History of Physics Newsletter

VOLUME II, NUMBER 2 FEBRUARY 1985

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" [Crystal City, VA] (24-27 April). The Annual Business Meeting will be at Crystal City at the end of the session on 26 April.

Toronto: History of Science Research

The Division of History of Physics symposium at the APS/AAPT meeting in Toronto will be devoted to "Current Topics of Research in the History of Science." The session is arranged and chaired by **John Rigden** (University of Missouri) and will begin at 10 AM on Wednesday, January 23 (see APS Bulletin, session GB, for details). The following papers will be presented:

"Faraday and Ampère: The conflict of two scientific cultures" - **L. Pearce Williams**, Cornell.

"James Clerk Maxwell: Victorian Physicist" - **Paul Theerman**, Smithsonian.

"Galileo and Physical Measurement" - **Stillman Drake**, University of Toronto.

Election of Division Officers

Ballots will be mailed to all Division members within a few weeks. The following positions are to be filled: Vice-Chairperson (to become Chairperson the following year); Secretary-Treasurer (3-year term); two members of the Executive Committee (3-year terms).

Bohr Commemorative Sessions

At the American Physical Society Spring Meeting (previously known as the "Washington meeting") in Crystal City, VA, 26 April 1985, there are scheduled two "Niels Bohr Centennial Sessions." The morning session is co-sponsored by the Divisions of History of Physics and Nuclear Physics and is entitled "Niels Bohr's Life and Work." The speakers will be **Victor F. Weisskopf, Jørgan Kalckar, Martin Sherwin**, and **John Archibald Wheeler.** The session was organized by Wheeler and Arthur Miller and will be chaired by **Edward M. Purcell.**

The afternoon session is sponsored by the Division of History of Physics and is entitled "Niels Bohr and the Foundations of Physics." Speakers will be **Max Dresden, Arthur I. Miller, Robert S. Cohen** and **Roger H. Stuewer.** The session was organized by Arthur Miller and will be chaired by **Herman Feshbach.**

Business Meeting

The Annual Business Meeting of the Division, open to all members, will be held at the end of the afternoon session on Bohr (see above) on 26 April 1985 in Crystal City, VA. It is desirable but not essential that members wishing to bring up new business should notify the Secretary-Treasurer, S. G. Brush, in advance.

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). 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). 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 assistant: **James Beichler**, University of Maryland.

CONFERENCES

Experimenters and Instruments

The History of Physics Group of the Institute of Physics (see p. 21) will hold a one-day meeting at the Institute headquarters, 47 Belgrave Square, London, on 20 February 1985. The theme of the meeting will be "Experimenters and Instruments: The interaction between experimental skills and instrumental craftsmanship." The programme of talks will be as follows:

"Reflections on Crystals: Instrumentation for Crystal Structure Determination" - H. **Lipson**

"From Research to Development: The Development of the mechanical parts of electron probe instruments" - **D. Unwin**

"Could we repeat it: How far would it be possible to repeat an experiment from published papers describing it?" - **R. G. Stansfield**

"Are laboratory note-books a thing of the past?" - **N. Kurti**

For information contact John Roche, Linacre College, Oxford OX1 3JA, England, UK.

Uses of Experiment

A conference on "The Uses of Experiment: A Conference on Experimentation in the Natural Sciences" will be held at Newton Park College, Bath, England, 30 August-2 September 1985.

The character and uses of observation and experiment will be approached from historical, sociological and philosophical perspectives. Sessions will be arranged under several thematic headings, including:

1. Experimental instruments: Testing and Persuasion in Science and Technology. Contributions expected from **Ian Hacking** (Toronto), **William Hackmann** (Oxford), **Frank James** (Royal Institution), **Donald MacKenzie** (Edinburgh), **Simon Schaffer** (Cambridge), **Mari Williams** (LSE), others to be announced.

2. Experiment and Consensus-Formation. Contributions expected from **Harry Collins** (Bath), **Allan Franklin** (Colorado), **Peter Galison** (Stanford), **Gerry Geison** (Princeton), **Andrew Pickering** (MIT), **Steve Shapin** (Edinburgh).

3. Observation and the Construction of Experience; Experiment and Argument. Contributions expected from **H. Brown** (Illinois), **James Brown** (Toronto), **Patrick Heelan** (SUNY at Stony Brook), **Michael Lynch** (Walla Walla), **Ron Naylor** (Thames). **Thomas Nickles** (Reno), **Trevor Pinch** (York), **Martin Rudwick** (Cambridge), **Dudley Shapere** (Wake Forest), **Ryan Tweney** (Bowling Green), **John Worrall** (LSE), others to be announced.

Full details of the programme and accommodation will be available in May 1985. Until that date inquiries should be addressed to Dr. D. C. Gooding, Science Studies Centre, School of Humanities & Social Sciences, University of Bath, Bath BA2 7AY, England. The conference is organized by H. M. Collins, D. C. Gooding (both Science Studies, Bath), T. J. Pinch (Sociology, York), S. Schaffer (History of Science, Cambridge), and S. Shapin (Science Studies, Edinburgh). Sponsors include the British Society for the History of Science and the BSA Science Studies Group.

Those wishing to receive the programme and registration form should write to: "The Uses of Experiment," c/o Mrs. Nicola King, School of Humanities and Social Sciences, University of Bath, Bath BA2 7AY, England, UK.

Particles

An international history symposium on "Particle Physics in the 1950s: Pions to Quarks," will be held at Fermilab in Batavia, Illinois on 1-4 May 1985. The meeting will essentially cover the period of particle physics from the discoveries of the pion and strange particles and the building of the first large accelerators to the introduction of symmetry concepts and proposal of the quark.

Speakers will include: physicists **Murray Gell-Mann, Owen Chamberlain, Wolfgang Panofsky, W. Chinowsky, Jack Steinberger, Val Telegdi, Abraham Pais, George Rochester, Richard Dalitz, Matthew Sands, C. N. Yang, Edoardo Amaldi, Ugo Amaldi, Abdus Salam, Geoffrey Chew, Ernest Courant, Robert Hofstadter, Larry Jones, E. C. G. Sudarshan, Robert R. Wilson, Donald Kerst, Michiji Konuma, Louis Michel, Y. Nambu, Donald Perkins, Robert Marshak, Sidney Drell, Victor Weisskopf, Gerson Goldhaber, Sam Treiman, Emilio Segre, Robert L. Walker**; and historians **Peter Galison, SIlvan Schweber, Andy Pickering, Hywel White, Alan Franklin, Armin Hermann** and **John Heilbron.**

The chairpersons of the Symposium are **Laurie M. Brown, Max Dresden**, and **Lillian Hoddeson.** For information as it becomes available write to L. Hoddeson, Fermilab, P. O. Box 500, Batavia, IL 60510.

PERSONALIA

Hanle

Paul A. Hanle, one of the first members of the Executive Committee of the Division of History of Physics, has been promoted to Associate Director for Research at the National Air and Space Museum of the Smithsonian Institution in Washington, DC. He will have responsibilities for publishing, educational and university programs, among others. Hanle is currently working on a history of NASA's space telescope (to be launched in 1986) with Robert Kargon and Robert Smith.

Kline

Ronald R. Kline has been appointed Director of the IEEE Center for the History of Electrical Engineering in New York, succeeding Robert Friedel who has moved to the University of Maryland (HPN 2, 5). Kline's 1983 dissertation at the University of Wisconsin-Madison was on the life and career of Charles Proteus Steinmetz.

Wilson

Robert R. Wilson, professor of physics at Columbia and Cornell, and one of the first members of the Executive Committee of the Division of History of Physics, has been named one of two winners of this years Enrico Fermi Award by the U. S. Department of Energy. Wilson, the first director of the Fermi National Accelerator Laboratory, was honored for his contributions to particle-accelerator design and construction.

OBITUARIES

Klemm

Friedrich Klemm, born 22 January 1904, died 16 March 1983; his first major work was Die Geschichte der Emissionstheorie des Lichtes (1932), and he was well known for publications in the history of technology. See the notice by C. J. Scriba in Archives Internationales d'Histoire des Sciences, 1983, 33: 328-30.

JOBS

AIP-CHP

The Center for History of Physics at the American Institute of Physics seeks an Associate Historian. Applicant should hold a recent Ph.D. or a virtually complete dissertation in the history of modern physical science. Appointment will be for 1 to 3 years - in effect, a post-doctoral position. The historian will help conduct and administer the Center's well-known programs in oral history interviewing of physicists and astronomers, the preservation and cataloging of documents, and the use of historical materials for educational purposes. In particular, the historian will help catalog existing oral history interviews and conduct new ones. The historian will also have opportunities to pursue personal research interests in related areas. Salary is competitive. Work may begin at any mutually convenient time during 1985. Send letter, vitae, and names of 3 references to Spencer Weart, Center for History of Physics, American Institute of Physics, 335 East 45 Street, New York, NY 10017. AIP is an equal opportunity employer.

NASA

The NASA History Office is seeking an historian of modern science to serve as principal investigator in a 2-year project at NASA's Goddard Space Flight Center to (1) establish a GSFC historical documents collection and (2) research and write a history of space science and applications at GSFC. The Ph.D. in history of science is required, and some publishing experience is preferred. Deadline: February 1, 1985. Contact: Sylvia D. Fries, Director, NASA History Office, National Aeronautics and Space Administration, Washington, DC 20546; (202) 453-2999.

Guidelines for the preparation and submission of proposals for historical research in NASA-related aerospace science, technology, management and policy can be found in a Guide to Research in NASA History, available from the NASA History Office.

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; Vol. II, p. 6.

AIP-CHP

The American Institute of Physics' Center for History of Physics is continuing its program of small Grants-in-Aid for research in the history of 19th and 20th century physics and astronomy and their social interactions. Grants will be for a maximum of $1000 each and can be used only to reimburse direct expenses connected with research. Preference will be given to those who need the funds for travel to use the resources of the Center's Niels Bohr Library in New York City, or to microfilm papers or conduct tape-recorded oral history interviews with a copy deposited in the Library; other projects will also be considered but are less likely to be funded. Applicants should either be working toward a graduate degree in the history of science, or show a record of publication in the field. To apply, send a vitae and a letter of about 2 pages describing your research project and the expenses for which support is requested, to Spencer Weart, Center for History of Physics, American Institute of Physics, 335 East 45 Street, New York, NY 10017. Phone: (212) 661-9404. Deadline: December 15.

Hagley

The Hagley Museum and Library, in association with the History Department of the University of Delaware, offers a two- or four-year course of study leading to an M. A. or Ph. D. degree for students interested in careers as professionals in museums and historical agencies or as college teachers. The Hagley Program's focus is on the social history of American industrialization. Approximately six new fellowships are offered each year. In addition to all tuition for courses at the University of Delaware and a small travel allowance, fellows receive a yearly stipend of $5,600 for the first 2 years and $6,000 for the second 2 years. Application deadline is February 1. Contact Brian Greenberg, Coordinator, Hagley Graduate Program, Hagley Museum and Library, Box 3630, Wilmington, DE 19807

Hagley also offers Research Fellowships, funded by NEH and the Mellon Foundation, designed to promote integrative and comparative research into the social context and consequences of industrialization of the United States in the century following 1850. Scholars from any humanistic discipline or from related social sciences are encouraged to apply. The minimum residency is 6 months, and the maximum stipend is $25,000 for an academic year. NEH Fellowships may not be awarded to degree candidates or for study leading to advanced degrees. Application deadline is February 15. Contact: Glenn Porter, Hagley Museum and Library, Box 3630, Wilmington, DE 19807.

Smithsonian - Air & Space Museum

The National Air and Space Museum announces researach opportunities in the history of aerospace science and technology. Fellowships, internships, and appointments for visiting scholars are available. Students are encouraged to apply for support for resident study, to work closely with a museum staff member with similar interests.

The Daniel and Florence Guggenheim Fellowship provides support for predoctoral or postdoctoral students and is awarded annually on a competitive basis. Minimum academic requirement is current enrollment in a graduate program of history or science in an accredited college or university. Applicants for the postdoctoral fellowship should have received their Ph. D. within the past 5 years. The stipend is $11,000 (predoctoral) or $18,000 (postdoctoral). Deadline: January 15.

The Alfred V. Verville Fellowship is intended for the analysis of major trends and developments in aviation or space studies. Awarded annually on a competitive basis, it is open to all interested candidates who can bring a critical and analytical approach to aerospace studies, and who possess good writing skills. An advanced degree is not required.

The Charles A. Lindbergh Chair of Aviation History and the Space History Chair permit distinguished scholars a year of independent study.

The Museum offers a limited number of internships to undergraduate and graduate students for the fall, spring, and summer semesters to study a topic of interest to NASM. Applicants must be enrolled either in high school or in a degree program at an accredited educational institution. Moderate stipends are available.

Application packages for all chairs, fellowships, and internships may be obtained by writing to: Office of the Deputy Director, National Air and Space Museum, Smithsonian Institution, Washington, DC 20560.

SUMMER SEMINARS

The National Endowment for the Humanities will sponsor the following Summer Seminars for College Teachers in 1985; information and application materials should be requested from the Directors.

"Exact Sciences in Antiquity and the Middle Ages" (6/17-8/9) - **Asger Aaboe**, Department of the History of Science, c/o Yale Summer & Special Programs, 53 Wall Street, New Haven, CT 06520.

"Agreement and Disagreement in Science" (6/17-8/9) - **Larry Laudan**, Center for the Study of Science in Society, Price House, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061.

"The Social History of Modern Science" (6/24-8/16) - **Everett Mendelsohn**, Department of the History of Science, Science Center 235, Harvard University, Cambridge, MA 02138. This Seminar is open only to teachers in 2-year colleges.

"Reappraisals of the Scientific Revolution" (6/17-8/9) - **Robert S. Westman**, Department of History, University of California, Los Angeles, CA 90024.

For a list of other Summer Seminars or for application guidelines for prospective Seminar Directors write to Richard Emmerson, Program Officer, Division of Fellowships, National Endowment for the Humanities, Washington, DC 20506.

BOOK SERIES

Irish Science & Technology

The Royal Dublin Society publishes a series of Studies in the History of Irish Science and Technology. Because of the strength of the $ US, these books are of particularly good value to residents of the United States; the publisher will accept personal checks in $ corresponding to the price in Irish pounds. Of special interest to readers of HPN is a collection of essays on John Tyndall edited by W. H. Brock et al. For information write to R. Charles Mollan, Science Officer, Royal Dublin Society, Thomas Prior House, Ballsbridge, Dublin 4, Ireland.

Geophysics

The American Geophysical Union has announced an annual volume series, The History of Geophysics, edited by C. Stewart Gillmor. It will reprint articles from AGU publications on historical aspects of theh geophysical sciences, the structure and functioning of the geophysical sciences, historical geophysical data and their analysis, and biographies of geophysicists and celebrations. For information write to American Geophysical Union, 2000 Florida Avenue, NW, Washington, DC 20009.

History of Modern Physics, 1800-1950

An agreement has been reached for AIP to become a co-publisher with Tomash Publishers of this series, edited by Gerald Holton and Katherine Sopka (see HPN 1: 5, 25, 103). Forthcoming publications planned in this series include a history of the MIT Radiation Lab by Henry Guerlac and a collection of physics papers from the 1904 St. Louis Congress.

Philosophical Paperbacks

The Philosophical Library has launched a series of paperback reprints of "important works by a number of the greatest thinkers of all time." Books published so far include Radioactive Substances by Marie Curie, Essays in Humanism by Albert Einstein, the Diary and Observations of Thomas Alva Edison, and Science and Philosophy by Alfred North Whitehead. A reissue of Einstein's Essays in Physics is scheduled for February 1985. For information write to Melanie R. Fishman, Publicity Director, Philosophical Library, Inc., 200 West 57th Street, New York, NY 10019.

GRADUATE PROGRAMS & RESEARCH CENTERS

Editor's Note: We will publish in this section announcements of programs that have an emphasis and/or special resources in the history of physics. A complete list of programs may be found in "A Guide to Graduate Study and Research in the History of Science, Technology, and Medicine," pp. 19-70 in Guide to the History of Science published by the History of Science Society. (This book also contains the HSS Membership Directory, a Guide to Scholarly Journals and Societies, list of booksellers, etc.) Copies may be ordered for $10 each postpaid from the Isis Publication Office, University of Pennsylvania, 215 South 34th Street/D6, Philadelphia, PA 19104.

Other research centers are mentioned on page 19 under "Grants and Fellowships."

Chicago

The Morris Fishbein Center for the Study of the History of Science and Medicine at the University of Chicago is affiliated with the Department of History's graduate program in the history of science and medicine and maintains close cooperative relations with the Committee on the Conceptual Foundations of Science. Areas of faculty research and teaching include Astronomy (**Noel M. Swerdlow**), Greek Mathematics (**Ian Mueller**), Ancient to Modern Physics (**Howard Stein**), Ancient to Early Modern Physics and Mathematics (**Noel M. Swerdlow**), Physics and Philosophy in the Scientific Revolution (**Daniel Garber**), Relativity and Quantum Mechanics (**David Malament**), Philosophy of Physics (**Stephen E. Toulmin**), Mathematics and Statistics in the 19th and 20th Centuries (**Felix Browder, Saunders MacLane, Stephen M. Stigler**).

The Fishbein Center offers fellowships and stipends to supplement financial aid available through the several departments and commitees in which students may be enrolled. To encourage the research of visiting scholars, the Center offers upon occasion honorary postdoctoral fellowships, which in some instances may be supplemented by a small stipend.

The Regenstein Library at the University of Chicago has substantial holdings in the history of physics such as original documentation relating to the discovery and impact of nuclear fission, including the papers of Enrico Fermi. The recently acquired holdings of the John Crerar Library, which include rich collections in the history of science and technology, are housed in a new science library opened in the fall of 1984. The Newberry Library in downtown Chicago has related scientific resources, particularly for the Early Modern period.

Information about the graduate program may be obtained from Allen Debus, Department of History, University of Chicago, 1126 E. 59th Street, Chicago, IL 60637. Questions about the Fishbein Center itself may be directed to George W. Stocking, Jr., Director of the Morris Fishbein Center for the Study of the History of Science and Medicine (same address).

BOOKSELLER

Zeitlin & Ver Brugge has published its Catalogue no. 2766 (Summer, 1984) describing 261 books on "Natural Philosophy comprising major works in the fields of Physics, Mathematics, Astronomy and related sciences." Among the highlights of the collection are a copy of Galileo's Dialogue on the Two Systems of the World bound for Sir Richard Browne and John Evelyn, and the "second tallest copy" of Copernicus' De Revolutionibus. Write to Zeitlin & Ver Brugge, Booksellers, 815 North La Cienega Blvd., P. O. Box 69600, Los Angeles, CA 90069-0600.

REPORTS

Institute of Physics - History Group

[Last year the Institute of Physics, the British counterpart of AIP, established a History of Physics Group. A draft constitution is being studied and will be put before members in due course. There are now 54 members in the group. The October 1984 issue of Physics Bulletin contains a news release concerning the group and an article by John Roche, "History as Surgery," which outlines some of the contributions which history can make to modern physics. A meeting on "Experimenters and Instruments" will be held on 20 February 1985 in London (see under "Conferences" in this issue of HPN). The following report was prepared by **John Roche** of Linacre College, Oxford, who is Secretary to the Steering Committee of the Group.]

1. The background. Discussions have been under way among interested members of the Institute of Physics since late 1982 concerning the possibility of setting up a history of physics group within the Institute. Various enquiries and contacts were made with a view to testing reactions and gathering information. This led up to a preliminary meeting which was held at the Royal Institution on 1st February 1984.

A steering commitee was set up following the meeting consisting of: **A. J. Meadows** (Chairman), **J. Roche** (Secretary), **M. Ebison, B. Gee, D. Hooper, N. Kurti, G. S. Leadstone**, and **Mrs. R. Williamson.** The first meeting of that committee was held on 16 March 1984 at Linacre College, Oxford. It was decided to press ahead with recruitment, and the planning of activities, and also to approach Council for recognition. Council has now approved the group.

2. The aims of the group. The main aims of the group are to secure the written, oral and instrumental record of British physics for posterity, to foster a greater awareness concerning the history of physics among physicists, and to explore ways in which history can be used to make the teaching and general communication of physics more attractive. Since the history of physics deals with all aspects of physics the group also hopes to provide a forum through which the different and sometimes fragmented discipline of physics may interact fruitfully. The intention of the group is not to divert physicists away from physics into history but to encourage a fertile interaction between both pursuits within the physics profession itself. It is also hoped that the activities of the group will attract new members into the Institute and involve present members more closely in the activities of the Institute.

3. Areas of Research. The group proposes to pursue those aspects of the history of physics which especially require the skills of the physicist and which are of particular interest to professional physicists. There is no intention of encroaching on or of duplicating the activities of professional historians of science, but rather of coperating with and of complementing their researches. It was generally felt that 19th and 20th century physics would be of greatest interest to members of the Institute. Four major areas of interest have been identified: (1) oral history and archives; (2) the history of experimentation; (3) the history of physics ideas; (4) the history of the interactions between physics and society.

Particular interests expressed by various members of the group include: the recording of carefully prepared interviews with senior British physicists; supplementing printed accounts of experimental and instrumental research with oral history; the alerting of physicists to the possible historical importance of old research apparatus; the study of the interaction between instrument-makers and the practitioners of physics; the study of the laboratory note-book tradition; the role of the history of physics in physics teaching; the study of the possible publication of material from the archives of distinguished British physicists of the 19th and 20th centuries; the attempt to clarify redundant technical terms and obscure concepts by tracking down their origins in the foundational literature of physics; the possible re-publication of some of the classical texts of the past, such as Helmholtz's paper on the conservation of energy, with sufficient annotations to make them intelligible and useful to modern physicists. Such an enterprise could also be useful in physics teaching. It is based on the view that the canonical literature of physics, rightly understood, can still be nourishing to modern physics. There have been many other interesting research proposals.

4. Planned activities.

a. The chairman and several members of the steering committee, in cooperation with various other history of science groups, are at present engaged in drawing up a programme of oral history research.

b. If the group is approved by the Institute it is proposed to hold a one-day meeting in December or January [now scheduled for 20 February 1985] entitled "Experimenters and Instruments; the interaction between experimental skills and instrumental craftsmanship." Such meetings will form an integral part of the activities of the group and it is expected that they will develop and expand as the group learns to attune its choice of subject matter to the interests of members of the Institute.

c. The group intends to organise occasional summer schools for those of its members who wish to improve their knowledge of resources and techniques in the history of physics.

d. The group intends to assist those research activities of its members concerning the history of physics which are already under way and to provide advice and encouragement for those wishing to undertake such projects. Advice will also be given on the most opportune manner in which to publish research work. Some 10 members of the group so far are professional historians of science, as well as physicists, and the contacts thereby assured with the professional history of science and with science museums will guarantee the kind of leavening from the professional history of science which is generally felt to be important for the group.

e. Through contacts already established with museums, archives and libraries the group proposes to arrange exhibitions from time to time of apparatus and publications that are relevant to the history of physics. Professor Margaret Gowing and Mrs. J. Alton of the Oxford Contemporary Scientific Archives Centre have shown considerable interest in the group. Physicists at the London and Oxford science museums, in the Royal Institution and in various other bodies here and in America have also offered to support the activities of the group.

f. It is expected that the experience gained by the group will suggest various further activities.

5. Recruitment. The number of those wishing to join the group is growing steadily. It is hoped, through personal recruitment and through an article in the Bulletin to bring about a further significant increase in the number of members. If you wish to join the group or to offer suggestions, please write to: (Dr.) J. J. Roche, Secretary to the Steering Committee, Linacre College, Oxford, OX1 3JA.

Faraday

[The following is a report on "Faraday Rediscovered: A symposium organized by the Royal Institution Centre for the History of Science and Technology, 19-21 September 1984" by **Mari Williams**, Business History Unit, London School of Economics.]

As pointed out by the Director of the Royal Institution, Sir **George Porter**, in his opening remarks, this was the first conference devoted to the life and work of Michael Faraday for over 50 years; and where more appropriate to hold it than at the Royal Institution, where Faraday spent almost all his creative life? The symposium was the third organised by RICHST and maintained the high standards of the previous meetings. Over 50 scholars gathered to hear papers which covered topics ranging from Faraday's Sandemanian faith to his relations with several of his eminent colleagues, his life at the R. I., his contact whith the art world and the many sides of his scientific interests.

Following Sir George's introduction to the RI and his brief account of its history before Faraday's arrival, the scene was set for Faraday's life of outstanding scientific achievement. In turn the audience were told of Faraday's relations with Davy, his Dissenting background and the institutional context of his life and work. **David Knight** convincingly portrayed the sometimes tense relationship between Faraday and his mentor Davy as that of a son responding to an overbearing father. Their initial contact had come from Faraday's search for a patron and Davy's recognition of young talent, but the relationship which developed was complicated by rival claims over work on electromagnetism, by Davy's role as President of the Royal Society and obvious differences in temperament. The best comparison, it was suggested, was a Biblical one: Faraday's attitude to Davy was like that of David to Saul.

Faraday's religious background came under scrutiny next as his Sandemanianism was shown by **Geofrey Cantor** to be the key to Faraday's character. Through a discussion of Faraday's reading, of the Bible and subsequently of nature, his science and religion emerged as parallel entities rather than anything related causally. Sandemanians were people of the book, often connected with such activities as publishing or Librarianship (Faraday was originally apprenticed as a book-binder). Their faith was based on a particular reading of the Bible, which was to be interpreted as literally as possible as a plain, clear text. Similarly, Faraday's starting point in scientific investigation was that nature - governed by God - could be read, its evidence was always true and a knowledge of it would come first from observation. Hence the primacy of observation and experiment in Faraday's work, a point which was to dominate much of the rest of the meeting.

As opposed to Faraday's spiritual background, **Sophie Forgan** analysed his life in terms of the resources available to him, how he had to divide his time and his managerial duties. Apart from giving us rich detail on how Faraday must have had to organise his life - rushing between domestic administration, the organisation of lectures of all types, his work as Government consultant, and his consultancy work in general - Dr. Forgan pointed to a boundary which might help us to understand the complexity of Faraday's existence: the distinction between his public life epitomised by his performance in the famous RI lecture theatre, and his essentially ordinary private life taking place in regions above and below the working Institution. The very proximity of these spheres of his life meant they could never be separated and as he aged the overlap grew; Faraday's main reaction was to withdraw from social engagement outside the RI.

On the first evening some of Faraday's public activities were re-enacted in the lecture theatre by Professor **Ronald King**. This was the participants' first chance to appreciate what was to become a striking feature of the meeting: the use of experimental demonstration. On this occasion several experiments originally performed by Faraday (or his contemporaries) on his way to the discovery of electromagnetic induction were repeated, to the delight of the audience. A combination of Faraday's own equipment and some modern replacements allowed us special insight into how experiments were carried out and also lead to some speculation as to why Faraday might have chosen the particular trials he did.

The following day brought many more visual demonstrations with revealing results. In the morning the Institute of Electrical Engineers played host to the conference and proceedings started with **Brian Bowers** exploring interactions between Wheatstone, Faraday and electrical engineering and showing Wheatstone to be the link between Faraday's theory and its final large scale practical application. The story was not, of course, as simple as that: a network of individuals sharing a common interest in electrical phenomena and, in the case of Faraday and Wheatstone, in acoustics, was involved. Particularly revealing were Dr. Bowers' demonstrations (ably assisted by his son **Keith**) of the thermo-electric experiments carried out by the Americans Henry and Bach who were in London: the sparks produced, about which all original witnesses were so enthusiastic, proved difficult if not impossible to see, suggesting further questions about the authentication of experimental evidence.

Following this the anticipation of some that History of Science meetings might soon be organised to discuss the 21st century came close to realisation as we were shown a film of the power station of the future. The connection between Faraday and Westinghouse was explained at the outset by the presenter, **William Jackson**, but the main interest of the film was that it gave us a welcome glimpse into how big science operates, in this case in the Soviet Union, where research into magnetohydrodynamics (once also undertaken to a larger extent in the West) is being applied to problems of increasing the efficiency of power stations.

In the final session at the I.E.E. another of Faraday's contemporaries, Sturgeon, was brought under the spotlight. With some courage, given the Faraday-championing thus far, **Joe Marsh** presented the case for Sturgeon and the discovery of electromagnetic induction. The poor ex-gunner and instrument maker not only discovered the phenomenon before Faraday, his discovery was no lucky chance: he was quite capable of such a discovery. His studies of electrical phenomena from 1830 onwards were detailed including the important question of the publication of Sturgeon's early papers submitted to the RI's new journal 6 months before the article finally appeared - in the Philosophical Magazine - after being returned twice to the author for correction. It remains to be established how much the paper may have influenced Faraday, but Dr. Marsh's case was well argued and even dealt with the historiographical question of why Sturgeon's claims had been overlooked. The audience however remained unconvinced with the Faraday fan club, led by Professor **Pearce Williams**, awarding Sturgeon no more than a "maybe."

The afternoon session brought Faraday himself back into focus with **David Gooding**'s excellent analysis of Faraday as an experimenter and demonstrator. Addressing the question "What is it that Faraday was so good at?" he divided Faraday's experimental work into the private domain of laboratory activity, in which Faraday's' great skill was to discriminate between artefacts of the equipment and real effects; and Faraday's second great gift: making phenomena self-evident to an audience. The paper then covered (again with demonstrations) how the transition was made from one domain to the other, despite the historian's lack of access to certain forms of information - about underlying activity, objects and artefacts or tacit knowledge. The image which emerged was of Faraday's particular attitude to the frailty of theory, of his painstaking attention to experimental detail, of endless repetition to perfect potential public demonstrations, and of Faraday seeking his colleagues' reactions by sending them copies of his apparatus rather than trusting to the written word.

Faraday's commitment to experimental demonstration was also highlighted in the next paper by Professor **L. Pearce Williams** who spoke about "Faraday and Ampère: A critical dialogue." In a witty and clearly-delivered lecture Professor Williams exposed the crucial differences between Faraday and Ampère, giant of French mathematical science, and used these differences to explain the public dialogue in which both became involved. Essentially Faraday could not accept Ampère's seemingly cavalier attitude to his four theories of electricity and magnetism for which there was no possible mechanical demonstration. After reading Ampère Faraday turned to experiment for verification, something Ampère himself, as an abysmal experimenter, had not done. He did, however, respond to Faraday's criticism and was deeply affected by certain of Faraday's' discoveries. The Frenchman did get to the law of electromagnetic induction, but could not live with its implications for his original four theories. In this realisation Faraday had been decisive.

The second evening brought us another opportunity to appreciate the facilities at the RI, when Sir **George Porter** gave an hour-long series of demonstrations of Faraday as a chemist. Broadly following Faraday's career Sir George moved from investigations of organic chemistry, alloy steels and the liquefaction of gases, through electrochemistry and electrical properties of matter to magnochemistry and magnetic properties of matter. Ably assisted throughout by **Bill Coates** the display ended with spectacular demonstrations of the paramagnetic properties of oxygen and nitrogen.

On the final day of the programme, we started with another overseas visitor when Professor **Ryan Tweney** spoke of how Faraday made his famous discovery of induction. In a detailed account of Faraday's scientific activity from his early interest in electrical phenomena right through to his clear demonstration of electromagnetic induction, we were given a step-by-step breakdown of the series through which Faraday worked, how he chose each move (though not always why) and what each meant to the overall image he was developing of the new curiosity.

Having spent two days hearing of Faraday's great ability as an experimentalist and his clarity as a teaching, the next paper was something of a jolt as **Elspeth Crawford** exposed some of the great difficulties of studying Faraday. In particular she felt that the obscurities in Faraday - apparent to many commentators -- must not be explained away with excuses such as Faraday's ill health or bad memory. With close attention to the historical record and distinguishing between two kinds of thinking in Faraday - making use of experience and, more importantly here, learning from experience - an analysis of Faraday's idea of lateral forces was successfully presented. But perhaps the most important message from this very personal account came from Faraday himself: the need for humility in seeking the truth of anything and to face up to the possibility of never knowing.

The next perspective on Faraday's thought came from **Nancy Nersessian** who gave a philosopher's view of Faraday's field concept. Three questions were posed: What was Faraday's concept of a field? What is a field concept? What is a concept? With these in mind the work of a number of Faraday scholars was described leading to the conclusion that the second and third questions had hardly been tackled and thus that answers to the first were bound to be inadequate. Dr. Nersessian's own contribution was to introduce historians of science to the philosophical idea of the probabilistic view of a concept, which allowed flexibility; a concept is seen as something which changes with time rather than being absolutely fixed. It was this which provoked most discussion after the paper as a number of the scholars referred to entered the debate.

Debate was the order of the day at the beginning of the afternoon following **Frank James's** paper considering "Light and matter in Faraday's natural philosophy." The argument - between Dr. James and Professor Williams - centred on the relevance of Boscovich's theory of matter to Faraday's own theories. The speaker pointed out that Faraday had come to a consideration of light relatively late in his career and that for him this was an unprecedented move into the territory of the mathematical physicists. Again Faraday was portrayed as justifying himself experimentally: he could not accept attributes of the ether not borne out by experiment. He did not reject the ether permanently, only as long as it was incompatible with his experimental results. Furthermore, his approach to the whole problem was explicable in terms of his immersion in 19th century science and there was no need to invoke Boscovich and his point atoms to explain Faraday's work. Professor Williams was quick to defend himself pointing out that if something looked and behaved like a mallard duck, why not call it such? It this point it seemed that it might be time to disband...

Before that however we were treated to yet another and most welcome interpretation of Faraday, from an art historian. **Trudy Prescott** described "Faraday: The image of the man and the portrait collection." With the help of many carefully selected slides, Faraday the collector and Faraday the associate of many Victorian artists and photographers were presented. In contrast to the many biographers of Faraday who have all largely ignored Faraday's interests and contacts outside the world of science the speaker showed that Faraday was an informed collector of photographic portraits, that he was a willing subject for photographers, that he sought advice on photography and pigment from experts in addition to the more obvious interest he displayed in the chemistry and physics of photography and painting. He was a collector of taste with family and social links with the art world, continuing his attendance at the Royal Academy even after most other of his social engagements were abandoned.

As a final word on the conference, Dr. **Frank Greenaway** brought proceedings to a close with a re-emphasis on how much had been learned during the 3 days. Perhaps the most telling lesson (apart from the sheer amount of new information about Faraday) was that of the potential of actual demonstration at historical meetings: "Faraday rediscovered" will certainly be remembered for the experimental back up given to so many of the contributions.

British Astronomy and Geophysics

A Discussion Meeting on "The History of British Astronomy and Geophysics" was held under the auspices of the Royal Astronomical Society in London, 9 December 1983. In introducing the topic of the Meeting, **A. J. Meadows** explained that it represented the first activity of an informal group within the RAS, whose purpose was to bring together Fellows with an interest in the history of their subject and to encourage historical studies. As an initial step in the exploration of this interest, the present meeting was intended to bring together astronomers and geophysicists to discuss advances in these subjects attributable to British scientists.

The first speaker, **D. R. Barraclough**, described British determinations of the position of the South Magnetic Pole. Next, **A. A. Mills** talked about Newton's telescope. **G. A. Wilkins**, in a paper which had been prepared jointly with Miss **J. Dudley**, outlined the contribution that the Royal Greenwich Observatory had made to geodesy and geophysics during its history. The following speaker, **F. R. Stephenson**, also mentioned the contributions of the Royal Greenwich Observatory, in this instance to studies of the lunar and terrestrial accelerations. **D. G. King-Hele** discused the contributions of Erasmus Darwin to geophysics and astronomy. The last speaker in the morning session was **P. A. Moore**, who talked about pioneer British lunar observers.

H. A. Brück then spoke about Charles Piazzi Smyth's early astronomical work, and **D. J. Schove** talked about British contributions to studies of the sunspot and auroral cycles. **D. W. Hughes** returned the discussion to the 17th century with an examination of Halley's interest in comets.

[The above summary is based on a report published in The Observatory, August 1984, 104: 181-86, sent by A. J. Meadows.]

Storia della Fisica

The 5th Congresso Nazionale di Storia della Fisica was held in Rome, 29 October-1 November 1984, at the Dipartimento di Fisica, Università di Roma. The following papers were presented:

"Particelle: il problema storigrafico del nome e del resoconto" - **Enrico Bellone** (Genova)

"Contesto della scoperta e contesto della convalida. Tre casi esemplari: von Neumann, Wiener e Turing" - **Marcello Cini** (Roma)

"Forze, flussi, grandezze e dimensioni: la geometrizzazione della fisica nel Treatise di Maxwell" - **Salvo d'Agostino** (Roma)

"Le antinomie della fisica matematica dell'Ottocento" - **Giulio Giorello** (Milano)

"How it means: Mathematical modelling in physical theories" - **Ivor Grattan-Guinness** (Middlesex Polytechnic)

"Development of Mathematical and Theoretical Physics in the 19th and 20th Century" - **Armin Hermann** (Stuttgart)

"Model versus Mathematics? The case of Fresnel's development of the wave theory of light" - **John Worrall** (London School of Economics)

"La Storia della fisica in Italia" - **Silvio Bergia** (Bologna)

"Research in the United States on the History of Twentieth Century Physics" - **Spencer Weart** (AIP-CHP)

"La fisica italiana del Novecento e il problema dei fondi archivistici" - **Michelangelo de Maria** (Roma)

"Preserving documentary materials for the History of Twentieth Century Physics" - **Joan N. Warnow** (AIP-CHP)

For information about the congress write to Sig.ra M. T. Maria, Dipartimento di Fisica, Università di Roma "La Sapienza," P. le Aldo Moro, 2, 00185 Roma, Italy.

Theories of the Earth

"The Enlightenment and Earth History: A Symposium on Eighteenth-Century Theories of the Earth" was sponsored by the Linda Hall Library at Kansas City, Missouri, 12-13 October 1984. A special exhibit of rare books from the Library's History of Science Collection on "Theories of the Earth, 1644-1830: The History of a Genre" was held in conjunction with the symposium. The following papers were presented:

"The role of theories of the Earth in Western Thought" - **Jacques Roger** (Paris)

"Fontenelle interprets the Earth's history" - **Rhoda Rappaport** (Vassar)

"Peter Simon Pallas and his Theory of the Earth" - **Cecil J. Schneer** (New Hampshire)

"The Genesis - and Exodus - of Leibniz's Protogaea" - **William B. Ashworth** (Missouri-Kansas City)

"Rash hypotheses and the operation of nature: Desmarest's views on theories of the Earth" - **Kenneth L. Taylor** (Oklahoma)

"God's order and Nature's record: Elie Bertrand's 1766 Comentary on Theories of the Earth" - **Kennard B. Bork** (Denison)

For further information write to Linda Hall Library, 5109 Cherry Street, Kansas City, MO 64110.

Geophysics

Three history papers were presented at the Fall Meeting of the American Geophysical Union in San Francisco, December 1984: "Neil Mather Brice" by **C. F. Kennel** (UCLA); "ALfred J. Zmuda, 1921-1974" by **T. A. Potemra** (Johns Hopkins APL); "In defense of self-reversal" by **J. Verhoogen** (UC Berkeley). Summaries and complete authors' addresses may be found in the Newsletter of the AGU Committee on the History of Geophysics, Nov. 1984, pp. 10-11.

Technology

The Society for the History of Technology met at Cambridge, MA, 1-4 November 1984. Authors' abstracts of some of the papers appear in History of Science in America: News and Views, Nov./Dec. 1984, vol. III, no. 2, pp. 8-9, including "The Physicist's new clothes: The Atom in Postwar American Culture" by **Michael Smith.**

History of Science Society

A list of papers related to history of physics presented at the HSS Annual Meeting in Chicago, 27-30 December 1984, may be found in HPN 2: 4-5. Authors' abstracts of some of the papers on American Science are published in History of Science in America: News and Views, Nov./Dec. 1984, pp. 10-13, including "Semiconductor Research at Purdue University, 1943-1945..." by **Paul Henriksen**, "...The first superconducting particle accelerator at Fermilab.." by **Lillian Hoddeson**, "...The U.S. Atomic Energy Commission in the Eisenhower Administration" by **Jack M. Holl**; "NASA, Prestige, and total cold war..." by **Walter A. McDougall**, "World War II and American Solid State Physics" by **Kris Szymborski**, "The Physical Sciences at the University of Chicago: 1892-1940" by **Paul Theerman** and "The Solid Community, 1930-1960" by **Spencer Weart.**

4S

The 9th Annual Meeting of the Society for Social Studies of Science ("4S") was held in conjunction with the George Sarton Centennial Celebration at the University of Ghent, Belgium, 14-17 November 1984. Among the paperts presented were the following:

"The translation from Naive to Expert Physics" - **Andrea Di Sessa**
"Towards an analysis of scientific observation: The externality and evidential significance of observational reports in physics" - **Trevor Pinch**
"History of Science as a Laboratory for Cognitive Science" - **Arthur I. Miller**
"Electricity in the Seventeenth and early Eighteenth Centuries: Alchemy in Atomism" - **Gad Freudenthal**
"Gender in the Laboratory: Men and Women in High Energy Physics" - **Sharon Traweek**
"The scientific imagination and the new humanism: the educational and historical contributions of Gerald Holton" - **Jean-Francais Roberts**

A volume of extended abstracts of the presentations will be published.

For information about 4S contact J. Scott Long, Department of Sociology, Washington State University, Pullman, WA 99164.

Boston Colloquium

The program of the Boston Colloquium for the Philosophy of Science, 1984-85, includes the following sessions:

"Epistemological Opportunism and the Rise of Quantum Mechanics, 1925-1927" - **Mara Beller** (Hebrew University, Jerusalem); commentator, **David Cassidy** (Einstein Papers, Boston University) (25 September)

"Physics and Philosophy: Action at a Distance in 20th Century Physics" - **Jose M. Sanchez-Ron** (Madrid); commentator, **Jon Jarrett** (Vermont and Harvard) (13 November)

Symposium: History and Philosophy of Science in the U.S.S.R. today, including "History and Philosophy of Physics" - **S. R. Mikulinsky** (Moscow) and **M. D. Akhundov** (Moscow) (15-16 March)

Protophysics: A Symposium in Honor of Paul Lorenzen, including "Foundation of Geometry" - **Paul Lorenzen** (Erlangen); "Chronometry and Kinematics" - **Peter Janich** (Marburg); "Classical Rational Mechanics" - **Christian Thiel** (Erlangen); "Gravitation and Electromagnetism" - **Klaus Mainzer** (Konstanz); "Special Theory of Relativity" - **Holm Tetens** (Marburg); "General Theory of Relativity" - **Rüdiger Inhetveen** (Erlangen); commentators, **Jürgen Ehlers** (Munich), **Peter Mittelstaedt** (Cologne), **Joachim Pfarr** (Cologne); **Friedrich Rapp** (Berlin); **Paul Sagal** (New Mexico State); **Abner Shimony** (Boston University); **John Stachel** (Boston University); **Judson Webb** (Boston University); **Hans Zucker** (Belmont, MA) (18-19 April)

25th Anniversary of the Boston Colloquium for the Philosophy of Science - "Twenty-Five Years Later: What are the New Problems in the Physical and Social Sciences" - **Kenneth Brecher, Robert S. Cohen, Yehuda Elkana, Edward McKinnon, Ernan McMullin, Ruth Barcan Marcus, György Markus, Everett Mendelsohn, Philip Morrison, Hilary Putnam, Norman Rudich, Israel Scheffler, S. S. Schweber, Abner Shimony, John Stachel, Lazlo Tisza, Kurt Wolff, Hans Zucker.** (7 May)

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

Rowland's Grating

The 100th Anniversity of Henry Rowland's introduction of the concave diffraction grating was celebrated at the Johns Hopkins University, 14 June 1984, with a symposium including papers by **Debby Warner, Bob Kargon, John Strong, Lyman Spitzer, Horace Babcock, Dick Tousey, Gerhard Herzberg, and Erwin Loewen.** The meeting was sponsored by the Hopkins Department of Physics & Astronomy and NASA.

JOURNALS AND SOCIETIES

(Supplement to the lists given in HPN 1: 47-48, 53, 2: 9)

AGU Committee on the History of Geophysics Newsletter

Published approximately twice a year (starting in November 1982); edited by Sam M. Silverman, Department of Physics, Boston College, Chestnut Hill, MA 02167. Includes announcements, meeting reports, reviews, articles, and summaries of publications relating to the history of geophysics.

Archives internationales d'histoire des sciences

From January 1985, the editor will be Prof. Robert Halleux, Universite de Liège, Place du XX-Aout, 32; B-4000 Liège, Belgium.

Eos

C. Stewart Gillmor is Editor for History of Eos, the Transactions of the American Geophysical Union which now goes to over 17,000 AGU members. He invites manuscripts concerning the history of the geosciences and areas of science studies of interest to AGU members, up to about 25 double-spaced typewritten pages and in certain cases up to 45 pages in length, including illustrations. An AGU style guide for contributors to Eos and a further description of criteria for Eos history manuscripts may be obtained by writing the Eos managing editor, Barbara Richman, at AGU, 2000 Florida Avenue, NW, Washington, DC 20009. Historical or Science Studies articles in Eos will be republished the following year in a new hard-cover edition of historical articles collected from all of the AGU journals [see item under "Book Series" in this issue of HPN].

European Association for the Study of Science and Technology

EASST was founded in 1981. It publishes a quarterly newsletter, organizes an annual general conference, and sponsors small workshops. Contact Dr. Arie Rip, EASST Secretary, Chemistry and Society Programme, University of Leiden, P. O. Box 9502, 2300RA Leiden, Netherlands.

History of Science in America, News & Views

Edited by Clark A. Elliott, University Archives, Pusey Library, Harvard University, Cambridge, MA 02138. Published twice yearly. All material submitted for publication should be typed camera-ready in columns not exceeding 3.25 inches, single-spaced; longer pieces should not be more than 4 columns; all items should include author's name and institutional affiliation. Subscriptions $5; checks should be made payable and sent to the editor.

QUERY

Meitner

For a biography of the physicist Lise Meitner (1878-1968), I would appreciate hearing from anyone who has letters, anecdotes, photographs, reminiscences, documentary material or other information.
-- Marvin J. Richman, 3238 Fond Drive, Encino, CA 91436.

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.

NEWTON MANUSCRIPT

WATANABE, M.; I. TANAKA. A Newton manuscript in Japan, Annals of Science, 1984, 41: 159-164.

Undated theological manuscript which "gives an insight into Newton's historical and philological analyses and interpretations of such terms as 'hypostasis' 'substantia', and 'persona'...".

Author's address: Watanabe: Faculty of Humanities, Niigata University, Ikarashi, Niigata-shi 950-21, Japan.

COPERNICAN ARGUMENT

HILL, D.K. The Projection Argument in Galileo and Copernicus: Rhetorical Strategy in the Defence of the New System. Annals of Science, 1984, 41: 109-133.

The anti-Copernican argument that the diurnal rotation of the earth would have catastrophic centrifugal effects on terrestrial objects has a curious history. Copernicus, who falsely ascribes it to Ptolemy, seems to have introduced it in De Revolutionibus as a foil for his own arguments, to create a rhetorically favourable context of discussion. Galileo, who tried to deal with the complexities of the argument (as Copernicus had not), managed to produce a rejoinder perhaps unequalled in scientific literature, a reasonably complex geometrical argument with rhetorical appeal to the literate mass audience. It is also fallacious, as (I argue) Galileo very probably knew. Various specific points are made concerning Galileo's rhetorical strategy. I also explain why Galileo (unlike contemporary commentators with Newtonian biases) would not have thought his conclusion is open to single counterexample.

Author's address: Dept. of Philosophy, Augustana College, Rock Island, Illinois 61201, USA.

NEWTONIAN GRAVITY RESULTS

WEINSTOCK, R. Newton's Principia and the external gravitational field of a spherically symmetric mass distribution, American Journal of Physics, 1984, 52(10): 883-890.

A detailed analysis is offered - with concomitant clarification, correction, and celebration - of the treatment in Newton's Principia of the external gravitational field produced by a spherically symmetric mass distribution. It is established, in particular, just how close the Principia comes to achieving the most general result (whereby the sphere can be considered as concentrated at its center); it is also shown how the Principia argument could easily have been extended so as to have gone the whole way.

Author's address: Department of Physics, Oberlin College, Oberlin, Ohio 44074.

USE OF ANALOGIES

DASTON, L. Galilean Analogies: Imagination at the Bounds of Sense. Isis, 1984, 75: 302-310.

A study of Galileo's use of three types of analogy--expository, explanatory, and mathematical--in light of his Aristotelian wariness of the faculty of the imagination, and the blurred boundary between mathematics and physics in his work on the continuum.

Author's address: Program in History of Science, 220 Palmer Hall, Princeton University, Princeton, NJ 08544.

GALILEO

FISCHER, KLAUS. Galileo Galilei. Munich: C.H. Beck, 1983, 238pp., DM 19.80.

"... an admirable summary of the chief features of Galileo's thought, the best recent studies of his evolution as a scientist, and the different interpretations of the significant historiographical issues"--Wilbur Applebaum, review in American Historical Review, 1984, 89: 401-402.

EARLY LIGHT THEORY

NAKAJIMA, H. Two Kinds of Modification Theory of Light: Some New Observations on the Newton-Hooke Controversy of 1672 Concerning the Nature of Light. Annals of Science, 1984, 41: 261-278.

It has not been sufficiently emphasized that there existed two kinds of modification theory of colours, Aristotle's modification theory and Descartes-Hook's modification theory. This seems to have caused some confusion in the interpretation of the optical controversy between Newton and Hooke in 1672. The aim of the present paper is to prove that these two kinds of modification theory really coexisted, and on that basis to present a new interpretation of the optical controversy of 1672. The characteristics and the historical role of each of these theories will be described. Newton's colour theory was formed under the influence of Aristotle's modification theory, which had been disseminated through the work of an English Gassendist, Walter Charleton. Newton's optical theories were created not only under the influence of Descartes, as we have been often told, but also under the conspicuous influence of corpuscular philosophers.

Author's address: History and Philosophy of Science, University of Tokyo, Komaba Meguro-ku, Tokyo 153, Japan.

PHYSICS & CULTURE

LOTZE, BARBARA;DIETER P. LOTZE Alive throughout: Wilhelm Busch and physics. American Journal of Physics, 1984, 52(8): 692-695.

The works of the most popular German humorist, Wilhelm Busch (1832-1908), a favorite of physicists like Einstein and Born, contain various references to physical science. Selected passages from his books may be used to broaden the scope of physics instruction by incorporating a cultural component. On the other hand, they can serve to expose the humanities student to some basic concepts of physics.

Author's address: Allegheny College, Meadville, Penn. 16335.

FRIES & GEOMETRY

GREGORY, FREDRICK. Neo-Kantian Foundations of Geometry in the German Romantic Period. Historia Mathematica 10, 1983: 184-201.

While mathematics received little attention in the idealistic systems of most of the German Romantics, it served as the foundation in the thought of the Neo-Kantian philosopher/mathematician Jakob Friedrich Fries (1773-1843). It fell to Fries to work out in detail the implications of Kant's declaration that all mathematical knowledge was synthetic a priori. In the process Fries called for a new science of the philosophy of mathematics, which he worked out in greatest detail in his Mathematische Naturphilosophie of 1822. In this work he analyzed the foundation of geometry with an eye to clearing up the historical controversy over Euclid's theory of parallels. Contrary to what might be expected, Fries' Kantian perspective provoked rather than inhibited a reexamination of Euclid's axioms. Fries' attempt to make explicit through axioms what was being implicitly assumed by Euclid while at the same time wishing to eliminate unnecessary axioms belies the claim that there was no concern to improve Euclid prior to the discovery of non-Euclidean geometry. Fries' work therefore serves as an important historical example of the difficulties facing those who wanted to provide geometry with a logically secure foundation in the era prior to the published work of Gauss, Bolyai, and others.

Authors address: Department of History, University of Florida, Gainesville, Florida 32611

HALLEY'S COMET

WALLIS, R. The Glory of Gravity - Halley's Comet 1759, Annals of Science, 1984, 41: 279-286.

During the eighty years since the publication of the Principia, Newton's theories had been popularized. Based upon them, the first predicted return of any comet aroused anticipation and then elation. Contemporary accounts in widely-read periodicals show the interest in the vindication of gravitational theory provided by fulfillment of the prediction.

Author's address: Project for Historical Biobibliography, 27 Westfield Drive, Newcastle upon Tyne NE3 4XY, England.

THE BALLOON AND CHEMISTRY

SCOTT, ARTHUR F. The invention of the Balloon and the Birth of Modern Chemistry. Scientific American, 1984, 250(1): 126-137.

"The first manned balloon flights in France 200 years ago were inspired by basic research into the nature of gases by some of the leading chemical investigators of the day."

LIOUVILLE

LÜTZEN, JESPER. Joseph Liouville's work on the figures of equilibrium of a rotating mass of fluid. Archive for History of Exact Sciences, 1984, 30: 113-166.

After Jacobi's surprising discovery in 1834 that rotating triaxial ellipsoids of fluid could be in equilibrium, Joseph Liouville (1809-1882) began a study of the properties of these figures and of the well known equilibrium ellipsoids of revolution found by Maclaurin. He published six papers on the question, but only a small fraction of his most far-reaching investigations on the stability of the figures of equilibrium, made during the last months of 1842, appeared in print.

This paper contains an almost complete reconstruction of LIOUVILLE's theory of stability in its historical context. It is based on two manuscripts published here for the first time and on numerous calculations in LIOUVILLE's notebooks. LIOUVILLE's idea is to determine whether the "force vive" (the kinetic energy) of a perturbed equilibrium figure has a maximum in the equilibrium state. That he did by expanding the perturbations in a series of Lame functions.

INTERDISCIPLINARY COURSE

CALVERT, J.B.; E.R. TUTTLE; M.S. MARTIN; P. WARREN. The age of Newton: An intensive interdisciplinary course. History Teacher, 1981, 14: 167-90; reprinted from American Journal of Physics, 1976, 44: 231-35, and 1977, 45: 797-802.

Description of course offered at University of Denver.

Author's address: Calvert and Tuttle: Dept. of Physics, Univ. of Denver, Denver, CO 80208. Martin and Warren: Dept. of Math., Univ. of Denver, Denver, CO 80208.

BEFORE SOLID STATE

SMITH, C.S. The Pre-history of Solid State Physics. Presented at the Symposium of the Division of History of Physics, Detroit Michigan, 28 March 1984.

The present efflorescence of condensed matter physics marks a basic change from the analytical approach of the past few centuries. In some ways it is a return to the attitudes of the corpuscular philosophers of the seventeenth century, especially René Descartes and his followers whose qualitative models denied the divisibility of the atom but postulated a hierarchy of structural forms. Newtonian mathematical physics was totally unable to handle structure-sensitive properties and squelched structural speculation. Microscopy was slow to develope except in biology, but artists and craftsmen knew to relate the properties of materials to their composition and granular texture (visible structure). The corpuscles gradually became the quantitative units of the Daltonian molecule (always stoichiometric!). Even before that chemists, in clear precognition of today's electron and energy quanta had postulated phlogiston and caloric to account for the sensible properties of substances and their change by reaction and thermal treatment. With voltaic electricity the edge of discovery moved from the workshop to the laboratory -- and back to the shop again as electrical industry created materials having new properties instead of simply selecting the old. Metallurgist's early observations and ideas on slip, grain boundaries and other crystalline defects (perhaps "xenomorphs" is better term?) laid the ground for the more critical study by physicists commencing in the 1920's. The competition between organic and inorganic materials augurs well for the future of science. This paper is presently being prepared for publication.

Author address: 31 Madison Street Cambridge, Mass. 02138.

2ND LAW OF THERMO

KIM, YUNG SIK. Clausius's Endeavor to Generalize the Second law of Thermodynamics, 1850-1865. Archives internationales d'histoire des sciences, 1983, 33: 22-39.

After stating the basic idea of the second law of thermodynamics in 1850, Clausius (1822-1888) began a long struggle to put it into a more general form. But this effort contained many digressions, loopholes, and even some confusions. This paper tries to make sense of what Clausius did in this long endeavor. In particular, it draws an attention to Thomson's idea of "the universal tendency to the dissipation of energy" as a possible source of motivation.

Author's address: Yung Sik Kim, Department of Chemistry, Seoul National University, Seoul 151, KOREA.

MEANING IN SCIENCE

NERSESSIAN, N. Faraday to Einstein: Constructing Meaning in Scientific Theories. 215 pp. Hingam, MA: Kluwer, 1984, $38.00.

Contents:
Paper I. The Philosophical Situation: A Critical Appraisal. 1: The 'standard' account of meaning. 2: 'Meaning variance' and 'incommensurability.' Part II. The Scientific Situation: An Historical Analysis. 3: Faraday's 'lines of force.' 4: Maxwell's 'Newtonian aether-field.' 5: Lorentz' 'non-Newtonian aether-field.' 6: Einstein's 'field.' Part III. The Making of Meaning: A Proposal. 7: Meaning in scientific practice.

QUESTIONS ASTRONOMERS ASK

MEADOWS, J. The Origins of Astrophysics. American Scientist, 1984, 72: 269-274.

Following a revolutionary change in their discipline, modern astronomers ask questions about the universe totally different from those their predecessors asked in the 19th century.

Author's address: Department of Astronomy and History of Science, University of Leicester, University Road, Leicester LE1 7RH, England, UK.

PIERRE DUHEM

JAKI, S.L. Uneasy Genius. The Life and Work of Pierre Duhem. 480 pp. Hingham, MA: Kluwer, 1984, $65.50.

Contents:
1. Young Pierre. 2. The Normalien. 3. Lecturer in Lille. 4. In Transit in Rennes. 5. Bordeaux: A Road to Paris? 6. Bordeaux Journey's End. 7. In Memoriam. 8. Duhem the Physicist. 9. Duhem the Philosopher. 10. Duhem the Historian. List of Duhem's Publications.

ROWLAND

BELL, R.E. The truth about Rowland? Physics Today, February 1984, 37(2): 89.

Is there any truth in the story that Henry Rowland admitted in court to being the world's greatest authority (on electricity)? (See letter from S.R. Weart, ibid., April 1984, p. 109)

POISSON'S CONTRIBUTIONS

ARNOLD, DAVID H. The Mécanique Physique of Siméon Denis Poisson: The Evolution and Isolation in France of his Approach to Physical Theory (1800-1840). Archive for History of Exact Sciences, 1983, 28(3,4,5, & 6).

The career of the French mathematician and physicist, S.D. Poisson, spans the years from 1800-1840, an exciting period in the history of science. Entering the Ecole Polytechnique in Paris in 1798, Poisson quickly established himself as a gifted mathematician. His talent as an analyst attracted the attention of Laplace. Laplace's program for physics was than dominant in France, and the young Poisson soon became an enthusiastic supporter of many of his ideas. Poisson went on to publish over two hundred scientific papers as well as treatises on mechanics, capillarity, and heat. Though Poisson often tackled fashionable topics, his scientific contributions run deeper than isolated reactions to the ideas of others. An examination of the evolution of his conception of "physical mechanics" reveals a unified concern and an uneasiness pervading much of his thought. Doubt about the capability of contemporary mathematical analysis to describe physical phenomena shows itself in many of his memoirs. Some of these papers assume new significance when viewed as attempts to reexamine the extent to which the integral calculus of the continuum can be applied to describe physical phenomena which ultimately depend upon the discrete structure of matter.

Author's Address: Mathematics Department, Phillips Exeter Academy, Exeter, New Hampshire 03833

METATHEORIES OF SCIENCE

RADULET, R. "Metascientific Research in the Evolution of Physics," Science of Science, 1981, 2: 45-54.

After presenting the metatheories of sciences as their crowning achievements, the author considers that the metatheoretical approach to particular problems constitutes a stimulus to their development during the process of their constitution, and he illustrates this thesis with examples (significant in the evolution of physics) or research: univocal operative definitions of concepts, breakdown of theorems into several propositions in order to recognize the laws in each of them, suppression of incoherences in propositions, fusion of sciences with equal structures, and realization of deductive and logical completudes.

ELECTRIC FISH

WU, C.H. Electric fish and the discovery of animal electricity. American Scientist, 1984, 72: 598-607.

The mystery of the electric fish motivated research into electricity and was instrumental in the emergence of electrophysiology.

Author's address: Department of Pharmacology, Northwestern University, 303 E. Chicago Avenue, Chicago, IL 60611.

GOETHE'S MAGNETICS

KIEFER, K.H. Goethe und der Magnetismus. Grenzphanomene des naturwissenschaftlichen Verständnisses. Philosophia Naturalis, 1983, 20: 264-311.

What Goethe considered as electromagnetism is discussed on the basis of lexical studies as well as the analysis of historical investigation procedures. Even if the magnet was the epistemological kernel of the romantic paradigm in which Goethe and Schelling both participated his morphological view prevented him from becoming a Mesmerist and follower of animal magnetism, or from generalizing the analogical method up to metaphysical speculations as for instance Schubert, Oken and others.

Author's address: Sprach- und Literaturwissenschaftliche Fakultät Universität Bayreuth, priv. Arcisstr. 4a, 8000 München 40, Germany.

EINSTEIN LETTER

LIPKIN, DANIEL. Putting a rolling marble to rest. American Journal of Physics, 1981, 49: 619.

On the interpretation by J.A. Burns (ibid., p.56) of a letter from Einstein to Lipkin in 1944.

Author's address: 1717 Bantry Drive, Dresher, PA 19025.

COLLIN S OBITUARY

COLLINS, S.C. (Obituary). The Washington Post, June 21, 1984, p. C6.

Leader in cryogenics, invented machine to liquefy helium. Died June 18, 1984 at age 86.

GEOPHYSICS

GAMBURTSEV, G.A. Development of the Ideas of G.A. Gamburtsev in Geophysics (in Russian), Moscow: Nauka, 1982.

Collection of essays by former students and colleagues of Grigorii Aleksandrovich Gamburtsev, published in honor of his 80th birthday. Includes articles on seismology and its applications. Announced in Izvestiya Akadmii Nauk USSR, Earth Physics, 1982, 18(6): 479 (English translation).

THERMODYNAMICS

LANDSBERG, P.T. The Born Centenary: Remarks about classical thermodynamics. American Journal of Physics, 1983, 51: 842-845.

Max Born (1882-1970) advocated Carathéodory's approach to thermodynamics in 1921 and 1949, and it was expounded by various authors in the intervening years, but it did not come into general use. Some historical remarks are made concerning the discussions between Born and Carathéodory. Although the Carathéodory approach continues to be regarded as "difficult", it is here noted that his principle (as contrasted with what is called his theorem) is really straightforward in concept. It is here emphasized that there was a need to push Carathéodory's approach further since it did not cover the third law of thermodynamics, and that set theory and simple topological concepts provided the ideal tools to achieve this aim. This led to a more complete geometrization of thermodynamics. Although specialized and mathematical work on the axiomatization of thermodynamics continued in the 1960s and 1970s, there also emerged a reasonably simple way of combining elements of the geometrical approach and the approach via thermodynamic cycles, as it is here recalled. When Born died in 1970 this work was essentially complete.

Author's address: Faculty of Mathematical Studies, University of Southampton, Southampton, England.

20TH CENTURY PHYSICS

MILLER, ARTHUR I. Imagery in Scientific Thought: Creating 20th-Century Physics. xiv + 355 pp. Boston: Birkhäuser, 1984. $24.95.

What are the origins of scientific concepts? How are scientific concepts transformed as science progresses? What is the role of mental imagery in scientific research? How do scientists invent or discover theories? This book offers a fresh approach to these problems. First, the relation between creative scientific thinking and the construction of scientific concepts is explored through case studies in 19th and 20th century mathematics and physics. The case studies deal with Niels Bohr, Ludwig Boltzmann, Albert Einstein, Werner Heisenberg, and Henri Poincaré, and include the invention of special relativity and the genesis of quantum theory during 1913 through 1950. The results of these scenarios are used as data to be examined with contemporary cognitive psychological theories such as Jean Piaget's genetic epistemology, Gestalt psychology, and cognitive science. This method of investigation tests these theories' assertions about the construction of knowledge and creative thinking, thereby leading to reassessments of the role of mental imagery in scientific research, the dynamics of creative thinking, and the notion of scientific progress. Thus, history of science is used as a laboratory for cognitive studies.

FIRST COMPUTER

MACKINTOSH, A.R. Still more on first computer. Physics Today, 1984, 37(4): 11.

On J.V. Atanasoff.

EINSTEIN'S NAVY

BRUNAUER, STEPHEN. Einstein in the U.S. Navy. ACS Symposium Series. 1983, 222 (Heterogeneous Catalysis): 217-226.

A brief historic account of Albert Einstein's participation in high explosives research as a consultant to the U.S. Navy's Bureau of Ordnance during World War II is presented.

Author's address: Clarkson College, Potsdam, New York 13676

NOTE ON GYROSCOPE

EVERITT, C.W.F. Gyro omissions. Physics Today, August 1984, 37(8): 84.

The article on the relativity gyroscope experiment (May, page 20) should have mentioned the work of R.F. O'Connell, B.M. Barker and their colleagues.

MEYERSON ON EINSTEIN

MEYERSON, E. The Relativistic Deduction: Epistemological Implications of the Theory of Relativity with a Review by Albert Einstein. (Boston Studies in the Philosophy of Science 83) 290 pp. Boston: Reidel, 1984, $49.00.

Le déduction relativiste was first published in Paris in 1925. In a 1928 review, Einstein described the book as 'one of the most remarkable ever written on the theory of relativity from the standpoint of the theory of knowledge.' A translation of Einstein's review is included in this volume.

RELATIVITY FOOTNOTES

McCAUSLAND, I. Einstein and Special Relativity: Who wrote the added footnotes? British Journal for the Philosophy of Science, 1984, 35: 60-61.

Suggests that the notes to Einstein's paper in The Principle of Relativity by Lorentz et al. (1923) were written by Einstein rather than A. Sommerfeld.

Author's address: University of Toronto, Toronto, Ontario, Canada.

SUPERCONDUCTIVITY

GAVROGLU, K.; Y. GOUDAROULIS. Some Methodological and Historical Considerations in Low Temperature Physics: The Case of Superconductivity 1911-57. Annals of Science, 1984, 41: 135-149.

In this paper we study some methodological problems associated with the development of one of the major theories in low temperature physics, that of superconductivity. The first experimental results of 1911 were interpreted within a framework that hindered the paradoxical aspects of the new phenomenon. Various research programmes degenerated until new experimental results forced a reappraisal of the existing theoretical framework making possible a different formulation of the problem that had to be solved. This led to a progressive research programme, whose positive heuristic we also study.

Authors' address: Gavroglu: Physics Division, National Tech. University, Zografu Campus, Athens 624, Greece. Goudaroulis: Dept. of Mathematics and Physics, School of Technology, Aristotelian University of Thessaloniki, Thessaloniki, Greece.

HARVARD CENTENNIAL

FRIESINGER, GRETCHEN. Harvard physicists celebrate a century of teaching and researching in The Incomplete Science. Harvard Magazine, 1984, 86(4): 34-39.

Picture of 12 Harvard physicists with brief summaries of their work.

BOHR-PAULI

HENDRY, J. The Creation of Quantum Mechanics and the Bohr-Pauli Dialogue. (Studies in the History of Modern Science 14) 192 pp. Boston: Reidel, 1984, $34.50.

In this book, the development of quantum mechanics is interpreted as a dynamic interaction between physical, methodological and epistemological considerations, emerging primarily as a dialogue between two profound physicist-philosophers, Niels Bohr and Wolfgang Pauli. It is shown that Heisenberg's matrix mechanics, the quantum-mechanical transformation theory, Heisenberg's uncertainty principle and Bohr's principle of complementarity all had their roots in this central dialogue, and that the ideas characteristic of the interpretation of quantum mechanics were also essential to its creation.

HISTORICAL APPROACH

KAPLAN, NORMAN CHARLES. Teaching physics with history. Physics Today, 1983, 36(12): 91.

Sheldon Glashow, Steven Weinberg and Roy Glauber all use history in teaching physics.

THE COURT ON LASERS

PENZIAS, A.A. Laser patents. Science, 1982, 217: 1082.

"The San Francisco court did not decide that the Gould patent had precedence over the earlier Schawlow-Townes patent for the invention of the laser." With a response by Eliot Marshall.

EARLY MICROWAVES

BLEANEY, B. Microwave Spectroscopy in Oxford: The First Decade, Part 1: Microwave Gas Spectroscopy. Contemporary Physics, 1984, 25(4): 315-329.

A brief account is given of the main developments in microwave spectroscopy in Oxford in the years commencing 1945. The first experiments were made on the inversion spectrum of ammonia gas at pressures ranging from several atmospheres down to 10-5 atmospheres, to examine the effects of collision broadening on line shape. Rotational structure and saturation effects were observed at low pressures. A brief outline is given of later developments in the field, including the invention of the maser.

Author's address: The Clarendon Laboratory, Parks Road, Oxford OX1 3PU. England, UK.

SOCIOLOGY OF SCIENCE

BARNES, BARRY; DAVID EDGE. (ed.) Science in Context, Readings in the Sociology of Science, xii + 372 pp. Cambridge Mass.: MIT Press., 1982, $9.95. (Paperback)

Includes: W.O. Hagstrom "Gift giving as an organizing principle in science" 21-34; H.M. Collins, "The replication of experiments in physics" 94-116 (on grav. waves); A. Pickering "Interest and Analogies" 125-146 (high energy physics); M. Gibbons & C. Johnson "Science, technology and the development of the transistor" 177-85; B. Wynne, "National knowledge and social context: Cambridge physicists and the luminiferous ether" 212-231.

SHAPLEY

DeVORKIN, D.H., The Harvard summer school in astronomy. Physics Today, July 1984, 37(7): 48-55.

The annual conferences that Harlow Shapley organized from 1935 through 1942 fostered the growth of astrophysics in the U.S., and were the model that inspired similar sessions on other campuses.

Author's address: History of Astronomy, Space Science and Exploration Department, Smithsonian Inst., National Air and Space Museum, Washington, DC.

NORMS OF RESEARCH AUTONOMY

SUTTON, J.R. Organizational Autonomy and Professional Norms in Science: A Case Study of the Lawrence Livermore Laboratory. Social Studies of Science, 1984, 14: 197-224.

Functionalist theories in the sociology of science suggest that applied research organizations, insofar as they violate professional norms of research autonomy, professional recognition and open communication, also violate the epistemological and methodological requirements of successful research. The analysis presented here, based on interviews with scientists at a major US nuclear weapons laboratory (the Lawrence Livermore Laboratory), suggests that research norms and criteria of success are both situationally defined. Recent models of formal organizations are used to describe two levels at which professional norms are co-opted to achieve organizational research goals: the first level is the internal structure of the organization, and the second, environmental, level consists of professional and peer relations of Livermore scientists and the laboratory's relations to the state. The conclusions suggest some structural limitations of this alternative model of science.

Author's address: Dept. of Sociology, 2-N-2 Green Hall, Princeton University, Princeton, N.J. 08544.

SEMICONDUCTING OXIDES

SCHOPMAN, J. The Philips Contribution to theory and application of semiconducting oxides (1935-1950). Janus, 1983, 70: 129-145.

The N.V. Philips' Gloeilampenfabrieken at Eindhoven have contributed to research on the theory and applications of both spinel and controlled valency semiconducting oxide compounds. This research has made important (patent) applications feasible and has initiated products which are still being made today. Due to the isolation of the war period one can speak of a specific Philips' contribution.

Author's address: State University of Utrecht, Central Interfaculty Department of Philosophy, Heidelberglaan 2, Postbox 80.103, 3508 TC Utrecht.

NOBEL IN ASTROPHYSICS

LUBKIN, G.B. Nobel prize to Chandrasekhar and Fowler for astrophysics. Physics Today, 1984, 37(1): 17-20.

Subrahmanyan Chandrasekhar's description of the work for which he received the 1983 Nobel Prize in Physics, and a summary of William A. Fowler's research for which he received the Prize.

WORKS OF TRUESDELL

[TRUESDELL, C.] Books written or edited by C. Truesdell. New York: Springer-Verlag, 1984, 30pp.

Includes extracts from reviews of Truesdell's books on the history of mechanics and thermodynamics, and a 1944 photograph.

Distributed free by Springer-Verlag New York Inc., 175 Fifth Avenue, New York, NY 10010.

IN HONOR OF DRAPER

GLASSGOLD, A.E. ; P.J. HUGGINS; E.L. SCHUCKING (eds.) Symposium on the Orion Nebula to honor Henry Draper. xii + 338 pp. New York: New York Academy of Sciences, 1982. (Annals, vol. 395)

Includes: E.L. Schucking, "Henry Draper: The Unity of the Universe"; Owen Gingerich, "Henry Draper's Scientific Legacy"; Howard Plotkin, "Henry Draper, Edward C. Pickering, and the birth of American Astro-physics"; T.J. Herczeg & Anne Kinney, "The Collection of Henry Draper Memorabilia in the New York University Archives."

MUON ATOMS

KANGNIAN, YAN. The Discovery Process of Muon Atoms and Emergence of Strange Atom Physics. Journal of Dialectics of Nature, 1983, 5(5): 45-49.

Professor W.Y. Chang is a famous physicist of our country. He is now the director of High Energy Institute of the Chinese Academy of Sciences. When he was a research professor of physics in Princeton University in the 1940's, at the suggestion of the director of the Department of Physics, H. Smyth, and Professor J.A. Wheeler, he made a great number of experiments on the questions of mesons of the Cosmic rays by Al, Fe, Pb foils in the cloud chamber, and the muon discovered by him is one kind of weak interaction particle , and he also discovered the muon atoms. The author has studied a series of Professor W.Y. Chang's papers and related documents about these researches and interviewed him. Professor Chang explained the historical background and the process of his discovery.

THE NEUTRON

BROWN, Louis. Discovery of the Neutron. Physics Today, March 1984, 37(3): 135.

On the 1930 experiment of Walter Bothe and Heinrich Becker, alluded to but not named in John Laughlin's article "History of Medical Physics" (ibid., July). With a reply by Laughlin, pp. 135-126.

NUCLEAR FORCES

GREEN, A. A history of nuclear forces. Physics Today, August 1984, 37(8): 79-80.

On a 1949 manuscript on relativistic effects in nuclear forces, rejected for publication by Physical Review.

Author's address: University of Florida, Gainesville, Florida 32601.

LIFSHITZ' OBITUARY

ANDREEV, A.F. et. al. Il'ya Mikhailovich Lifshitz (Obituary). Soviet Physics Uspekhi, 1983, 26: 634-35 (translated from Usp. Fiz. Nauk, 1983, 140: 521-22).

Lifshitz, "one of the world's greatest theoretical physicists, at the forefront of research into solid-state theory in the Soviet Union, died on 23 October 1982 at the age of 65."

BLOCH'S OBITUARY

HOFSTADTER, ROBERT. Felix Bloch (Obituary). Physics Today, March 1984, 37(3): 115-116.

Bloch was born in Zurich on 23 October 1905 and died in Zurich on 10 September 1983. He shared the 1952 Nobel Prize in Physics for his discovery of nuclear induction. Extracts from an interview were published in HPN, March 1984, 1: 91-92.

EXPERIMENTAL REPETITION

FRANKLIN, A. Forging, cooking, trimming, and riding on the bandwagon. American Journal of Physics, 1984, 52: 786-93.

Four cases from 20th century physics (Rupp's experiments on electron scattering, Millikan's oil drop experiment, violation of CP invariance, and J.C. Cooper's criticism of the Segre-Chamberlain antiproton experiment) are examined to see if the normal procedures of science provide adequate safeguards against fraud. I conclude that repetition of experiments, particularly for those of theoretical importance, does provide a sufficient safeguard.

Author's address: Dept. of Physics, University of Colorado, Boulder, CO 80309.

EARLY FISSION

McCUE, J. Early days in heavy elements. Physics Today, August 1984, 37(8): 71-72.

On Ida Noddack's (1934) suggestion that neutron bombardment of heavy elements produced fission. With a reply by Ruth L. Sime.

BROOKHAVEN

NEEDELL, A.A. Nuclear Reactors and the Founding of Brookhaven National Laboratory. Historical Studies in the Physical Sciences, 1983, 14: 93-122.

Brookhaven National Laboratory was established immediately after the end of the Second World War as a means of providing a nuclear reactor for research somewhere in the northeastern United States. The difficulties experienced in organizing Associated Universities, Inc. (a nonprofit consortium associated with nine prestigious northeastern universities) to manage the laboratory, and the problems faced in acquiring the scientific, engineering and industrial expertise necessary to build the reactor are described.

Author's address: Space Science and Exploration Department, National Air and Space Museum, Smithsonian Institution, Washington, D.C. 20560.

RAMAN PHOTO

RAGHAVEN, R.S. Raman identified. Physics Today, August 1984, 37(8): 84.

Identifies C.V. Raman in a photo on page 42 in the February issue.

OPPENHEIMER

KEMPTON, MURRAY. The ambivalence of J. Robert Oppenheimer. As the architect of destruction, he was both history's conqueror and history's victim. Esquire, 1983, 100(6): 236-248.

The ferocious weapon first exploded secretly in the American desert in 1945 did not merely alter history, it loosed the power to end it. The bomb was the work of hundreds of keen minds, the foremost of which was J. Robert Oppenheimer's. He administered Los Alamos, where the weapon took form, and the glory of the accomplishment--if glory it was--belonged to him. Sadly, so did the later realization that what had been created was the distinct possibility of self-destruction.

LIBBY'S OBITUARY

SEABORG, GLENN T. Willard Frank Libby (Obituary). Physics Today, 1981, 34(2): 92-95.

Libby received the 1960 Nobel Prize in chemistry for the carbon-14 method of dating artifacts. He was born 17 December 1908 and died 8 September 1980.

HISTORY OF NSF

ENGLAND, MERTON J. A Patron for Pure Science: The National Science Foundation's Formative Years, 1945-57. Washington: National Science Foundation, 1982.

This is a history of the National Science Foundation (NSF) from its origins in World War II to the orbiting of the first Soviet Sputnik in 1957. A five-year congressional debate, mainly over control of the proposed agency, reached a compromise in the NSF act of 1950 by providing for a presidentially appointed director and a part-time policy-making National Science Board. The first director (Alan T. Waterman) and the board worked harmoniously in establishing programs of basic research and education and in avoiding the hazards of formulating national science policy and evaluating other federal science programs. The book describes the agency's slow budgetary growth, the administration of research and education programs, the beginning of "big science" activities, the gradual extension of support to the social sciences, the effort to provide reliable information on scientific research and man power, and the promotion of better government-university relationships.

HISTORY OF PHYSICS NEWSLETTER

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