive Committee; in the meantime an ad hoc committee will look study the question. The committee consists of **Kathryn Olesko** (chair), **Robert E. Schofield**, and **M. Norton Wise**.

Stephen Brush reported an inquiry from **Eugene Garfield** (Institute for Scientific Information) about possible Division co-sponsorship or endorsement of a proposed Physics Citation Index for the period 1930-54. The Executive Committee expressed its interest in this project but would like more information before taking any definite action.

A proposal from **Fritz Rohrlich** (Syracuse University) to include the philosophy of physics within the scope of Division activities was discussed. The proposal was presented by Rohrlich at the annual Business Meeting. It was noted that the preamble to the Division's By-Laws states: "The object of this Division shall be encouragement of scholarly research in the history of physics and the diffusion of knowledge of this history and its relation to other scholarly disciplines." The sense of the Executive Committee was that this language means that philosophy of physics is within the scope of the Division, if such investigations are directly related to the history of physics. Thus the Division may sponsor symposia in the philosophy of physics that have a strong historical component if there is sufficient interest in this topic.

Rohrlich will try to attract additional members to the Division who would join as a result of this encouragement to those interested in the epistemology and ontology of physics and related philosophical questions. Readers of HPN who would like the Division to organize sessions on the philosophy of physics in the near future are invited to contact Prof. Fritz Rohrlich, Department of Physics, Syracuse University, Syracuse, NY 13210; please send a copy of your letter to S. G. Brush, IPST, University of Maryland, College Park, MD 2072 for the Division records.

Program Committee

The Program Committee for 1984-85 will consist of **Arthur I. Miller** (chair), **Max Dresden**, **John Rigden**, **Roger Stuewer**, and **John A. Wheeler**. Suggestions for programs should be sent to Miller at the Department of Physics, Harvard University, Cambridge, MA 02138 (phone 617/495-4475).

Fellowship Committee

According to the APS Constitution (Article III, Section 3), "There shall be elected to Fellowship only such Members who have contributed to the advancement of physics by independent, original research, or who have rendered some other special service to the cause of the sciences. The fulfillment of these qualifications shall normally be determined by an examination of the published works of the candidate." As noted above, the APS Council has asked the Division of History of Physics to suggest more specific criteria for selecting Fellows from the Division.

The APS Bylaws (Article VIII) state that each Division and Forum shall establish annually a Fellowship Committee to review qualifications of candidates for Fellowship and report its recommendations to the Division or Forum for submission to the Fellowship Committee of the Society. The latter committee recommends a list of nominees each year, not to exceed 1/2 of 1% of the current APS membership. On this basis the Division of History of Physics might nominate as many as 7 new Fellows each year.

The Fellowship Committee of the Division of History of Physics consists of **Stephen G. Brush** (chair), **William A. Fowler**, and **Martin J. Klein**. Suggestions for nominations to Fellowship should be sent to Stephen Brush (address above). The Committee will present its recommendations for criteria and its nominations for Fellowship to the Executive Committee in April 1985.

Book Prize

In 1983 a committee consisting of **Stephen Brush** (chair), **Gerald Holton**, and **Robert Schofield** was appointed to prepare a proposal for a Book Prize in the History of Physics to be awarded by the Division. The proposal summarized below was approved, with minor changes, by the Executive at its annual meeting in April 1984.

The Prize would be awarded each year for an outstanding book on the history of physics, in English, copyrighted in the previous 3 years. The author need not be a member of the Division, and may be of any nationality; English translations of books originally published in other languages are eligible.

The amount of the prize would depend on available funding but should be at least \$1500 plus expenses for travel to receive the award at an APS meeting. (APS "suggested boundary conditions" state that the amount should be at least \$5000, and that enough money must be available initially to award the prize 5 times.) Money for the prize would not come from current Division funds but would have to be raised separately from individual and/or corporate donors.

Biographies are eligible but autobiographies are not, nor are bibliographies, museum guides, and compilations of data. Preference should be given to unified historical monographs by one or two authors. Books based on previously-published articles are eligible but should have been revised into an integrated, updated treatment of a single subject. Books should provide full documentation according to the standards of the historical profession, and should be technically accurate and complete. Textbooks, popularizations, and fictionalized treatments will ordinarily not be considered. But a book which concentrates on a narrow topic should not be favored over one of broad scope, and the committee may take into account such factors as literary style and readability. Books devoted entirely or primarily to the history of physics should be given preference but longer works with substantial portions devoted to history of physics may be considered. Annotated editions or translations of original sources are eligible but should be favorably considered only when there is a significant new contribution to the history of physics in the form of notes and commentary.

The prize committee should consist of 3 members, to be appointed by the Chairperson of the Division with advice from the Executive Committee. In addition to the publication of general announcements about the prize in HPN and elsewhere, the committee may identify eligible books and solicit nominations from their publishers. Publishers would be asked to send a review copy of each book nominated to each member of the committee. In addition to the book chosen for the prize, as many as 3 other books may be recommended for reconsideration by the next year's committee; other books which failed to win the prize in their year of publication but are still eligible may be renominated, not necessarily by the committee. The committee may award "Honorable Mention" to one, two, or three outstanding books which did not win the prize but are in their last year of eligibility. As noted above, the Executive Committee voted that the prize committee does not have to award any prize if it decided that no books of sufficiently high quality have been nominated that year.

Final approval for the establishment of the prize must still be given by the APS Committee on Prizes.

Division Membership

According to the APS Bulletin, 1984, 29: 875, the membership of the Division of History of Physics increased from 1163 to 1485 between 30 June 1982 and 30 June 1983; the increase of 322 was the second largest of any Division. By 30 June 1984 the Division had grown to 1669 members. History of Physics is now the 8th largest of the 12 APS divisions.

Joint Atlantic Seminar

The 1984 meeting of the Joint Atlantic Seminar in the History of the Physical Sciences was held at Cornell University, Ithaca, New York, 27-28 April; it was co-sponsored by the Division of History of Physics. The meeting opened on Friday evening, April 27, with a panel discussion on "New Trends and Old Traditions in the Historiography of Science." Participants were **Lewis Pyenson** (Montreal), "What is Social History of Science?"; **L. Pearce Williams** (Cornell), "Science: 'Wie es eigentlich gewesen'"; **Martin Harwit** (Cornell), "Modern Science and Modern Scientists." The moderator was **Kathryn Olesko** (Georgetown).

The following papers were presented on Saturday, April 28: "Augustus de Morgan, Whig History and the Foundations of Algebra" -- **Joan Richards** (Brown); "Civic Chemistry in Metropolitan New York, 1870-1910: The Chandler Circle" -- **Jeffrey L. Sturchio** (New Jersey Institute of Technology); "The Role of the Scientific Entrepreneur and of Public Patronage in the Development of Nuclear Physics at McGill University, 1935-1950" -- **Jerry Thomas** (Toronto); "Robert Hooke and the Analysis of Motion due to Central Forces" -- **Patri J. Pugliese** (Boston University); "Francis Bacon's Logic of Discovery" -- **Christopher Burch** (SUNY Oswego); "G. Taylor's Statistical Theory of Turbulence" -- **Giovanni Battimelli** (Rome); "Max Abraham in Italy" -- **Michelangelo De Maria** (Rome).

The meeting concluded with a reception and visit to the History of Science Collections at the Olin Library of Cornell University.

JOBS

Einstein Papers

The Einstein Papers Project is preparing a complete edition of Einstein's published and unpublished writings and correspondence to be published by Princeton University Press. The Project is seeking a full-time Assistant Editor to begin as soon as possible. Duties will include transcription, annotation and archival research. The candidate must possess an excellent reading knowledge of German and post-doctoral experience in one or more of the following fields: history of 20th-century physics, philosophy of physics, physics (background in statistical physics, relativity or quantum theory preferred). Experience with word processors desirable. Salary negotiable. Princeton University Press is an equal opportunity employer. Submit letter of application and curriculum vitae to John Stachel, Einstein Project, Boston University, Boston, MA 02215.

Maryland

The Committee on the History and Philosophy of Science, University of Maryland, invites applications for a senior position in the philosophy of science. Preference will be given to candidates who also have competence in the history of science. Contact **Lindley Darden**, Department of Philosophy, University of Maryland, College Park, MD 20742 (301/454-2850).

Pittsburgh

The Department of History and Philosophy of Science, University of Pittsburgh, announces a position at Assistant Professor rank, tenure track; salary \$18,000 to \$20,500, depending on experience and qualifications. Successful applicant must have Ph.D. in History and Philosophy of Science, distinguished publications in recognized academic journals, be able to teach philosophy of science, post-Renaissance history of science, and history of modern physics to undergraduate and graduate students, including thesis advising, and show promise of distinguished research in history of science and philosophy of science. Send dossiers to **Peter K. Machamer**, University of Pittsburgh, Department of History and Philosophy of Science, 1017 Cathedral of Learning, Pittsburgh, PA 15260, by 30 September 1984.

Another position at Pittsburgh will be available for a person in history and philosophy of science, preferably specializing in medieval, psychology, technology or scientific method; rank and salary open. Send dossiers to **Peter K. Machamer** (above) by December 1.

GUEST EDITORIAL

History of Physics and the Physics Curriculum

by Arthur I. Miller

The Division of History of Physics (DHP) is the second fastest growing division of the APS. During the period 30 June 1982 to 30 June 1983 membership increased by 322 to 1,485, and continues to grow.

The DHP's goal is to promote interest in the history of physics for three principal reasons:

(1) History of physics is as professionalized a discipline as physics itself, and so it is meaningful to ask, "What's new in the history of physics?"

(2) History of physics belongs in an undergraduate physics curriculum.

(3) Knowledge of the history of physics can make one a better physics teacher.

Over the last decade or so the history of physics has shed its old image as merely a catalogue of old and now useless theories or a forum for rehearsing heroic tales that are mostly apocryphal anyway. Rather, the history of physics has become part of the history of ideas. The historian of physics is a scholar who knows not only the hard-core physics, but also the philosophical currents of the time and the culture in which the research in question was accomplished. All of this is required in order to begin to understand a theory's incubation, invention and reception. All of this is required to begin to probe larger problems such as the construction of scientific concepts, scientific thinking and progress in science. For example, the historian of physics studies the foundational analyses of mechanics and electromagnetism made by Maxwell, Poincaré, Lorentz and Einstein. Then there are the step by step investigations into the nature of matter by Bohr and Heisenberg. Through a course in the history of physics students can learn these aspects of physics because they cannot be covered in physics courses, owing to lack of time and to the instructor's lack of historical expertise. Students delight in studying these subjects directly from primary sources (increasing numbers of primary sources are becoming available in English). Courses entitled "The History of Quantum Mechanics," "The History of Relativity Theory," "History of Theories of Space and Time," or "Classics in Physics" can attract substantial enrollments. Personal experience has shown this to be the case. And, indeed, what better compliment is there than when students of physics say to you at the end of the term that your course opened their eyes to new aspects of physics. In these days of increased awareness of what science can or cannot accomplish, the physics department does well to have the help of a historian of physics.

I hope it is clear by now that knowledge of history of physics can make one a better physics teacher -- or, at least, a more interesting teacher. Amid the "calculate now and understand later"

can make one a better physics teacher -- or, at least, a more interesting teacher. Amid the "calculate now and understand later" syndrome that to some degree permeates many physics courses, discussion concerning points historical, e.g., biographical or foundational, can spark a students interest to inquire beyond the subject matter at hand.

As Colin Russell put it recently in *Nature* (vol. 308, p. 778): "Science without its history is like a man without a memory."

[Arthur I. Miller is Chairperson of the Division of History of Physics]

CONFERENCES

Faraday

A symposium "Faraday Rediscovered" will be held at the Royal Institution, London, 19-21 September 1984. The following papers will be given: **George Porter**, "Introduction"; **David Knight**, "Davy and Faraday: Fathers and Sons"; **Geoffrey Cantor**, "The Sandemanian Church and Faraday's Science"; **Sophie Forgan**, "From servant to sage: The institutional context"; **Ronald King**, "Demonstration Lecture: Faraday's critical experiments in the discovery of electromagnetic induction"; **Brian Bowers**, "Faraday, Wheatstone and Electrical Engineering"; **J. O. Marsh**, "Sturgeon and the discovery of electromagnetic induction"; **L. Pearce Williams**, "Faraday and Ampère: A contrast in theory verification"; **David**

Gooding, "'In Nature's School': Faraday as an experimentalist"; **George Porter**, "Faraday as a chemist"; **Ryan Tweney**, "How did Faraday discover induction?"; **Elspeth Crawford**, "Learning from Experience"; **Gertrude M. Prescott**, "Faraday: The image of the man and the portrait collection"; **Frank Greenaway**, "Conclusion." For information contact Frank James, Royal Institution, 21 Albemarle Street, London W1X 4BS, England, UK.

SHOT

The 1984 annual meeting of the Society for the History of Technology will be held in Cambridge, MA, 1-4 November 1984. For information contact Gayle Fitzgerald, Campus Information Services, Room 7-111, Massachusetts Institute of Technology, Cambridge, MA 02139.

4S

The annual meeting of the Social for Social Studies of Science (4S) will be held 14-17 November 1984 in Ghent, Belgium. For information contact Susan E. Cozzens, Room 1229, National Science Foundation, Washington, DC 20550 (phone 202/357-7826).

History of Science Society

The annual meeting of the History of Science Society will be held in Chicago at the Palmer House, 27-30 December 1984. The preliminary program includes three sessions entirely on history of physics & astronomy:

History of Solid-State Physics - **Lillian Hoddeson** (Illinois), "Review of International Project on the History of Solid-State Physics"; **Gordon Baym** (Illinois), "Heisenberg, Pauli, and the Emergence of the Quantum Theory of Solids, 1926-1933"; **Paul Henriksen** (Illinois), "Semiconductor Research at Purdue University, 1943-1945: Scientific Advance in the Context of War"; **Krzysztof Szymorski** (Illinois), "World War II and American Solid State Physics"; **Spencer Weart** (AIP), "The Solid Community: 1930-1960."

Mathematical Physics and Natural Philosophy at 14th-Century Oxford - **Andre Goddu** (Notre Dame), "Ockham's argument for action at a distance"; **Stephen J. Livesey** (Oklahoma), "Thomas Bradwardine and the Legitimacy of the Quantification of Motion"; **Edith Sylla** (North Carolina State), "The Oxford Calculators and Mathematical Physics: John Dumbleton's *Summa Logicae et Philosophiae Naturalis*, Books II and III"; **Edward Grant** (Indiana), comment.

The Shift to Large National Research Facilities - **Alan Needell** (Smithsonian), "AUI, NSF and Radio Astronomy: A case study of management in the transition to very big national research facilities"; **Lillian Hoddeson** (Illinois), "Fermilab and the first superconducting magnet accelerator: Technological innovation in the large laboratory context"; **Leon Lederman** (Fermilab), "The

evolution of super-laboratories: growth, centralization and the large laboratory phenomenon"; **Robert Seidel** (Berkeley), "Comments and comparisons with Lawrence-Livermore, Lawrence-Berkeley and Los Alamos Scientific Laboratory."

Other papers related to history of physics are:

Paul Theerman (Smithsonian), "The physical sciences at the University of Chicago, 1892-1940"; **Albert E. Moyer** (Virginia Tech), "The tension between democratic and elitist values in American physics"; **Lewis Pyenson** (Universite de Montreal), "Styles of diffusion in exact sciences: French and German researchers in Latin America, 1840-1940"; **Jack Holl** (U. S. Dept. of Energy), "Atoms for Peace and War: The U. S. Atomic Energy Commission in the Eisenhower Administration"; **Anita Guerrini** (American Philosophical Society), "The Tory Newtonians: Gregory, Pitcairne, and their Circle, 1690-1715"; **David E. Channell** (Texas/Dallas), "W. J. M. Rankine and the concept of stream-lines"; **Robert W. Seidel** (Berkeley), "How they saw the Old World: In European Laboratories in the 1920s."

There will also be three sessions on the history of technology jointly sponsored by the American Historical Association and the Society for History of Technology.

For details of the program see the HSS Newsletter, July 1984. Information about this meeting and about the History of Science Society can be obtained from the Secretary, Dr. Audrey B. Davis, National Museum of American History, Room 5000, Smithsonian Institution, Washington, DC 20560.

Midwest Junto

The annual Midwest Junto meeting will be held 18-20 April 1985 at the University of Minnesota, Minneapolis. For information contact William Aspray, Charles Babbage Institute, Walter Library, University of Minnesota, Minneapolis, MN 55455 (phone 612/376-9336).

International History of Science Congress

The XVIIth International Congress of the History of Science will be held from 31 July through 8 August, 1985, in Berkeley, California. The general theme is "Cross-Cultural Perspectives on Scientific Advance." Detailed information can be obtained by writing to International Congress of History of Science, Office for History of Science and Technology, University of California, Berkeley, CA 94720. The second circular will be mailed in September 1984 to persons requesting it; deadline for receipt of registration fees at special reduced rate is 28 February 1985; deadline for receipt of abstracts is 31 March 1985.

Experiment

A conference on experimentation in the natural sciences, from historical, sociological, and philosophical perspectives, will be held at Newton Park, near Bath, England, 30 August-2 September 1985. For information contact D. C. Gooding, School of Humanities and Social Sciences, University of Bath, Bath BA2 7AY, England, UK.

PERSONALIA

Cohen

I. Bernard Cohen retired in June 1984. He was Victor S. Thomas Professor of the History of Science at Harvard. Cohen is the author of numerous books and articles on Isaac Newton and related topics in the history of physics.

England

J. Merton England (NSF) was awarded a prize at the annual meeting of the Organization of American Historians for the best historical book on the federal government by a historian connected with the government: A Patron for Pure Science: The National Science Foundation's Formative Years, 1945-57 (1983).

Friedel

Robert Friedel has been appointed Associate Professor of History at the University of Maryland, College Park. He will be a member of the Committee on the History and Philosophy of Science, and will teach courses in the history of technology. Formerly Director of the Center for the History of Electrical Engineering, Friedel is the author of Pioneer Plastic: The Making and Selling of Celluloid (1983) and is currently doing research on the history of the transistor.

Gillmor

C. Stewart Gillmor (Wesleyan University) has been awarded a U.S.-France Exchange Program Award (NSF-CNRS) for research in Paris on the history of physics. From July, 1984 through August, 1985 he will be at the Centre de Recherches en Physique de l'Environnement Terrestre et Planetaire, 4 Avenue de Neptune, 94100, St-Maur-des-Fosses, France. He will continue as editor of EOS for articles on the history of geophysics.

Miller

Roberta Balstad Miller became the Director of the Division of Social and Economic Science at the National Science Foundation on June 18. Among the programs included in the Division is the History and Philosophy of Science Program. Prior to assuming her new position at NSF, she was the Executive Director of the Consortium of Social Science Associations, and had taught at Catholic University, the University of Minnesota, Oberlin College, and Hiram College. Dr. Miller was a regular participant in Connections, a PBS television series on the history of technology. She is the author of City and Hinterland: A Case Study of Urban Growth and Regional Development (1979), co-editor of Science Indicators: Implications for Research and Policy (1980) and co-editor of Health and Human Behavior (1983); she has published several articles on the social sciences.

Porter

Theodore M. Porter has been appointed Assistant Professor of History at the University of Virginia, Charlottesville. His Ph. D. dissertation was on statistical thinking in the social and natural sciences of the 19th century (Princeton, 1981) and he published an article on Maxwell's gas theory in Historical Studies in the Physical Sciences (1981).

Veltman

Kim Henry Veltman, a student of Renaissance optics and perspective, has been appointed Assistant Professor at the Institute for the History and Philosophy of Science and Technology at the University of Toronto.

Vucinich

Alexander Vucinich was awarded the Zeitlin-Ver Brugge Prize for the outstanding article in Isis for the years 1980-1982, at the annual meeting of the History of Science Society in October 1983 at Norwalk, CT. The article, "Soviet Physicists and Philosophers in the 1930s: Dynamics of a Conflict," was published in June 1980. (See Isis, 1984, 75: 356)

GRANTS AND FELLOWSHIPS

Note: See the History of Science Society *Newsletter*, July 1984, pp. 3-6, for information about several other grants and fellowships; also, previous issues of HPN, vol. I, pp. 7-8, 28, 69-71.

Austrian History

The Austrian Ministry for Science and Research offers scholarships to U. S. graduate students for the academic year 1985-86 for research and study in Austrian history. Deadline for receipt of complete application is 15 November 1984. Contact Prof. William E. Wright, Director, Center for Austrian Studies, University of Minnesota, Minneapolis MN 55455.

Babbage Institute

The Charles Babbage Institute for the History of Information Processing offers a predoctoral fellowship (stipend \$5000 + up to \$2500 for tuition and expenses) and a professional internship (3 to 9 months, stipend \$1000/month) for 1985-86. Applications must be received by 15 January 1985. Contact CBI, University of Minnesota, 104 Walter Library, 117 Pleasant Street S. E., Minneapolis, MN 55455.

Dudley Observatory

The Herbert C. Pollock Award is offered to support an innovative research project in the history of astronomy or astrophysics to be undertaken by a staff member or a post-doctoral student associated with a college, university or observatory located in the United States. The award consists of \$6000 to be paid during the academic year in which work will be in progress. Special consideration will be given to proposals that involve the 15th-18th century rare books of the Dudley Observatory -- now housed in the Schaffer Library of Union College -- or Dudley's collection of source material in 19th century astronomy. Applications that do not lead to granting of the Pollock Award will be considered for lesser Dudley Awards. Deadline for applications is 1 January 1985. For information contact: Pollock Award Committee, Dudley Observatory, 69 Union Avenue, Schenectady, New York 12308.

NEH

In the last issue of HPN we presented some advice about NEH grant proposals, taken from *AHA Perspectives*. Another article, too long to quote here but worth reading for anyone who is planning to apply to NEH, is "The Art of the Fellowship Proposal" by John Lippincott. It appeared in *AHA Perspectives*, Sept. 1982, vol. 20, no. 6: 26-29. Readers who want to obtain this and other publications of AHA should write to: American Historical Association, 400 A Street SE, Washington, DC 20003 or call 202/544-2422.

NSF - EVIST

The NSF Ethics and Values in Science and Technology Program supports research and related activities to help answer the question: how can the ethical problems and value conflicts associated with current scientific, engineering and technical activities be better understood and more effectively resolved, by scientists and engineers, scholars in the humanities, persons making science policy, and members of affected groups? Projects focus on the activities of scientists (including social scientists) and engineers in areas of social or professional concern. They are intended to clarify the ethical implications or value assumptions of those activities and to contribute to improved policies and practices affecting and affected by them.

EVIST makes awards for research, individual professional development, and dissertation support. The next closing date for submitting preliminary proposals is 1 November 1984. Contact Rachelle Hollander, EVIST, NSF, Washington, DC 20550 (phone 202/357-7552).

NSF - HPS

The NSF History and Philosophy of Science Program announces revisions in the special classes of awards established in 1981 (see HPN, vol. 1, p. 7): the "Summer Scholars Award" for partial support of full time summer research has been increased to a maximum of \$9000, and the "NSF Scholars Award" for partial support of one or more semesters of research has been increased to \$30,000. Proposals may be submitted at any time; awards will be announced about 6 months after the target date (September 1 or February 1). At least 60% of the Program's available funds will be reserved for these awards.

Projects involving the preparation of reference works, research tools, scholarly editions of scientists' papers, archives, etc. or which require more funding from NSF than provided by the Scholars Award will be considered; they should be discussed in advance with NSF staff. Up to 40% of available funds may be used to support projects in this category.

Information about awards and about the HPS program may be obtained from Dr. Ronald Overmann, Program Director, History and Philosophy of Science Program, National Science Foundation, 1800 G St. NW, Washington, DC 20550 (phone 202/357-9677).

Smithsonian

The Smithsonian Institution offers research fellowships for 1985-1986 in the History of Science and Technology, to support independent research in residence at the Smithsonian related to research interests of the Institution's professional staff and using the Institution's collections, facilities, and laboratories. Pre- and postdoctoral fellowship appointments for 6 to 12 months and graduate student appointments for 10 weeks are awarded. Stipends are \$18,000 per year plus allowances for postdoctoral fellows; \$11,000 per year plus allowances for predoctoral fellows; and \$2000 for graduate students for the 10-week period. For information write to Office of Fellowships and Grants, Desk J, 3300 L'Enfant Plaza, Smithsonian Institution, Washington, DC 20560, indicating the particular area in which you propose to conduct research, and give the dates of degrees received or expected. Applications are due 15 January 1985.

QUERIES

Vienna Physicists

"I am currently writing a history of the University of Vienna during the years 1918-1938 and would very much like to know whether any work is being done on the physics faculty of that institution in this period. Of special interest are Stefan Meyer, Ehrenhaft, Schweidler, and Hans Thirring. The names of scholars working in this or related fields would be appreciated."

---John Haag, Department of History, University of Georgia, Athens, GA 30602.

Humor

"For possible inclusion in an anthology, *Science with a Smile*, I should welcome contributions of humor in the sciences: physics, chemistry, astronomy, mathematics, earth sciences, life sciences (including medicine) and computer science -- historic and contemporary. Appropriate would be anecdotes, biographical notes, parodies, cartoons, verse, examples of self-deception and hoaxes. I especially seek those items that while humorous also have value in the history of science, providing insight into changing attitudes or illuminating personalities. Please identify fully the source of all contributions."

---Robert L. Weber, 104 Davey Laboratory, University Park, PA 16802

REPORTS

Victorian Mathematical Physics

A BSHS conference on "Cambridge Mathematical Physics in the 19th Century" was held at Grasmere, UK, 23-26 March 1984. A extensive report by David Gooding may be found in the Newsletter of the British Society for the History of Science, May 1984, no. 14: 10-13. In addition to the papers listed in HPN, vol. 1, p. 100, Harvey Siegel spoke on Maxwell's vortex model. The proceedings will be published by Manchester University Press, edited by Peter Harman who organized the conference.

Women in Physics

At the Summer Meeting of the American Association of Physics Teachers, held at College Park, MD, 25-29 June 1984, the Committee on Women in Physics sponsored its second symposium on "Women's Roles in Physics: A Historical Perspective." The following papers were presented:

"Women in Physical Science: From Drudges to Discoverers" - Stephen G. Brush, University of Maryland, College Park

"Maria Goeppert Mayer and the Shell Model of the Nucleus" - Karen Johnson Fleckenstein, University of Minnesota, Minneapolis

"Maria Mitchell, Pioneer Woman Astronomer" - Dorrit Hoffleit, Yale University

The proceedings of the first symposium, held in 1983, have been published in a volume edited by Barbara Lotze, Making Contributions: An Historical Overview of Women's Role in Physics (AAPT, Department of Physics & Astronomy, University of Maryland, College Park, MD, 1984).

Cherwell papers

The Contemporary Scientific Archives Center (Oxford, England) announces that papers of Frederick Alexander Lindemann, Viscount Cherwell of Oxford, have been catalogued. CSAC Catalogue no. 99/3/84, 6 pp., has been deposited in the Library of Nuffield College, Oxford. This is a supplementary catalogue of material additional to the main catalogue of the Cherwell papers CSAC no. 80/4/81. It consists of early autograph manuscript notes and drafts on specific heat, early quantum theory and the movement of electrons in atoms. Much of the work is in German and dates from the years which Cherwell spent in Nernst's laboratory, c. 1910-14. (For information about CSAS write to them at 16 Wellington Square, Oxford OX1 2HY, England, UK.)

Mendelssohn papers

The Contemporary Scientific Archives Centre (see above) announces that their catalogue CSAC no. 93/4/83, 118 pp. for the collection of the physicist Kurt Alfred Georg Mendelssohn (1906-1980), has been deposited at the Bodleian Library, Oxford.

Chemical Atomic Theory

A symposium on John Dalton and the history of chemical atomic theory was held at the Philadelphia meeting of the American Chemical Society, 28 & 29 August 1984. Speakers were Theron Cole, Seymour Mauskopf (Duke), Evan Melhado (Illinois), Mary Jo Nye (Oklahoma), Alan Rocke (Case Western Reserve) and Arnold Thackray (Pennsylvania). For information about this and other historical symposia at ACS meetings, contact Jeffrey L. Sturchio, Center for History of Chemistry, E. F. Smith Hall D6, University of Pennsylvania, 215 South 34th Street, Philadelphia, PA 19104 (phone 215/898-4896).

Trial of Galileo

The Vatican announced on 2 July 1984 that it will publish secret records of the trial of Galileo Galilei, who was charged with heresy for claiming that the Earth revolved around the sun. Vatican sources said the decision appears to reflect Pope John Paul II's stated belief that an Inquisition court in 1633 may have erred in condemning Galileo. Partial records of the heresy trial have been published in the past but other transcripts have been kept in a secret archive of the Vatican and never released. (UPI dispatch, published in New York Times, 3 July 1984, p. C4; see longer report, 17 July, p. C3.)

A New Mechanism?

A colloquium on "Dynamical Systems: A Renewal of Mechanism" was held from 28 August to 6 September 1984 at Peyresq village (Alpes-de-Haute-Provence), to celebrate the centennial of George David Birkhoff (1884-1944) and the bicentennial of the deaths of Jean d'Alembert (1717-1783), Daniel Bernoulli (1700-1782) and Leonhard Euler (1707-1783). According to the announcement, the aim of the conference was "to try to recognize the main conceptual trends which have emerged in the last decades in the study of dynamical systems. The 20th century appeared at first to mark the unequivocal triumph of microphysics and quantum mechanics. But the second half of the century would seem to be also dominated by an exploration of the unsuspected wealth of behaviour of dynamical systems. The very concept of a dynamical system is a generalization of the concept of mechanical system originating from the geometrization of mechanics due to H. Poincaré and G. D. Birkhoff, and from the study of the stability of motion and non linear vibrations due to A. M. Lyapounov and A. A. Andronov. The discovery of chaotic phenomena has already bridged the traditional gap between determinism and chance, and the variety of situations revealed by the study of non linear systems has opened many new perspectives in physics, including quantum mechanics. A renovated Mechanism is appearing and the consequence of this, is the progressive emergence of a new vision of the world."

Further information may be obtained from the colloquium's sponsor, Fondation Louis de Broglie, 1, rue Montgolfier, F-75003 Paris, France.

History for British Physicists

The Institute of Physics (London) held a preliminary meeting several months ago to discuss the possibility of setting up a group or section on the history of physics. We expect to have a report in the next issue of HPN.

Boston Colloquium

The program of the Boston Colloquium for the Philosophy of Science, 1983-84, included the following sessions:

"Einstein on locality and separability" - Don Howard (Kentucky); commentator, Jon P. Jarrett (Vermont)

"From Quarks to the Big Bang: The Synthesis of the 1970s" - Sheldon Glashow (BU & Harvard), commentator Kenneth Brecher (BU)

"The Physicist's Toolbox" - Martin Krieger (MIT), commentator S.S. Schweber (Brandeis)

"Do electrons exist?" - Asher Peres (Haifa), commentator John Stachel (BU & Einstein Project)

"The Principle of Equivalence: Einstein's Way Out" - John Norton (BU & Pittsburgh), commentator John Graves (BU)

For information about the Colloquium contact Katie Platt, Philosophy Department, Boston University, Boston, MA 02215 (phone 617/353-2604).

REPORTS (continued)

Quantum Physics Archive in London

The Science Museum Library (London) has become the 8th depository for the microfilm Archive for History of Quantum Physics, assembled by a group led by Thomas S. Kuhn in the 1960s, sponsored by the American Physical Society and the American Philosophical Society. Other repositories are in Philadelphia, New York, Berkeley, Minneapolis, Copenhagen, Rome, and Munich.

Mathematics

The British Society for the History of Mathematics held an afternoon meeting at the Science Museum, London, on 22 June 1984. Speakers included R. A. Rankin on "Ramanujan" and D. T. Whiteside on "1684 and the birth of classical mechanics." For further information contact D. J. Wright, Department of Pure Mathematics, UCNW, Bangor, Gwynedd LL57 2UW, Wales UK.

19th Century Science

A BSHS meeting on "New Perspectives in Nineteenth Century Science" was held at Eliot College, University of Kent at Canterbury, 12-14 April 1984. Speakers included Norton Wise on Helmholtz and the establishment of the Berlin Physikalische Gesellschaft, Geoffrey Cantor on the supposed "simultaneous discovery" of the first law of thermodynamics, David Gooding on the relation between electrical science and technology, David Cahan on the establishment of physics laboratories in Germany, and John Burnett, John David, Mari Williams and Robert Smith on astronomy. A complete account by J. O. Marsh is in the BSHS *Newsletter*, May 1984, 14: 13-15.

BOOK SERIES

Science and Philosophy

Martinus Nijhoff Publishers announces a new series of books under the heading *Science and Philosophy*. This series will emphasize philosophical analyses of science based on examination of actual scientific practice, present or past, in the physical or biological sciences. Contributions from diverse philosophical traditions and philosophical analyses by historians of science, sociologists of science, and scientists are welcomed. Contact the series editor, Dr. Nancy J. Nersessian, c/o Martinus Nijhoff Publishers, Humanities and Social Sciences Division, Spuiboulevard 50, 331 GR Dordrecht, The Netherlands.

CERN History Study Reports

The following reports have recently been issued, according to information from HPN's foreign correspondent Lanfranco Belloni:

3. Dominique Pestre, *Prehistory of CERN: The first Suggestions (1949 - June 1950)* (March 1984), 60 pp.
4. John Krige, *Launching the European Laboratory Project: Britain's importance to it, and the obstacles to her participation in 1950* (March 1984), 18 pp.
5. Armin Hermann, *Die Rolle Deutschlands bei der Gründung von CERN*
6. John Krige, *Britain's physicists respond to the European laboratory project: January - June 1951* (April 1984), 20 pp.
7. Dominique Pestre, *Prehistoire du CERN: La fusion des initiatives juin 1950 - decembre 1950* (June 1984), 57 pp.
8. Lanfranco Belloni, *The Italian scenario* (June 1984), 36 pp.

To obtain copies of these reports write to Mrs. Rita French, Secretary, CERN History Study, c/o CERN, CH-1211 Genève 23, Suisse (Switzerland).

AUDIOVISUAL MATERIALS

Fission & Pulsar

The AIP Center for History of Physics has prepared an audio-visual package "Moments of Discovery." It contains 2 units: "The Discovery of Nuclear Fission" and "An Optical Pulsar Discovery." In the first the listener hears voices of Bohr, Rutherford, J. J. Thomson, Fermi, Einstein, Szilard and others woven into a half-hour narrated account, covering events leading up to the 1939 discovery and ending with the first self-sustained chain reaction in 1942. The second unit features a live recording inadvertently made of the conversation of John Cocke and Michael Disney as they were finding the first optical pulsar; this is said to be the only known tape recording of a discovery as it was taking place.

Each unit has an audio cassette, illustrated script, Teachers Guide and slides. The package may be ordered from Audiovisual 1, Center for History of Physics, American Institute of Physics, 335 East 45 Street, New York, NY 10017; enclose check for \$85 in U. S. dollars, payable to American Institute of Physics (\$2 billing charge otherwise). See also the CHP's *Newsletter*, May 1984.

Atom and Expanding Universe

Hawkhill Associates, Inc., in consultation with the History of Science Department at the University of Wisconsin, has published two new films, *The Atom* and *The Expanding Universe*, in its "Time, Space, & Spirit--12 Keys to Scientific Literacy" series.

The Atom, in two parts, tells the story of humankind's search for the ultimate unit of matter, beginning with the ancient Greek philosophers and ending in the strange new world of quarks, charmed quarks, and leptons (part one), and presents a clear, dramatic outline of present day concepts of the atom (part two).

The Expanding Universe, in two parts, traces the story of discoveries in astronomy through the ages (part one), and presents the modern day picture of where we are in the immensities of space (part two).

For information on prices and formats contact Hawkhill Associates, Inc., 125 E. Gilman St., Madison, WI 53703 (608/251-3934).

ANNOUNCEMENTS

Booksellers

We have received letters from three booksellers who would like to send their catalogues of books relating to history of physics to readers of HPN (see vol. 1, p. 92):

Science Book Service, 124 Windsor Court, St. Paul, MN 55112

The Old Number Six Book Depot, P. O. Box 525, Depot Hill Road, Henniker, NH 03242

The Sciences Bookshop, P. O. Box 148, Eltham 3095, Victoria, Australia.

JOURNALS AND SOCIETIES

(Supplement to the list given in HPN, March 1983, pp. 47-48, 53)

4S Review. Journal of the Society for Social Studies of Science

Sent to all members of the Society; membership dues are \$15 (professional), \$5 (students), \$25 (institutional, including libraries). Four issues each year, about 40 pages each. Send subscriptions and membership correspondence to Prof. Lowell Hargens, 4S, Department of Sociology, Indiana University, Bloomington, IN 47405. Manuscripts for publication should be sent to the Editor, Prof. Jerry Gaston, Department of Sociology, Texas A & M University, College Station, TX 77843.

[This journal is listed first because our library places titles beginning with numerals before those beginning with letters, and other libraries may follow the same practice -- S.G.B.]

American Journal of Physics

Robert Romen is now book review editor of the American Journal of Physics. He does not anticipate any significant policy changes, and wants to emphasize AJP's continuing interest in reviewing relevant books. Authors of books on the history of physics should urge their publishers to send review copies to Robert Romen, Book Review Editor AJP, Department of Physics, Amherst College, Amherst, MA 01002.

Archives internationales d'histoire des sciences

The American representative is Albert J. Phiebig Inc., Box 352, White Plains, NY 10602. Recent issues include several articles on topics in the history of physics such as Rankine on entropy, Larmor's electron theory, Euclid's Optics in the medieval curriculum, the kinetic theory of matter 1845-55, and the discovery of Hertzian waves.

Chinese Periodicals

Two Chinese periodicals (text in Chinese, titles in English) publish articles on the history of physics. Emphasis is on the history of Chinese science, but the history of science in the West is also covered.

Studies in the History of Natural Sciences (subscription information available from Chiao Liu Publications Service, P.O. Box 95734, Tsimshatsui Post Office, Hong Kong) began publication in 1982 and is issued four times a year. Recent articles on the history of physics discuss the work of Albert Einstein and Max von Laue, and the introduction of modern Western optics in China in the Ming-Qing period.

Journal of Dialectics of Nature (subscription information available from Guoji Shudian, Chegongzhuang Xilu 21, P.O. Box 339, Beijing, Peoples Republic of China), first published in 1979 and issued six times a year, contains articles on the philosophy and sociology of science, as well as on the history of science, and articles by contemporary scientists on their activities. Recent articles pertaining to the history of physics include: "The Discovery Process of Muon Atoms and Emergence of Strange Atom Physics," "Harbinger of the Coming Revolution of Physics--Mach's critique of classical mechanics in his book The Science of Mechanics," and "Geological Mechanics and the Historical Origin of the Early Theory of Continental Drift."

History and Technology. An International Journal

Editor: Pietro Redondi (CNRS, Paris). Manuscripts should be submitted to him c/o Harwood Academic Publishers, 58 rue Lhomond, 75005 Paris, France. Four issues per volume, starting September 1983. \$58 for libraries & institutions, \$29.50 for individuals; sample copy on request. Order from Harwood Academic Publishers, c/o STBS Ltd., 42 William IV Street, London WC2N 4DE, England.

Institut für Geschichte der Naturwissenschaften, Mathematik und Technik, Hamburg

The Institute publishes an Annual Report, titled Nachrichten. For information write to Christian Huenemoeder, Universitaet Hamburg, Institut fuer Geschichte der Naturwiss. [etc.], Bundesstr. 55 (Geomatikum), D-2000 Hamburg 13, Germany.

Osiris

Editor: Arnold Thackray, University of Pennsylvania, D6, 215 South 34th St., Philadelphia, PA 19104. The History of Science Society is reviving this journal, founded by George Sarton as a companion to Isis for longer articles. The first volume in the new series, to appear in 1985, will be on the theme "Historical Writing on Science in America."

Quipu. Revista Latinoamericana de Historia de las Ciencias y la Tecnologia

La Sociedad Latinoamericana de Historia de las Ciencias y la Tecnologia began publication of QUIPU (The Latin-American Journal of the History of Science and Technology) in 1984. The journal, which will be published three times a year, is intended primarily as a forum for Latin American scholars' research on the scientific history of their countries.

Individual subscriptions are \$12 annually (institutions \$25) and may be obtained from: QUIPU, Apartado Postal 21-783, C.P. 04000 Mexico, D.F., Mexico.

Rivista di Storia della Scienza

The first issue, published in March 1984, contains 4 major articles of which 3 are in English; one is by E. Amaldi on neutron research in the 1930s, another is by G. Battimelli on statistical theories of turbulence. There is one article in Italian, by G. Israel, on V. Volterra's views on physics in the early 20th century. Subscriptions are \$30 for libraries and institutions in the U.S., \$25 for individuals; order from Revista..., Edizioni Theoria, Via Domodossola 11, 00183 Roma, Italy.

Synthesis

Not to be confused with other journals with similar titles, this is "The Student Journal of the History and Philosophy of Science" published at the History of Science Department, Science Center 235, Harvard University, Cambridge, MA 02138. Current editors in chief are Sarah Tracy and Thomas A. Houpt. The spring 1984 issue includes articles on "Einstein, Newton, Mach and Leibniz" and "Roger Bacon and Medieval Arabic Optics." Subscriptions are \$10/year (\$12 overseas) for 4 issues

Tijdschrift voor de Geschiedenis der Geneeskunde, Natuurwetenschappen, Wiskunde en Techniek

This journal for the history of medicine, science, mathematics and technology has been published since 1978 by the Dutch GeWiNa-society. Articles are in Dutch; starting in 1981, English summaries are also provided. Four times a year, about 48 pages per issue. Recent issues have included articles on theories of matter in the 19th century, and semiconductor research at N. V. Philips' Gloeilampenfabrieken (1930-1955). Library subscriptions, f46 p.a.; order from Editions Rodopi B.V., Keizersgracht 302-304, 1016 EX Amsterdam, The Netherlands. Individuals may apply for membership in the GeWiNa, which includes a subscription to the journal, at f 40 p.a.; write to Dr. J. W. Van Spronsen, Veenendaalkade 463, 2547 AL 's-Gravenhage, The Netherlands.

Uppsala Newsletter History of Science

Published approximately twice a year by the Office for History of Science, Uppsala University, Box 256, S-751 05 Uppsala, Sweden; sent free on request. The editor is Tore Frängsmyr. All articles are in English.

SUMMARIES

Authors of books and articles on the history of physics are invited to send summaries for publication in this section. Maximum lengths: 75 words for articles, 150 words for books. (Longer summaries may be published of papers presented at Division symposia.) In addition, for articles please give author's mailing address and indicate whether reprints are available; for books published outside the U.S., indicate the U. S. distributor (if any) or complete mailing address of publisher, and give the price in U. S. dollars, including cost of mailing (if applicable). We can also publish summaries of papers presented at meetings if the author is willing to distribute preprints; otherwise, if copies are not available but the author is willing to correspond with others about the research, a summary may be submitted for the "Work in Progress" section. Publication will be expedited if each summary is typed, on a separate sheet, in the format of the examples below.

CARTESIAN RULES

BURCH, CHRISTOPHER. Descartes' Rules of Impact: Interface between Metaphysics and Natural Philosophy, presented at the Seventeenth World Congress of Philosophy, August 23, 1983, pp. 8.

Descartes' Impact Rules play an important part in his philosophical system. While anchored in metaphysical principles, and partially metaphysically justified, these Rules are intended to provide a mechanical basis for ranges of phenomena, and are acknowledged as empirically false. In establishing the place of the Rules, one can better appreciate the systemic goals of Descartes' metaphysics, and identify the reasons for the different methods employed in the metaphysical and physical parts of *Principia Philosophiae*.

Author's address: Christopher Burch, Dept. of Physics, S.U.N.Y. @ Oswego, Oswego, NY 13126.

INTUITIVE SPACE

WINTERBOURNE, A. T. Incongruent Counterparts and the Intuitive Nature of Space. *Auslegung*, 1982, 9(1): 85-98.

What can enantimorphic objects reveal about the nature of space? The *locus classicus* of this problem in Kant is considered. It was originally regarded as a pro-Newtonian, anti-relationist argument, but was successively modified by Kant into the mature doctrine of transcendental idealism. This solution to the problem of opposite-handed objects in relation to three-dimensional space transforms the problem of space as an independently subsisting framework to the idea of space as a subjective intuition.

Photocopies free from Dr. A.T. Winterbourne, Birmingham Polytechnic, Margaret Street, Birmingham, United Kingdom.

GALILEO

NAYLOR, R.H. Galileo's early experiments of projectile trajectories. *Annals of Science*, 1983, 40: 391-94.

Critique of S. Drake's interpretation of a manuscript; followed by Drake's comment, *ibid.*, 395, and Naylor's reply, *ibid.*, 396.

Author's address: Division of Philosophy, Thames Polytechnic, London SE18 6PF, England, U.K.

ALHAZEN'S PROBLEM

SABRA, A. I. 'Ibn al-Haytham's Lemmas for Solving "Alhazen's Problem"'. *Archive for History of Exact Sciences*, 1982, 26: 299-324.

The problem known since the 17th century as "Alhazen's Problem" consists in finding the point of reflection on a concave or convex mirror which may be spherical, cylindrical or conical in shape, given the positions of the eye and the visible object. Seventeenth-century mathematicians became acquainted with the problem through Risner's edition (Basel, 1572) of the medieval Latin translation of Alhazen's *Optics* (*Kitab al-Manazir, Perspective*), originally written in Arabic in the 11th century. This article presents an analysis and full translation of six lemmas that form the basis of Alhazen's treatment of the problem to which he devoted a considerable part of Book V of his *Optics*.

Author's address: A.I. Sabra, Dept. of History of Science, Harvard Univ., Science Center 235, Cambridge, Mass. 02138.

INTERPRETATION
OF ARISTOTLE

BOLZAN, J.E. Aristóteles y el peso del aire. *Archives Internationales d'Histoire des Sciences*, 1982, 32: 52-67.

Aristotle was a careful observer of nature, but his statement that an inflated bladder weighs more in the air than one empty (*De caelo*, 311 b 8 ff) seems to be wrong (cf. Archimedes Principle). Bearing in mind the commentators and rejecting several possible causes of mistake (steam in insufflated air; over pressure of insufflation; inaccuracy of balances; etc.) we attempt a new explanation of Aristotle's statement basing our ideas on: 1) the distinction between "own region" ($\alpha\delta\tau\omicron\upsilon\ \chi\omega\rho\alpha$) and "own place" ($\alpha\delta\tau\omicron\upsilon\ \tau\omicron\tau\omicron\delta$) of the air; 2) the Aristotelian theory of composition of *mixta*; 3) the interpretation of the verb $\epsilon\lambda\kappa\omega$ with the meaning of "to thrust up" and not "to weigh".

For free reprints write to Prof. Dr. J.E. Bolzan, Centro de Investigaciones Filosófico-Naturales, Cassilla de Correo 529, La Plata, Argentina.

MEDIEVAL EUCLID

THEISEN, WILFRED R. Euclid's *Optics* in the Medieval Curriculum. *Archives Internationales D'Histoire des Sciences*, 1982, 32: 159-176.

Euclid's *Optics*, like the *Elements*, was available in several translations, from the Arabic and Greek, and existed in many versions. Its popularity in the 13th century university curriculum was due to two factors: 1) it was a good example of applied mathematics and 2) it provided students with an opportunity to develop their critical and analytical skills in mathematics. Marginal notations show that the teachers took a critical stance *vis a vis* the text and often found Euclid at fault.

Author's address: St. John's Abbey Collegeville, MN 56321

NEWTONIAN COSMOS

CASTILIEGO, DAVID. The Expanding Force in Newton's Cosmos, As Shown in his Unpublished Papers. 125 pp. Madrid: Ediciones de Arte y Bibliofilia, 1981. Also available from Godfrey Cave Associates, London. 42 Bloomsbury St., London WX18 3QF.

Reviewed by Dobbs in Isis 1982, 73: 470. Castilliego argues that Newton sought a single expanding force in the cosmos, similar but inverse to the contracting force of gravity and responsible for building ordered structures - historical structures in time as well as physical structures in space.

EARLY
CLOUD ELECTRICITY

FEW, A. A. Franklin's Legacy to Cloud Electricity. Presented at the meeting of the American Geophysical Union, May 1983. [From EOS, 1982, 63:412]

Benjamin Franklin's contributions to the various disciplines of geophysics were described in the Bicentennial Issue of EOS (Pomerantz, 1976), wherein Franklin is called "The Compleat Geophysicist." It is appropriate at this Philadelphia meeting of AGU that we again reflect upon Franklin's contributions. In this paper we will concentrate on his research in Cloud Electricity, a field in which Franklin gained worldwide recognition and a field in which the present day practitioners recognize their Franklin Legacy.

Franklin began experimenting with electricity in 1746 at the age of 40 and pursued this work intensely for a period of 11 years after which his obligations to the growing American revolutionary movement required an increasing proportion of his time. He maintained, with the help of family and friends, continued experiments in cloud electricity until his death in 1790. During this period most of the research problems of cloud electricity were formulated; many of these problems are still being investigated.

Modern researchers aided by high-technology instruments are finally resolving some of these long-standing problems of cloud electricity. Were Franklin around today he would surely be in the middle of this thunderstorm research activity. As he commented having thought of the kite experiment, "Let the experiment be made!"

Author's address: A.A. Few, Dept. of Space Physics and Astronomy, Rice Univ., Houston, TX 77251

Martin A. Pomerantz. Benjamin Franklin - The compleat geophysicist, EOS, Trans. AGU, 1976, 57: 492-505.

MECHANICAL PHILOSOPHY

BURCH, CHRISTOPHER. Descartes and Huygens: Foundational Differences in the Mechanical Philosophy. Abstracts of the Seventh International Congress of Logic, Methodology and Philosophy of Science, 1983, 6: 34-37.

Descartes and Huygens worked in the mechanical tradition in natural philosophy, which may be defined as the commitment to explain natural phenomena solely in terms of matter, motion and impact. However, in each of these explanatory criteria Huygens held a conception radically different from Descartes'. This paper outlines foundational differences on the nature of matter. Surface similarities cannot be taken as definitive of similarities in theory or commitment, they must be explained.

For revision of Congress paper write: Christopher Burch, Dept. of Physics, S.U.N.Y. @ Oswego, Oswego, NY 13126.

FOUCAULT'S EXPERIMENT

ACLOQUE, Paul. Oscillations et stabilité selon Foucault: Critique historique et expérimentale. Paris: Editions du Centre National de la Recherche Scientifique, 1981 149 pp., paperback Fr60. Rev. by J.F. Bell in Isis 1982, 73: 474.

"In addition to clarifying the significance of Foucault's experiment demonstrating the rotation of the earth, Acloque's book provides fresh material for those interested in understanding the relationship between the experimentalist and the theorist in mathematically oriented fields like mechanics."

LUNAR
EFFECTS ON MOTION

CROWELL, A. D. Motion of the Earth as viewed from the Moon and the Y-suspended pendulum. American Journal of Physics, 1981, 49: 452-454.

In the early nineteenth century James Dean published a description of the effects of the librations of the moon on the apparent motion could be simulated by that of a Y-suspended pendulum. Within a short time Nathaniel Bowditch published a complete analysis of the two dimensional oscillator, including derivations and drawings of the mathematical curves known as Lissajous figures.

For reprints write to Prof. A. D. Crowell, Dept. of Physics, University of Vermont, Burlington, VT 05405.

HUYGEN'S MODEL

BURCH, CHRISTOPHER. Huygens' Pulse Models as a Bridge between Phenomena and Huygens' Mechanical Foundations. Janus, 1981, 68: 53-64.

Traité de la Lumière provides a sequence of models, each an improvement on its predecessor, for the rectilinear propagation of light. The first derives from the row-of-spheres construction of De Motu Corporum ex Percussione. The second advances to the generation of imperceptible, secondary pulses. The third produces perceptible pulse fronts which generate explanations of reflexion and refraction. These models connect Huygens' mechanical foundations in De Motu with the optical phenomena of the Traité.

Author's Address: Christopher Burch, Department of Physics, S.U.N.Y. @ Oswego, Oswego, NY 13126.

AMPERIAN
ELECTRODYNAMICS

HOFFMAN, JAMES R. Ampère's Research Programme in Electrodynamics: a brisk recovery from an early case of 'Kuhn loss.' Presented at the Seventh Regional Conference on the History and Philosophy of Science, Boulder, Colorado, April 28-30, 1983.

I argue that Lakatos' methodology of scientific research programmes (MSRP), as revised by Zahar and Worrall, provides conceptual and terminological resources suitable for an accurate rendition of an important development in Ampère's revolutionary research programme in electrodynamics. In particular, Ampère employed criteria strikingly similar to the "heuristic strength" and "progressiveness" constitutive of Worrall's version of the MSRP to assess the implications of Savart's 1822 derivation of the inverse square law of magnetism from Ampère's electrodynamics force law.

For free copies write to: James R. Hoffman, Dept. of History and Philosophy of Science, 1017 CL University of Pittsburgh, Pittsburgh, PA 15260

SELF-INDUCTION CONTROVERSY

JORDAN, D.W. The adoption of self-induction by telephony, 1886-1889. *Annals of Science*, 1982, 39: 433-461.

A spectacular chain of controversies about phenomena arising from self-induction in electrical measurement, telephony and lighting conductors, involving O. Heaviside, Lord Rayleigh, W. Preece, S.P. Thompson, O. Lodge, W. Aryton, W. Thomson and others, was influential in establishing the credibility of electromagnetic theory amongst practitioners.

Author's address: D.W. Jordan, Department of Mathematics, University of Keele, Keele, Staffordshire, ST5 5BG, England.

RAYLEIGH

HEY, J.D. From Leonardo to the Graser: Light scattering in Historical Perspective. Part II. *South African Journal of Science*, 1983, 79: 310-24.

The life and work of John William Strutt, third Baron Rayleigh, are reviewed with particular reference to his major contributions to the field of molecular light scattering.

Author's address: Department of Physics, University of Cape Town, Rondebosch 7700, South Africa

HUGHE'S INDUCTION BRIDGE

JORDAN, D.W. D.E. Hughes, self-induction and the skin effect. *Centaurus*, 1982, 26: 123-153.

A year long and very public controversy on the interpretation of Hughes's January 1885 induction bridge experiments before the Society of Telegraph Engineers and Electricians of London resulted in clarifications of unfamiliar features of unfamiliar current propagation, with far-reaching effects on the attitudes of electrical engineers towards theoretical electrical science.

Author's address: D.W. Jordan, Department of Mathematics, University of Keele, Keele, Staffordshire, ST5 5BG, England.

KINETIC MATTER

MENDOZA, ERIC. The kinetic theory of matter, 1845-55. *Archives Internationales d'Histoire des Sciences*, 1982, 32: 184-220.

Creating a convincing dynamical theory of heat to replace static caloric theory demanded much more than merely explaining the pV-RT laws. The problem was to build a complete theory of matter, not just of gases. This paper describes early work on latent heat, diffusion, the speed of sound, among other topics - all before Kronig entered the scene. Little-known experiments by Joule and Waterton (who measured molecular diameters 8 years before Loschmidt) are also described.

Author's address: Israel Science Teaching Centre, The Hebrew University, 91904 Jerusalem.

EFFECTS OF STATISTICAL THOUGHT

PORTER, THEODORE M., *The Calculus of Liberalism: The Development of Statistical Thinking in the Social and Natural Sciences of the Nineteenth Century*. Ph.D. Dissertation (Princeton University, 1981). 365 pp. University Microfilms International, 300 N. Zeeb Rd., Ann Arbor, MI 48106. Order no. 8127751. Microform, \$10; paperback, \$20 (academic purchasers).

This is a study of the introduction of statistical reasoning to nineteenth-century science, emphasizing Adolphe Quetelet's "social physics," James Clerk Maxwell's kinetic gas theory, Francis Galton's work on heredity, and Francis Edgeworth's techniques for estimating changes in the value of money. It argues for the importance of the belief that systems of freely-moving individuals can be expected to generate order in the large, even when the constituent members are too numerous or too complex to be studied separately, an idea whose origins are to be found in the empirical social science that bore the name "statistics" during the nineteenth century. The development of the relatively simple mathematics involved in this work, and the accomplishment of the very difficult task of applying it to systems in the real world, is portrayed as truly interdisciplinary activity, in which scientists found the basis for applying statistical models to their own field in perceived analogies of its objects with those of other disciplines that had previously incorporated statistical reasoning.

Author's address: Division of Humanities and Social Sciences, California Institute of Technology, Pasadena, CA 91125.

CROOKES' QUEST

DEKOSKY, ROBERT K. William Crookes and the Quest for Absolute Vacuum in the 1870s. *Annals of Science*, 1983, 40: 1-18.

This essay examines the technical evolution and scientific context of William Crookes' effort to achieve an absolute vacuum in the 1870s. Prior to late 1876, along with interrogation of the radiometer effect, the quest for perfect vacuum was a major motive of his research programme. At this time, no absolutely dependable method existed to determine exactly the pressures at extreme rarefactions. Crookes therefore employed changes in radiometric, viscous and electrical effects with changing pressure in order to monitor the progress of exhaustion. After late 1876, his research priorities shifted because he had reached a plateau of technical accomplishment in the effort to attain extreme vacua, and because observed effects in vacua--particularly electrical--assumed an importance in their own right, and as bases for elucidation and defence of his concept of a 'fourth state of matter' at very low pressures.

Author's address: Robert K. DeKosky, Department of History, University of Kansas, Lawrence, Kansas 66044.

NEUMANN'S ELECTRODYNAMICS

ARCHIBALD, T. Carl Neumann vs. Rudolf Clausius on the propagation of electrodynamic potentials. Presented at Joint Atlantic Seminar in the History of the Physical Sciences, Washington, D.C., April 8-9, 1983.

In an attempt to resolve questions regarding the relationship between Wilhelm Weber's velocity-dependent force law for electrostatics and the *vis viva* principle, Carl Neumann proposed in 1868 an expression for electrodynamic potential from which Weber's force law could be derived, and showed that by treating the potential as propagated with finite velocity that the corresponding *vis viva* would be conserved. Two features of Neumann's method interest us in this paper. The first is the picture of interaction that he employs, which he at first claimed was analogous to that used in optics. The second is Neumann's "variational" procedure for the derivation of the force from his velocity-dependent potential, and the related formulation of the problem using Hamilton's principle.

Author's address: Institute for the History and Philosophy of Science and Technology, Room 36, Victoria College, University of Toronto, Toronto, Canada M5S 1K7.

RECURRENCE PARADOX

STECKLINE, VINCENT S. Zermelo, Boltzmann, and the recurrence paradox. American Journal of Physics, 1983, 51: 894-897.

The papers exchanged by Ludwig Boltzmann and Ernst Zermelo concerning the recurrence paradox are summarized. The historical context of the paradox, Zermelo's proof of the paradox, his opinions of its consequences, Boltzmann's reply, and the ensuing discussion are described.

Author's address: Ridgefield Memorial High School, Ridgfield, New Jersey 07657

EINSTEIN AS A MODEL

JR. LEMON, DOROTHY RIEBER. When Einstein sat for my mother. New Age, March 1983, 8(8): 40-43. Reprinted from 50 Plus, June 1982.

Winifred Rieber painted Einstein's portrait in 1934. This article consists of extracts from letters to her husband about their conversations.

REPRINTS ON GRAVITY

WORDEN, P.W., Jr.; C.W.F. EVERITT, eds. Gravity and Inertia: Selected Reprints. 131 pp. Stony Brook, NY: American Association of Physics Teachers, 1983. \$5.00 postpaid, \$5.50 with shipping cost.

Contents: "Resource Letter GI-1: Gravity and Inertia" by Worden & Everitt (1982); "Einstein on the Firing Line" (1972) by C.M. Will; "Relativistic Experiments in Gravitational Fields" (1978) by V.N. Rudenko; "Experimental verification of the General Theory of Relativity" (1979) by R.D. Reasenberg & I.I. Shapiro; "Tests of General Relativity using Astrometric and Radio Metric Observations of the Planets" (1978) by J.D. Anderson et al.; "What is the Principle of Equivalence" (1977) by H.C. Ohanian; "Gravitational-Wave Astronomy" (1978) by J.A. Tyson & R.P. Giffard.

Order from AAPT, Publications Department, Graduate Physics Bldg., S.U.N.Y., Stony Brook, NY 11794.

HISTORY OF ISOSPIN

KEMMER, N. Isospin. Pp. C8-359, C8-393 in Colloque International sur l'Histoire de la Physique des Particules. Paris: Editions de Physique, 1982.

The history of isospin is described, starting from the introduction by Heisenberg (1932) of the concept (ρ -spin), associated with the idea that proton and neutron are two states of the same entity (later to be called "nucleon"). It is stressed that from the start Heisenberg had the picture of the transmission of proton-neutron interaction by a charged agent (field) in mind. It is shown that, in contrast, Majorana's modification of Heisenberg's interaction scheme rejected the isospin formalism and moved away from a field picture.

The revival of the isospin idea by Cassen and Condon (1934) on the basis of the "charge-independent" description of nucleon-nucleon interaction and the formal "iso-invariance" of that interaction is discussed. The consequent wide application of the isospin idea in nuclear structure theory is described, in particular the introduction (Wigner, 1937) of the total isospin vector of a system of nucleons, of isospin multiplet classification of states and of applications to nuclear reactions, β -decay, etc.

The introduction of isospin into field theories of nucleon-nucleon interaction is described: the charge independent extension first of the Fermi (β, ν) field (Kemmer, 1937) and then of the Yukawa field (Kemmer, 1938). A brief account is given of the consolidation of the "symmetric theory" of the isospin of the nucleon-pion system, following the postwar experimental proof of the existence of the pion isotriplet and the improvement in the understanding of field theories in terms of the renormalisation concept. The application of this iso-invariance of the (N- π) system in the description of a wide range of phenomena (weak interactions) is sketched.

The first step into non-abelian gauge theory - the Yang-Mills iso-vector gauge field - is briefly described, concluding with brief remarks on the status of isospin within the framework of modern particle theory.

NATIONALISM IN

HIGH ENERGY PHYSICS

HODDESON, LILLIAN. Establishing KEK in Japan and Fermilab in the US: Internationalism, Nationalism and High Energy Accelerators. Social Studies of Science, 1983, 13: 1-48.

Comparison of the prehistories of the Fermi National Accelerator Laboratory (Fermilab) in the US, and Ko Enerugii Butsurigaku Kenkyusho (KEK) in Japan, reveals the working of both internationalism and nationalism in high energy physics. International communication and competition helped to create a number of structural parallels from the 1930s to the 1960s; for example, in the postwar period both countries formed their first inter-university government-supported accelerator laboratories; at the turn of the 1960s nuclear physicists in both countries debated about the choice of design for their next higher energy accelerator; and both chose proton synchrotron designs traceable to a common conceptual root. Although Fermilab and KEK progressed through analogous stages in 1960-65, national circumstances caused these developments to diverge in the late 1960s, resulting in a sizeable cut in scale and costly delays in the establishment of KEK.

Author's address: Lillian Hoddeson, Department of Physics, University of Illinois, 1110 W. Green St., Urbana, IL 61801

REPRINTS ON HELIUM

HALLOCK, ROBERT B., ed. Superfluid Helium: Selected Reprints. 148 pp. Stony Brook, NY: American Association of Physics Teachers, 1983, \$5.00 postpaid, \$5.50 with shipping cost.

Includes: "Resource Letter SH-1: Superfluid Helium" (1982) by Hallock, and papers by J.F. Allen & H. Jones (1938), F. London (1938), J.G. Daunt & K. Mendelson (1939), P.L. Kapitza (1941), E. Andronikashvili (1946), V. Peshkov (1946), K.R. Atkins (1959), D.V. Osborne (1950), W.F. Vinen (1958), G.W. Rayfield and F. Reif (1963), E.J. Yarmchuk et al. (1979), I. Rudnick & K.A. Shapiro (1962), J.D. Reppy & D. Depatie (1964), K.L. Telschow & R.B. Hallock (1976), D.R. Nelson & J.M. Kosterlitz (1977), D.J. Bishop & J.D. Reppy (1978), G.K. Walters & W.M. Fairbank (1956), E.H. Graf et al. (1967), W.R. Abel et al. (1966), D.D. Osheroff et al. (1972), R.A. Webb et al. (1973), D.T. Lawson et al. (1973), J.E. Berthold et al. (1976).

Order reprints from AAPT, Publications Dept., Graduate Physics Bldg., S.U.N.Y., Stony Brook, NY 11794

EARLY MAGNETOSPHERE RESEARCH

DUNGEY, JAMES W. Early History of Magnetic Reconnection. Presented at the meeting of the American Geophysical Union, May 1983. [From EOS, 1982, 63:412]

Extensive observation suggested to Giovanelli a connection between magnetic neutral points and solar flares and he pointed out the importance of electron runaway. Hoyle's development included the concentration of current at a neutral point. He also proposed application to the aurora, implying an open magnetosphere in today's jargon, and gave the problem to me for my Ph.D. project. Developments up to 1960 will be described and the tearing mode and Petschek model merely mentioned.

Author's address: James W. Dungey, Institute of Geophysics & Planetary Physics, University California, Los Angeles, CA 90124.

RADIO ASTRONOMY

SULLIVAN, W.T. Classics In Radio Astronomy. xxi + 337 pp., Boston, MA: D. Riedel Publishing Company, 1982. \$59.50.

Radio astronomy has revolutionised our knowledge of the universe, yet little attention has been paid to its history. In this volume, Sullivan has selected and analysed 37 key papers which, for the period 1896 to 1954, chart the field as it evolved from a minor aspect of ionospheric radio physics into a major force in astronomy. After the pioneering, lone observations of the Milky Way by Jansky and Reber, the bulk of the articles cover the 1946-52 period which saw startling discoveries such as radio bursts from the sun, the first discrete sources and their optical identification, and the 21-cm line of neutral hydrogen. Developments related to theory and techniques are also well represented. The collection is considerably enhanced and united by extensive historical and scientific commentary which introduces each section and paper.

AUSTRALIAN PHYSICS

HOME, R.W. Origins of the Australian physics community. Historical Studies, 1983, 20: 383-400.

Sketches the growth of a viable community of physicists in Australia in the 1920s and '30s, and in particular the awakening of professional concerns among Australian physicists as a group during this period.

Author's address: Department of History and Philosophy of Science, University of Melbourne, Parkville, Vic. 3052, Australia.

S-MATRIX THEORY

GRYTHE, INGE: Some remarks on the early S-matrix. Centaurus, 1982-83, 26: 198-203 pp.

Between 1930 and 1948 quantum electrodynamics was in serious trouble. This inspired W. Heisenberg in 1943 to formulate an alternative theory based on the scattering-matrix. This S-matrix theory, however, suffered a serious blow in 1946 when S.T. Ma discovered S-matrix' poles with no physical interpretations.

This article is largely based on the late Danish professor C. Møller's correspondence with leading physicists from this epoch.

Author's address: Inge Grythe, Roervikvn 1, N 1560 Larkollen, Norway.

MORE

AUSTRALIAN PHYSICS

HOME, R.W. Between classroom and industrial laboratory: the emergence of physics as a profession in Australia. Australian Physicist, 1983, 20: 163-167.

Argues that the emergence of physics as a profession in Australia is to be dated to the late 1930s, when satisfactory career paths for new graduates became established for the first time. Emphasizes the need in considering such questions to take account not just of the research physics community but also of those engaged in more workaday positions in industrial and applied physics.

Author's Address: Department of History and Philosophy of Science, University of Melbourne, Parkville, Vic. 3052, Australia.

MAGNETIC MOMENT MEASUREMENTS

RIGDEN, JOHN S. Molecular Beam Experiments on the Hydrogens During the 1930's. Historical Studies in the Physical Sciences, 1982, 13: 335-374.

Experiments to measure the magnetic moments of the proton and the deuteron were initiated by Stern in 1933 and concluded by Rabi in 1940. The series of experiments started with a surprise: the magnetic moment of the proton was three times larger than predicted from Dirac theory. The series also ended with a surprise discovery: the deuteron's electric quadrupole moment. The final discovery was made possible by the development of very precise experimental methods.

For reprints write to: John S. Rigden, Department of Physics, University of Missouri - St. Louis, St. Louis, MO 63121.

NEUTRAL CURRENTS

GALISON, PETER. How the first neutral current experiments ended. Reviews of Modern Physics, 1983, 55: 477-509.

At the beginning of the 1970's two remarkable neutrino experiments led to the discovery of neutral currents. We ask here: What kind of evidence and arguments persuaded the participants that they had before them a real effect and not an artifact of the apparatus? What eventually convinced them that their experiment was over? An answer to these questions requires an examination of the organization of the experiments, the nature of the apparatus, and the previous work of the experimentalists. Finally, some general observations are made about the recent evolution of experimental physics.

For reprint write to P. Galison, Lyman Laboratory of Physics, Harvard University, Cambridge, MA 02138.

GEOPHYSICS BIBLIOGRAPHY

SCHRÖDER, W. Historisches in der Zeitschrift für Geophysik Mitteilungen. Arbeitskreis Geschichte der Geophysik, Juni 1983, 2(Heft 1): 8-11.

List of biographical and historical articles which appeared in this journal. 1927-1971.

BRAGG AND MADSEN

HOME, R.W. W.H. BRAGG and J.P.V. MADSEN: collaboration and correspondence, 1905-1911. Historical Records of Australian Science, 1981, 5(2): 1-29.

Publishes, with commentary, 9 letters that passed between Bragg and Madsen, Bragg's last and most important collaborator during his Australian period, during the period 1906-1911. Two related letters between Rutherford and Madsen are also included. The letters provide new detail concerning Bragg's work in Australia and during the first years following his return to England, and in particular on his dispute with Barkla over the nature of X-rays and γ -rays.

Author's address: Department of History and Philosophy of Science, University of Melbourne, Parkville, Vic. 3052, Australia.

PROMOTION OF SCIENCE

GORAN, MORRIS. Can Science Be Saved? Palo Alto, CA: R & E Research Associates, Inc., 1982, \$9.95. (Individual orders, add \$1.50 for postage & handling.)

Treats three chief difficulties of modern science, money, department and relations with others, in specific terms. The book details events and individuals in a straightforward manner, with abundant citations to appropriate literature.

The book not only analyzes but also describes means for the promotion of science. A powerful money supply is suggested, ways to enhance professionalism are outlined, and procedures for gaining non-scientist support are indicated.

Author's address: Morris Goran, Physical Science Department, Roosevelt University, Chicago, IL 60605.

SOLID STATE
AND ELASTICITY

MENDOZA, ERIC. The equation of state for solids 1843-1926. European Journal of Physics, 1982, 3: 181-187.

An episode in physics - the attempts to find a connection between the expansion of a solid by heat and its ability to be deformed elastically. The expression which emerges (nowadays called Grüneisen's relation) was the same on caloric and dynamical theories, though some of the 'proofs' depended on surprisingly shoddy mathematics. The relation was only accepted in 1926 when it was recognized that interatomic forces in solids are not of a universal character.

Author's address: Israel Science Teaching Centre, The Hebrew University, 91904 Jerusalem.

ATKINSON'S OBITUARY

HONEYCUTT, R. KENT. [Obituary of] Robert d'Escourt Atkinson. Physics Today, May 1983, 36(5): 81-82.

Atkinson died 28 October 1982 at age 84. He was best known for his application of nuclear physics to stellar structure; a 1929 paper with F.J. Houtermans gave the first qualitative theoretical description of nuclear energy generation in stars.

SUBSCRIPTIONS FOR VOLUME II

Members of the American Physical Society may join the Division of History of Physics and receive this Newsletter at no additional cost. Others may subscribe at \$10 per volume (5 issues, published twice a year), \$15 outside North America (sent by air mail). Because of the cost of processing foreign checks, we prefer that foreign subscribers pay for two volumes at a time.

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EINSTEINIANA

\$750,000 for 1900-1914

The National Science Foundation has awarded \$750,000 for 5 years of editorial work on the publication of the Einstein papers at Princeton University Press. The grant is expected to cover the preparation of Einstein's papers for the years 1900-1914, when he formulated the special theory of relativity, developed the quantum theory (including the explanation of the photoelectric effect, for which he received the Nobel Prize) and took the most important steps toward the general theory of relativity. Einstein's writings will be published in about 38 volumes during the next 30 years. (See *Physics Today*, March 1984, p. 91)

38,500 for Unified Field Theory

A draft of Albert Einstein's "Unified Field Theory" sold for \$38,500 at Sotheby's auction house in New York. The autographed 6-page 1929 manuscript was purchased by an unidentified Massachusetts dealer; it came from the private collection of John Stanitz of Cleveland. (Reuters dispatch, published in *The Washington Post*, 26 April 1984, p. B3)

6 for the Best

According to an article by Walter Sullivan in the *New York Times*, 14 February 1984, "Contrary to a popular legend that has given comfort to countless slow starters, young Albert Einstein was remarkably gifted in mathematics and excelled in physics."

Einstein's report card at the Aargau School in Switzerland for 1895 and 1896 shows that he received grades of 1 or 2 for mathematics, physics, chemistry, and music (violin) for the first two quarters, but his grades in the next quarter were 5 or 6. At first sight this might seem to indicate an academic disaster, but intensive research into the history of grading policies at the Aargau School disclosed that the system was actually reversed in the first term of the 1896-97 year; previously the highest grade was 1 and the lowest 6, but now it was just the opposite. So Einstein stayed on top in his own frame of reference.

HISTORY OF PHYSICS NEWSLETTER

Volume II, Number 1 -- September 1984

Contents

DIVISION NEWS: Meetings, Election Results, Call for Nominations, Executive Committee Meeting, Program Committee, Fellowships (APS)	1
Book Prize; Membership; Joint Atlantic Seminar; Jobs	3
GUEST EDITORIAL (A.I. Miller)	4
CONFERENCES: Faraday, SHOT, 4S, HSS, Midwest Junto, International History of Science Congress, Experiment	5
PERSONALIA: Cohen, England, Friedel, Gillmor, Miller, Porter, Veltman, Vucinich	5
GRANTS & FELLOWSHIPS: Austrian History; Babbage Institute; Dudley Observatory; NEH; NSF-EVIST; NSF-HPS; Smithsonian	6
QUERIES: Vienna physicists; Humor	6
REPORTS: Victorian mathematical physics; Women in Physics; Chermwell Papers; Mendelssohn Papers; Chemical atomic theory; Trial of Galileo; A New Mechanism?; History for British Physicists; Boston Colloquium	7
Quantum Physics Archive in London; Mathematics; 19th century science	8
BOOK SERIES: Science & Philosophy; CERN History Study Reports	8
AUDIOVISUAL MATERIALS: Fission & Pulsar; Atoms & Expanding Universe	8
ANNOUNCEMENTS: Booksellers	8
JOURNALS AND SOCIETIES	9
SUMMARIES	10
SUBSCRIPTIONS	15
EINSTEINIANA	16

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