

HISTORY of Physics

NEWSLETTER

From the Chair

Report From The Chair

by Nina Byers, Forum Chair

It is good to greet 2005 in which we have the centennial celebration of Albert Einstein's "miraculous year" and events marking the World Year of Physics (WYP). Hopefully as physicists we can reach out beyond our own community to share our love of science and promote the formation of long-lasting, peaceful, nurturing and productive societies. The Forum is engaged in various WYP activities. We are joining with the Topical Group in Gravitation (GGR) to provide a volunteer WYP Speakers Program for schools and other groups See <<http://www.physics2005.org/speakers/index.html>>. There is a fill-in form on the internet linked to this site to request a speaker and provide information about the talk a group would like to have. Richard Price <rprice@physics.utah.edu> of the GGR and our own Virginia Trimble <vtrimble@astro.umd.edu> are organizing this (see also her note in this Newsletter). There is some financial support, in part from APS Council, for speaker travel to institutions that do not have physics or physical sciences colloquia because they cannot afford them. Virginia writes 'we definitely need more volunteer speakers, especially people to talk about Einstein & history of physics (but also other

topics); volunteers should get in touch with me.' She also writes that students at 4-year colleges are targeted and that FHP members who are at 4-year colleges should encourage applications.

I am pleased to announce that in response to the generosity of donors a Special Programs Fund has been established in our APS account to receive and disperse funds earmarked for FHP. Details of the program are contained in the announcement that follows this article. Funds have been donated in 2004 to provide hard (paper) copies of our *Newsletter* and to reimburse, where needed, invited speakers' travel expenses. It is hoped in the future Funds might also provide grants for research in history of physics and/or reimbursement of travel expense for presentation of contributed papers at APS meetings on history of physics. Generally work on history of physics and travel to meetings to give papers on history of physics are not funded by sources which fund physics research. Therefore the Forum on History of Physics might make significant contributions to our subject were we able to materially support some work; e.g., historical research generally requires documentation and bibliographic work that involve some expense. In my work I have found that students as paid research assistants have contributed greatly. Though their pay is small physics majors find the work very rewarding because they learn some physics, and about history of physics and library resources. I plan to introduce a motion at our next Executive Committee meeting next April to establish a committee that will receive and administer grant proposals. Donors are requested to send funds to the

continued on page 2

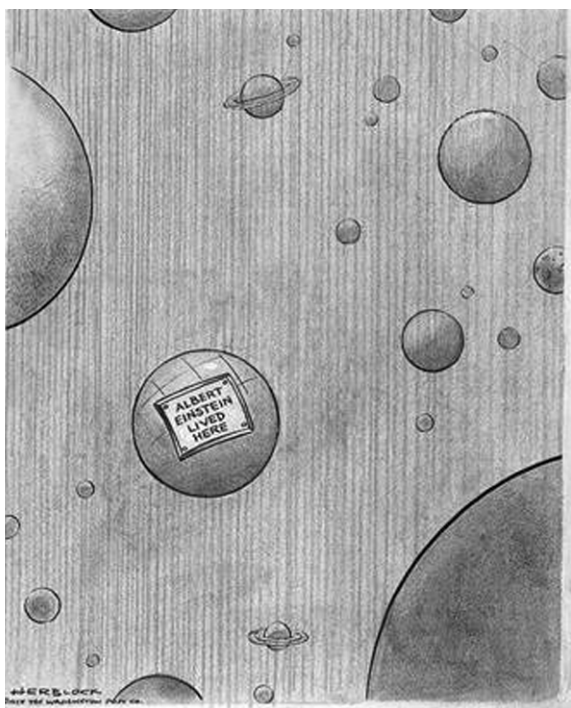


Figure 1. Reprinted with permission The Herb Block Foundation EIN no. 26-0008276

INSIDE

Editor's Note	2
Forum News	3
Call for Nominations	4
Meeting Programs	5
Notes, Reports and Announcements	11
Book Reviews	15

The *History of Physics Newsletter* is published twice yearly by the *Forum on History of Physics* of the American Physical Society. It is distributed free to all members of the Forum. The Forum also has reciprocal arrangements with the History of Science Society, Philosophy of Science Association, HOPOS. Nonmembers who wish to receive the Newsletter should make a donation to the Forum of \$5 per year (+ \$3 additional for airmail). Each 3-year volume consists of six issues.

Editor

Benjamin Bederson
New York University
Physics Department
4 Washington Place
New York, NY 10003
ben.bederson@nyu.edu
(212) 529 8687

Associate Editor

Michael Riordan
Institute of Particle Physics
University of California
Santa Cruz, CA 95064
michael@scipp.ucsc.edu
(831) 459 5687

Editor's Note

Online vs. Paper

As noted in the previous *Newsletter*, because of an anonymous gift we can ensure that all FHP members will continue to receive a print version, unless they specifically request not to receive same. Readers so requesting should send an email note to the Editor.

Invitation to our Members

Your program committee invites you to suggest topics/speakers for several FHP invited sessions for the March and April 2006 meetings. You will normally then be asked to help organize the sessions. These can be sponsored just by FHP, topics suitable for co-sponsorship by Divisions, Topical Groups, or other Forums, or (a particularly desirable format) one invited talk followed by several contributed ones, called a "focussed session." There is already at least one suggestion each for March and April. Please communicate others to the 2006 program chair, vtrimble@uci.edu.

FHP Homepage:

All kinds of information concerning FHP activities are available on the FHP website <http://www.aps.org/units/fhp/index.cfm>, to

which the reader is invited. You can also access all past issues of our Newsletter there.

Corrigenda

In the last *Newsletter*, in the contributed papers session, we referred to Ms. Elisabeth M. Sopka's father as the late Dr. John J. Sopka. We are happy to say that this characterization is incorrect, and apologize for the error.

In the book review of *Degrees Kelvin* by Davis Lindley, the river Kelvin was incorrectly placed near Cambridge. I quote from a note sent to me by Sidney Abrams, Southern Oregon University, whom I thank for this correction: "Thomson indeed took the name Kelvin from a small river for the title given him by Queen Victoria. However, this river is located not in Cambridge but in Glasgow! The Kelvin runs quite close to the University of Glasgow campus. The Botanic Gardens, the University, Kelvin Hall and the Kelvingrove Art Gallery and Museum all lie on its banks. The Kelvin flows into the River Clyde shortly thereafter." —BB

Report from the Chair

continued from page 1

APS, Director of Development noting that they are earmarked for the FHP Special Fund. The donor may specify a particular purpose for which he/she would like the funds to be used. Funds donated to APS are tax deductible.

Comments and discussion on the above are very welcome and should be sent either to the Editor of the Newsletter or to me <byers@physics.harvard.edu>.

Regular FHP activities have proceeded with success in 2004. The Program Committee, chaired by Bob Romer, has arranged attractive invited speaker sessions in the March (LA) and April (Tampa) APS general meetings. Please see the updated Program Bulletins for details: viz., <<http://www.aps.org/meet/MAR05>> and/or <<http://www.aps.org/meet/APR05>>, and the material on these meetings contained in this Newsletter. A new development is

a Named Lecture "At the March meeting A.J. Kox will present the first Robert H. Dicke lecture on Einstein and Lorentz." The April meeting will be particularly rich in FHP activities. Lillian Hoddeson will give the Gertrude-Scharff Goldhaber Lecture, sponsored by the Goldhaber family in honor of Trudi. In a joint session with the Forum on Physics and Society, we will mark the occasion of the first Abraham Pais Award to Martin Klein and he will deliver a lecture entitled "Physics, History, and the History of Physics." The Leo Szilard Prize winner will also speak in that session. We encourage as many FHP members as possible to attend this session. We will also have our annual FHP Business Meeting in Tampa and look forward to seeing as many of you as possible there. Another new development is sponsorship of Contributed

Paper sessions in *both* the March and April meetings.

All in all the activities of our Forum are rich and varied and promising for the future where we can safely predict increasing interest in the history of physics. Our history provides good illustrations of the efficacy of collaborative efforts and rational thought that might be inspirational beyond the borders of our profession. I'd like to end by reminding readers of Sir Arthur Eddington who led the 1919 eclipse expedition to observe the bending of light passing close to the sun. It is said that, arising out of his Quaker upbringing, his motivation in part was to counter the widespread hostility to the Germans in World War I. On 3 June he recorded in his notebook:... *one plate I measured gave a result agreeing with Einstein*. As a conscientious

continued on page 10

FORUM ON HISTORY OF PHYSICS SPECIAL PROGRAM FUND

Purpose

The purpose of the Special Program Fund is to enlarge or enhance FHP's activities beyond what is possible with the resources and restrictions of the regular operating budget. Source Moneys for this Fund will be solicited and accepted from individual donors, educational institutions, professional organizations, foundations, government agencies, and corporations. An incentive to prospective donors will be the tax deductibility of the gifts. Solicitations may be made by any member of FHP with the concurrence of FHP's Chair and Secretary-Treasurer. Unsolicited donations may also be accepted.

Receipt and Acknowledgment of Contributions

Donors will be requested to direct their contributions to the American Physical Society's Director of Development. The Director will acknowledge the gift, issue a "tax receipt," and notify the FHP Chair and the Secretary-Treasurer, and, if

known, the solicitor, of the gift's arrival.

Selection and Approval of Programs for the Special Fund

The FHP Executive Committee will, at its annual meeting, establish a priority list of activities for which donations to the Special Fund are to be sought. If a donation is received without specification as to its use, the Secretary-Treasurer, with the approval of the FHP Chair, will allocate funds from the gift to the priority programs, as needed. If these unrestricted funds are not needed for this purpose, the officers of FHP shall prepare a proposal and budget for a new initiative and submit it to the Executive Committee for consideration and approval. If a prospective donor proposes to donate funds for a program not on the priority list, the officers shall consider the proposal, and, if it is acceptable, submit it to the Executive Committee for approval. If it is not acceptable, or if modifications are needed, the most appropriate person (usually the Chair or Secretary-Treasurer)

shall "negotiate" with the donor about FHP using the gift for another program. If a donation, solicited or unsolicited, is received with an unacceptable restrictions attached, the most appropriate person (normally the person who solicited the gift or, if the gift is unsolicited, the Chair or the Secretary-Treasurer) shall attempt to convince the donor to remove the restriction. If this effort is not successful, the gift will be declined or returned.

Administration of and Disbursements from Fund

The fiscal administration of the Special Programs Fund shall be the joint responsibility of the APS Treasurer's office and FHP's Secretary-Treasurer. Disbursements shall be made by the APS Treasurer upon authorization by the FHP Secretary-Treasurer. Receipts, expenditures, and the balance of the Fund shall be reported by the Secretary-Treasurer to the Executive Committee and the general membership at least annually.

WORLD YEAR OF PHYSICS

Events related to the World Year of Physics (WYP), also known as the Einstein Year, are too numerous to list here. For full details of activities around the world, see <http://www.physics2005.org/> or <http://www.wyp2005.org/>

SPEAKERS WANTED

Do you like to talk about and/or hear about history of physics? Then please take advantage of this outreach/involvement opportunity. You may recall from earlier announcements that FHP has joined with the Topical Group on Gravitation and General Relativity and the Division of Astrophysics to provide a pool of speakers on topics particularly suitable for the World Year of Physics (Einstein's Wonder Year centenary and all that). The primary target is students at four year colleges who already have some interest in science, and the hope is that we can encourage them to remain in

science through a BS and perhaps graduate school by sharing with them some of the excitement of physics. Two year colleges, community groups, planetariums, and even PhD-granting institutions are also welcome to request speakers.

If you are at a 4-year college or other relevant institution and would like to host a speaker, the request web site is <http://www.phys.utb.edu/WYPspeakers/REQUESTS/howto.html>

There is some money available to support travel of speakers to deserving institutions that do not normally have a colloquium series because they cannot afford it. The request web site has a spot for noting the need for travel support. If you are willing to be a speaker for a 4-year college student target audience, please contact FHP vice chair Virginia Trimble (vtrimble@uci.edu) with Your Name, Your Location, one or more Topics or Titles relevant to WYP,

general relativity, history of physics and astrophysics that you would be willing to talk about. A large number of early requests were for speakers on historical topics explicitly involving Einstein, and volunteers in this territory are particularly welcome.

—Virginia Trimble

ABRAHAM PAIS AWARD

continued from page 10

Please send your pledges or contributions to Darlene Logan, Director of Development American Physical Society. One Physics Ellipse College Park, MD 20740-3844 Phone:(301)209-3224 Fax (301)209-0867 E-mail: logan@aps.org

For the Pais Award Committee—Ben Bederson, Gloria Lubkin, Michael Riordan, Roger Stuewer, Spencer Weart—Harry Lustig: Chair.

ANNOUNCEMENT OF ELECTION FOR FORUM OFFICERS

In the upcoming election, you will be asked to vote for Vice Chair, Secretary-Treasurer, Forum Councillor, and two At-Large Members of the Executive Committee. If you have an email address registered with APS, you will receive a message inviting you to vote electronically. If not, you should have received a paper ballot by mail. If you want a paper ballot but have not yet received one, please email your request, including your mailing address, to kwford@verizon.net or contact Ken Ford, 729 Westview Street, Philadelphia PA 19119-3533 (phone 215-844-8054). **The closing date of the election is March 11.** Ballots must be executed on the Web or received by that date to be valid.

Biographical information and statements by the candidates appear below. Duplicate of this material can be found at <http://www.aps.org/units/fhp/elections/candidates05.cfm>

Candidates' Statements

Candidates for Vice-Chair

William Evenson

Institution: Utah Valley State College (Brigham Young University, retired)

Email: bill.evenson@uvsc.edu

Biographical Information: Bill Evenson is an APS Fellow and long-time participant in FHP. He served as FHP program chair in 1995-96 and on the committee to commemorate the centennial of the discovery of the electron in 1997. He was FHP Secretary-Treasurer from 1998 to 2001 and editor of *History of Physics Newsletter* for six-and-a-half years from 1997 to 2003. From 2001 through 2003 he served on the APS Panel on Public Affairs (POPA). He is a current member of the Editorial Board of the journal *Physics in Perspective*. His long-standing interest in the history of physics continues in parallel with other activities in the physics community. He was the founding chair of the APS Four Corners Section, where he instituted and promoted what has become a successful program of public-outreach lectures connected to the annual section meeting, and he is currently Secretary-Treasurer of that section.

Evenson is Associate Dean of Science & Health at Utah Valley State College. He was Professor of Physics at Brigham Young University for 34 years and served as Associate Academic Vice President, Dean of the College of Physical and Mathematical Sciences, and Dean of General Education. He received his Ph.D. in theoretical condensed matter physics from Iowa State University

in 1968. He was an NSF postdoctoral fellow at the University of Pennsylvania with J. R. Schrieffer. His physics research now deals mainly with studies of surfaces, defects in materials, and inverse problems in statistical physics. He was a Fulbright Senior Scholar (research) at University of Konstanz, Germany, for 1998-99.

Statement: The Forum has made important contributions to the physics community by fostering presentations and reports that both communicate and preserve physics history. The Abraham Pais Award for the History of Physics provides both recognition and strong encouragement for scholarly work in the history of physics. I would like to help the Forum strengthen its efforts further in these areas—keeping history of physics a lively and compelling part of APS meetings, activities, and awards, and in two other important areas: the use of history to bring a fuller understanding of physics to the general public and increased, more effective use of history in physics and science education.

I have urged in *History of Physics Newsletter* that we should use accurate history of physics more often as a guide in the teaching of physics, in explaining science to the public and to policy makers, and in our research in physics. For maximum effect in this effort, we must convey fully the realities of doing physics (something that is frequently done admirably in the journal *Physics in Perspective*). FHP needs to be at the forefront of dissemination of the perspective on physics that is possible through history. FHP must continue to en-

courage our colleagues in the preservation of history: archiving their papers; writing memoirs, obituaries, reports and reviews of important work and of interactions with memorable colleagues; and including relevant and accurate history in talks and reports to the public and to other physicists. Our efforts to produce and preserve first-hand history of physics are crucial. Working to bring the history of physics into more common currency in education and public outreach, I would seek to strengthen our ties to related organizations in both physics and physics history so we can more effectively make common cause. These organizations include the Committee on History and Philosophy of Physics of AAPT, the History of Science Society, and history groups in related disciplines (astronomy, geophysics, *etc.*) and in other regions of the world.

C. Stewart Gillmor

Institution: Wesleyan University

Email: sgillmor@wesleyan.edu

Biographical Information: Stewart Gillmor attended the original organizing meeting of the Forum (then Division) on the History of Physics at Baltimore more than twenty years ago, and has served FHP in several capacities since then. Following receipt of his BSEE degree from Stanford University, he did graduate work in Astro-Geophysics at the University of Colorado and worked at the National Bureau of Standards. He earned his Ph.D. in the history of science at Princeton University, working

Candidates' Statements

with Thomas Kuhn and Charles Gillespie. His research and writing is in the history of physics and engineering. His books include *Coulomb and the Evolution of Physics and Engineering in Eighteenth-Century France*; several volumes in the AGU series *History of Geophysics*, including *Discovery of the Magnetosphere* (edited with John R. Spreiter); and, most recently, *Fred Terman at Stanford*. He is currently studying Hal Middleton (1851-1932), who, with J. A. Fleming, was the last student to attend lectures of James Clerk Maxwell.

Statement: I have always been grateful for the open acceptance and support by physicists of us traditional historians of science. In service to the Forum I would wish to continue our presentation of interesting, sometimes controversial, topics at our own APS meetings and also try to bring closer to APS those historians of physics who research and write somewhat out of our purview. I am quite pleased that we have established a Prize for accomplishments in the history of physics within the APS.

Candidate for Secretary-Treasurer

Larry Josbeno

Institution: Corning Community College

Email: josbenlj@corning-cc.edu

Biographical information: Larry Josbeno is professor of physics at Corning Community College in Corning, New York. He received his B.S. degree from St. Bonaventure University and his M.S. degree from the University of New Hampshire. He has pursued graduate work at Rensselaer Polytechnic, Penn State, Princeton, and Cornell, and has conducted research in beam-beam interactions in high-energy physics. He is Director of the Corning Community College Observatory.

Josbeno has 43 years of experience teaching physics at the high-school and community-college levels. He is a past President of the APS New York State Section and, since 2001, Secretary-Treasurer of that Section. He is also past President

and a fellow of Science Teachers of New York State. His honors include the New York State Presidential Award and the Chancellor's Award, both for excellence in teaching.

Statement: I believe that we physicists, educators, and scientists in general should do more to promote an appreciation and an understanding of the history of physics. We must foster interest in our students and colleagues by exposing them to the exciting development of physics and related areas of science. I have served four years as Secretary-Treasurer of the New York State Section of APS and have worked extensively with the APS Accounting Department. I have also attended four APS Unit Convocations.

My interest in becoming Secretary-Treasurer of the Forum on History of Physics is to use my experience to ensure good fiscal management of FHP's finances and the continuity of our successful *Newsletter*, as well as to look for ways to create new programs to supplement our current activities.

I believe that APS can do more to increase the general public's awareness of the importance of physics education and research through all its Sections and Forums. I would welcome the opportunity to participate in the Forum on History of Physics.

Candidates for Forum Councillor

William Blanpied

Institution: George Mason University (NSF retired)

Email: wblanpie@gmu.edu

Biographical Information: William A. Blanpied is Senior Research Scholar in the Science and Trade Policy Program at George Mason University. Until his retirement from the federal government in January 2003, he had been Senior International Analyst at the National Science Foundation (NSF) since 1983. Prior to joining NSF as Program Manager for Ethics and Human Values in Science and Technology in 1976,

he held faculty appointments in the physics departments at Case Western Reserve, Yale, and Harvard Universities, where his research interests were in experimental particle physics. While at Harvard, he established and served as first editor of an international newsletter that has since evolved into the quarterly journal, *Science, Technology and Human Values*. He left Harvard in 1974 to head the Division of Public Sector Programs at the American Association for the Advancement of Science (AAAS), where he was instrumental in organizing the first AAAS Science and Technology Policy colloquium, now held in Washington, DC, each April.

Blanpied received his Ph.D. in physics from Princeton University in 1959. He is a Fellow of the APS and the AAAS. He is the author or co-author of three books, and has published numerous articles and reviews in the professional literature on physics, history of science, international science, and science policy, including both its national and international aspects. His historical interests have focused on the development of science policy in the United States since WWII and comparative science policies in the United States and East Asia.

In April 2003, Blanpied was designated an International Affiliated Fellow of the National Institute for Science and Technology Policy in Tokyo, at the conclusion of three years as Director of the NSF's Tokyo Regional Office in the US Embassy. During the 2003 autumn semester, he was Visiting Professor in the School of Public Policy and Management at Tsinghua University, Beijing.

Statement: Since the days when I taught "Physics for Poets" as a newly-minted assistant professor, I have been insisting that physics is not only the fundamental basis for all science, but is also an integral component of the liberal arts and, thus, that some knowledge of physics is essential to all educated persons. Perhaps the best way to emphasize the latter points is to help all physicists, particularly those who teach new generations of scientists and non-scientists alike, to understand better the many facets of the history of physics: e.g., the history of individual discoveries,

continued on page 6

Candidates' Statements

continued from page 5

the evolution of scientific institutions, and the relationships of physics to government and to the broader society. The Forum on History of Physics (FHP) has an enviable record of organizing interesting and well-attended sessions at national, regional and topical APS meetings. I would strongly support, and contribute to, the continuation of these efforts.

Since a sizeable fraction of APS members now work abroad, I would also try to interest more foreign members in joining the FHP, ask for their suggestions about sessions on the history of physics in non-Western countries, and also nominate distinguished non-Western members as FHP officers. As one means for making the importance of the history of physics more broadly recognized, I would also attempt to identify nominees for the APS presidency who have a demonstrable interest in history of physics, and who have perhaps made some contributions as well.

In view of the intense competition among younger physicists to obtain satisfactory positions and to advance in those positions, few are able to devote substantial time to serious historical research and writing. However, I do believe that we can do more to interest these younger colleagues in joining the FHP and perhaps standing for office so that in due course, the interests of at least a few of them will lead to significant scholarly contributions. This, I believe, may be the most significant contribution that we senior physicists can make to our profession and our avocation.

Roger Stuewer

Institution: University of Minnesota (retired)

Email: rstuewer@physics.umn.edu

Biographical Information: Roger Stuewer received his Ph.D. degree in 1968 from the University of Wisconsin with a double doctoral major in the history of science and physics. He currently is Professor Emeritus of the History of Science and Technology at the University of Minnesota with faculty appointments in the School of Physics and Astronomy and the Minnesota Center for Philosophy of Science.

He has taught courses on the history of nineteenth- and twentieth-century physics, supervised the Ph.D. dissertations of nine graduate students in the history of physics at Minnesota, and served as external examiner for seven Ph.D. dissertations in the history of physics at other universities in North America and Europe. He has held visiting professorships in the history of physics at the Universities of Munich, Vienna, Graz, and Amsterdam, and has given over 100 invited lectures in many countries of the world. He has published numerous articles on the history of quantum and nuclear physics and has written, edited, or co-edited eight books, including *The Compton Effect* and *Nuclear Physics in Retrospect*. He has served as Secretary of the History of Science Society, Co-Chair of the International Union's Commission on History of Modern Physics, Chair of the AIP Advisory Committee on History of Physics, Chair of both the APS Division and Forum on History of Physics, Member of the FHP Executive Committee, Chair of the APS/AIP Selection Committee for the Abraham Pais Award for the History of Physics, Chair of the AAAS Section on History and Philosophy of Science, President of the Minnesota Chapter of Sigma Xi, and Chair of the Advisory Board of the Seven Pines Symposium. He is Co-Editor of the journal *Physics in Perspective*, Editor of the Resource Letters of the *American Journal of Physics*, and serves on the Editorial Board of other publications and journals, including the *Archive for History of Exact Sciences*. He has been a Sigma Xi Distinguished Lecturer and an APS Centennial Speaker. He has received a Distinguished Service Citation from AAPT and the George Taylor Distinguished Service Award from Minnesota's Institute of Technology. He is a Fellow of the AAAS and of the APS.

Statement: The Forum on History of Physics has been and continues to be a major vehicle for advancing teaching and research in the history of physics, and for promoting public awareness and understanding of physics, bringing physicists and historians of physics together to pursue common educational, scholarly, and professional goals. I have devoted much of my academic and professional life to such cooperative and

mutually supportive activities, and I would look forward to continuing them during the World Year of Physics 2005 and beyond by serving the Forum on History of Physics as Forum Councilor.

Candidates for Executive Committee, At-Large

Charles Holbrow

Institution: MIT, Harvard (Colgate University, retired)

Email: cholbrow@mail.colgate.edu

Biographical Information: Charles Holbrow is a nuclear physicist with an extensive background and deep interest in history. After obtaining his B.A. in history from the University of Wisconsin, Madison in 1955, he attended Columbia University where he obtained an A.M. degree and passed his Ph.D. exams in history. He then returned to Wisconsin and obtained a Ph.D. degree in physics under the direction of Henry Barschall. During his career as a professional physicist, Holbrow has done fast-neutron spectroscopy, studied nuclear reactions with magnetic spectrographs, used laser beams to orient and examine short-lived nuclear isomers, and used laser spectroscopy to measure properties of atoms possessing nuclei far from the line of stability. Recently he collaborated in developing for undergraduates a set of experiments that use entangled photon states to exhibit vividly the remarkable consequences of quantum superposition.

Throughout his physics research career Holbrow maintained an active interest in the history of physics. In 1981 his history of the founding of Caltech's Kellogg Radiation Laboratory was published in *Physics Today*. In 1995 he spent a sabbatical as Visiting Scholar in The History of Science Department at Harvard. In 1999, on behalf of the Forum on Education, he prepared and presented an exhibit on the historical evolution of physics textbooks for the APS Centennial celebration, and he published the related article "Archaeology of a Bookstack" in *Physics Today*. In 2003 his biographical essay on Charles Lau-

Candidates' Statements

ritsen, a pioneering nuclear physicist and influential advisor to the U.S. government, was published in *Physics in Perspective*. This article is part of his current work on the origins, accomplishments and problems of physicists advising the U.S. government.

Holbrow is Charles A. Dana Professor Emeritus, Colgate University, and Visiting Scientist at MIT's Harrison Spectroscopy Laboratory and Visiting Scholar at Harvard University's Department of Physics. He is a Fellow of the American Physical Society, a member of the APS Division of Nuclear Physics, the Forum on Education, and the Forum on the History of Physics. A long-time member of the American Association of Physics Teachers, he has served as vice president, president elect, president (2003), and past president. He is a member of the History of Science Society.

Statement: I strongly support FHP's stated objectives of encouraging scholarly research in the history of physics and of helping to diffuse this knowledge. I think that FHP has a crucial role to play as the meeting place of those who make physics history and those who interpret it. By its sessions at APS meetings and its newsletter FHP also helps APS members and the broader public appreciate the human side of physics and physicists, their excitement, their achievements and their personalities. FHP programs foster a sense of community among physicists while showing them how their contributions fit into the larger picture of science and of society. If elected to the FHP Executive Committee, I will work hard to sustain and extend FHP efforts to preserve the records and heritage of physics and to help physicists better know their great tradition.

J. David Jackson

Institution: University of California, Berkeley

Email: jdjackson@lbl.gov

Biographical Information: David Jackson is a theoretical physicist who received his B.Sc. in Honours Physics and Mathematics from the University of Western Ontario in 1946 and his Ph.D. in Physics from the Massachusetts Institute of Technology in

1949. His academic career has been at three universities—McGill University in Montreal, University of Illinois in Urbana-Champaign, and University of California, Berkeley. Beginning in nuclear physics, he has worked in particle physics for most of his career, with forays into electromagnetic theory (field theory of traveling-wave tubes), atomic collisions, plasma physics, muon-catalyzed fusion, and energy loss, among other topics. Jackson is author of the well-known text, *Classical Electrodynamics*, now in its third edition, as well as two smaller physics books. In recent years he has published a number of pedagogical articles in the *American Journal of Physics*. He is Fellow of the American Physical Society, Member of the American Academy of Arts and Sciences and the National Academy of Sciences. He is presently Professor Emeritus of Physics, UC Berkeley, and Participating Retiree, Physics Division, Lawrence Berkeley National Laboratory.

Jackson is a life-long amateur in the history of science, particularly of physics. His record of publication in the history of science is thin, with his paper with Lev Okun, *Historical roots of gauge invariance* [*Rev. Mod. Phys.* **73**, 663-680 (2001)] the most notable. He has also written NAS biographical memoirs of Edwin Mattison McMillan (with W. K. H. Panofsky), Emilio Segrè, and Victor Frederick Weisskopf (with Kurt Gottfried), as well as a paper on Weisskopf's research in the CERN Courier and a tribute to Weisskopf in *Physics Today* (with Gottfried). He has very recently edited *History of the Berkeley Physics Department, 1950-1968*, from the unfinished draft of A. C. Helmholz.

Statement: The history of physics has much to teach present-day physicists and others about how insights or discoveries were made and propagated (or not) to the larger scientific community and how physicists in the past interacted with society to help shape its advancement. I find young physicists largely ignorant of the originators of ideas and techniques that are common currency in physics today. Specific instances with full development of each context can illuminate the why and how, and the reasons for lasting or transitory importance. I think the younger physicists will be the better for a knowl-

edge of on whose shoulders they stand and cavort. The Forum on the History of Physics needs to broaden its membership with younger physicists. The success of a dozen colloquia based on my paper with Okun shows a real interest among all ages in accounts of the history of physics. The Forum might redouble its efforts to have the colloquium chairs around the country feature at least one historical colloquium each term. Another project, brought to mind by my work on the Helmholtz history, would be the preparation of a bibliography for the whole country of all available histories of physics departments, many informal and unknown outside the individual institutions.

Gordon Kane

Institution: University of Michigan, Ann Arbor

Email: gkane@umich.edu

Biographical Information: Gordon Kane is a theoretical particle physicist and particle cosmologist. He has published over 165 research papers, written or edited eight books, and given over 175 talks at national or international meetings plus many seminars, colloquia, and public talks. Two of the books are for general readers. He has been a J. S. Guggenheim Fellow, and is a Fellow of the American Physical Society, a Fellow of the American Association for the Advancement of Science, a Fellow of the Institute of Physics of England, and a Fellow of the Johns Hopkins Society of Scholars. He is the Victor Weisskopf Collegiate Professor of Physics at the University of Michigan, and Interim Director of the Michigan Center for Theoretical Physics.

Statement: Four centuries ago there was no understanding of how the natural world works, or why it is as it is. Today a great deal is understood. How we got from there to here is fascinating and should be better known to scientists and to everyone. History adds meaning to science. I am convinced that understanding how scientific progress occurs improves our ability to make progress, and should be more widely

continued on page 8

Candidates' Statements

continued from page 7

available to scientists. I have occasionally taught a general undergraduate course that covers scientific developments in their historical context, "From the Greeks to quarks and dark matter." Understanding the history, and why science flourishes better in some cultures than others, has long been important to me, and I would be happy to contribute to broadening the appeal and availability of the history of science via the Forum on the History of Physics.

Catherine Westfall

Institution: Argonne National Laboratory, Michigan State University

Email: cwestfall@nscl.msu.edu

Biographical Information: Catherine Westfall is a historian of physics who currently heads a history group at Argonne National Laboratory. Her position is supported by the Office of the Director and supervised through the Physics Division. From the time of her Ph.D. work in the 1980s at Michigan State University in the history of American physics, Westfall has focused on the history of various projects at U.S. national laboratories.

In 1993 along with Lillian Hoddeson and others, she published *Critical Assembly: A Technical History of Los Alamos During the Oppenheimer Years, 1943-1945*. With Hoddeson and Adrienne Kolb she will soon publish a history of Fermilab through the 1980s. In addition to documenting the founding of Fermilab, a topic covered in her dissertation and summarized in a *Physics Today* article, Westfall wrote chapters on the discovery of the bottom quark and the development of the CDF and D-0 detectors. She has also published several articles on the history of nuclear physics, including a study of the advent of relativistic heavy ion physics at Lawrence Berkeley Laboratory and the launching of Jefferson Laboratory's pioneering effort in superconducting radiofrequency accelerator technology. She is currently completing a paper on the fifty-year development of Mössbauer spectroscopy at Argonne which emerged from a

continued on page 8

OTHER NOTEWORTHY CENTENNIALS (AND BICENTENNIALS)

It wasn't just Einstein. J. Robert Oppenheimer was born in 1904. William Hamilton, of Hamiltonians and quaternions fame, was born in 1805. We note below two occasions marking these events.

William Rowan Hamilton

2005 marks the bicentenary of the birth of William Rowan Hamilton, Ireland's greatest scientist, the namesake of the ubiquitous Hamiltonian, and the creator of quaternions, the precursor of the Pauli spin matrices. 2005 has been designated by the Irish Government as "Hamilton Year 2005: Celebrating Irish Science", sharing this year with the World Year of Physics, and Einstein.

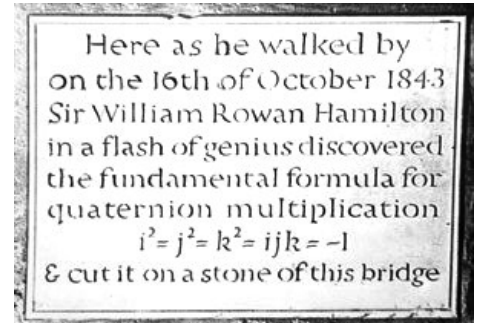
Contact Niamh Morris, at n.morris@ria.ie of the Royal Irish Academy for more details.

J. Robert Oppenheimer: Preserving the Manhattan Project Heritage at Los Alamos, NM: Program on "Oppenheimer and the Manhattan Project" Held June 25 and 26, 2004 in Los Alamos, NM.

Cynthia C. Kelly, Atomic Heritage Foundation

The Atomic Heritage Foundation, a non-profit organization in Washington, DC dedicated to preserving the history of the Manhattan Project and the Atomic Age, organized the two-day program in partnership with the Los Alamos National Laboratory, the Los Alamos Historical Society, State of New Mexico Historic Preservation Division, National Atomic Museum and other partners.

The program included tours of some of the last remaining properties from the Manhattan Project at Los Alamos that are to be restored with the help of a Save America's Treasures grant. Two properties are the high-bay building at the "V Site" where the Trinity device was assembled and the "Little Boy" site where tests were conducted for the uranium-based or gun-type bomb. Also included on the tour was the house where Oppenheimer and his family lived, a former Master's Cottage of



Plaque to William Rowan Hamilton at Broome Bridge in Dublin, (above) and below is a reproduction of what he actually cut: [Figure 2]

$$i^2 = j^2 = k^2 = ijk = -1$$

Figure 3. Courtesy of the Royal Irish Academy.

the Los Alamos Boys Ranch School, which was recently acquired by the Los Alamos Historical Society.

On Saturday, June 26, a symposium on "Oppenheimer and the Manhattan Project" was held. Leading authors Richard Rhodes, Ferenc Szasz, Gregg Herken, Robert Norris, Kai Bird and other experts on the Manhattan Project spoke about Oppenheimer's role, the significance of the Manhattan Project and its legacy for today. In addition, Manhattan Project veterans provided some first-hand accounts.

Preservation of the Manhattan Project history at Los Alamos and the other sites is important to the current mission of the Los Alamos National Laboratory. As Laboratory Director Peter Nanos stated in support of the legislation to include Los Alamos in the National Park System, "Having a stronger historical perspective and interpretation of the Manhattan Project... will help increase employee morale and provide the Laboratory with an additional resource in recruiting the next generation of scientists and engineers."

For more information, send an e-mail to info@atomicheritage.org, see <http://www.atomicheritage.org/> or call the Atomic Heritage Foundation at 202-293-0045.

MARCH AND APRIL APS MEETINGS

For the first time contributed papers were solicited for the March APS meeting. Eight such papers have been submitted. Twelve contributed papers are being presented orally at the April meeting, in three sessions. Here is a summary of titles and authors of papers to be presented at both meetings. Details will appear in the Fall Newsletter; full abstracts can be accessed at the APS website <http://www.aps.org/units/fhp/meetings>.

We offer our sincere thanks to Laurie Brown for his help in organizing the Einstein and Friends sessions at both the March and April meetings.

MARCH 2005 MEETING, FHP SESSIONS

INVITED PAPER SESSIONS

Session B5: Einstein and Friends I Chair: Virginia Trimble, University of California, Irvine, March 21, 2005

Einstein and Millikan, Charlotte Erwin, California Inst. of Technology

Einstein and Lorentz (The Robert H. Dicke Lecture), A. J. Kox, University of Amsterdam

Einstein and Hilbert, John Stachel, Boston University

Emmy Noether on Conservation of Energy in the General Theory, Nina Byers, Physics Department, Harvard University

Session N7: Einstein and Friends II Chair: Alex Maradudin, University of California, Irvine, March 23, 2005

Einstein and Boltzmann, Michael Nauenberg, University of California, Santa Cruz

Einstein, Bohr and Born—Scientific Friendships and their Vagaries, Diana Buchwald, California Institute of Technology

Einstein and Planck, J.L. Heilbron, Worcester Oxford

Einstein and Ehrenfest, Martin J. Klein, Yale University

CONTRIBUTED PAPER SESSION

Session L19: History of Physics Chair: Nina Byers, UCLA Tuesday, March 22, 2005

Physics at Fisk University Ronald Mickens, Clark Atlanta University

Attempts to link Quanta & Atoms before the Bohr Atom model A. Venkatesan, Northeastern University; M. Lieber, University of Arkansas

Personal Recollections of Albert Einstein, Steven Moszkowski, UCLA

Ugo Fano, Enrico Fermi, and spectral line shapes Charles W. Clark, NIST

Citation Statistics From More Than a Century of Physical Review, Sidney Redner, CNLS, LANL, and Boston University

Sarah Frances Whiting: Foremother of American Women Physicists, Frieda Stahl, California State, Los Angeles

A half-century ago physicists missed a major public service opportunity, costing the human race widespread chronic illness and many deaths! Marjorie Lundquist, Bioelectromagnetic Hygiene Institute)

(Supplemental)

History of the Wave Structure of Matter, (WSM) Milo Wolff, MIT (retired); Geoff Haselhurst, Space and Motion-Australia

ALSO OF INTEREST

Session H6: The Physics Community's Defense of Human Rights, Chair: Myriam Sarachik, sponsored by Forum on Physics and Society

Session T1: Einstein and Condensed Matter, Chair Marvin L. Cohen University of California Berkeley sponsored by DCMP

Session V4: Albert Einstein and Social Responsibility, Chair Barbara Levi, *Physics Today*. Sponsored by Forum on Physics and Society

APRIL 2005 MEETING FHP SESSIONS

NOTE: The annual FHP business meeting will take place directly after the U11 session, from 5:10-6:00.PM. All FHP members are invited.

INVITED PAPER SESSIONS

Session C5: Quantum Optics Through the Lens of History Chair: Daniel Greenberger, City College of New York, April 16, 2005

Leonard Mandel and Experimental Tests of

Quantum Mechanics, Joan Lisa Bromberg, Johns Hopkins University

Quantum Optics from the Beginning—Reflections from Rochester, Joseph H. Eberly, University of Rochester

From Bohm to Aspect: Philosophy Enters the Optics Laboratory Invited, Olival Freire, Federal University of Bahia, Salvador, Brazil and Dibner Institute, MIT

Session J5: Einstein and Friends, Chair: Robert H. Romer, Amherst College, April 17, 2005

Einstein and Besso, Michel Janssen, University of Minnesota

Einstein, Mach, and the Fortunes of Gravity, David Kaiser, MIT

Einstein and Bose, Kameshwar C. Wali, Syracuse University

Session T6: JOINT SESSION, CO-SPONSORED BY FHP AND FORUM ON PHYSICS AND SOCIETY Chair: Joel Primack, University of California-Santa Cruz, April 18, 2005

Pais History of Physics Award History, and the History of Physics, Martin J. Klein, Yale University

Burton Award Talk: Science Under Attack: Intelligent Design, Lawrence Krauss, Case Western Reserve University

Leo Szilard and the role of physicists in countering nuclear threats, Daniel Kleppner, MIT

Current nuclear threats and possible responses, Frederick K. Lamb, University of Illinois at Urbana-Champaign

The impact of the APS study and the future of boost-phase defense against ballistic Missiles, David E. Mosher, RAND, Washington, DC

Technical approaches to reducing the threat of nuclear terrorism, William C. Priedhorsky, Los Alamos National Laboratory

Session X13: The Rise of Megascience Chair: Adrienne Kolb, Fermilab Tuesday, April 19, 2005

Megascience on the Prairie: The Powers and Paradoxes of Pushing Frontiers at Fermilab

(The Gertrude Scharff-Goldhaber Lecture),

continued on page 10

MARCH AND APRIL APS MEETINGS

continued from page 9

Lillian Hoddeson, University of Illinois at Urbana-Champaign

Submicroscopic Nature Needs Megascience, Leon Lederman, Illinois Math & Science Academy

Some Observations on DOE's Role in "Megascience", Alvin W. Trivelpiece, Consultant Sandia National Laboratories

CONTRIBUTED PAPER SESSIONS

Session K11: History of Physics I Chair: Kenneth Ford, Retired, April 17, 2005

The rotational specific heat of molecular hydrogen in the old quantum theory, Clayton Gearhart, St. John's University (Minnesota)

To Wise King Ehrenfest: Humorous Writings by Oskar Klein and Others from 1930s Copenhagen, Paul Halpern, University of the Sciences in Philadelphia and Haverford College

Historic Objections to the Copenhagen Interpretation of Quantum Mechanics—How They Veered Close to Chaos Theory, Wm. C. McHarris, Michigan State University

Likelihood of women vs. men to receive bachelor's degrees in physics at Stanford, 1900-1929, Anthony Nero, Lawrence

Berkeley National Laboratory

Session R13: History of Physics II Chair: Roger H. Stuewer, University of Minnesota April 18, 2005

Plato's Timaeus and Modern Particle Physics, Ruprecht Machleidt, University of Idaho

Early radium experiments in Guadalajara, Mexico, Durruty Jesus de Alba Martinez, Inst. de Astronomia y Meteorologia, CUCEI, Universidad de Guadalajara

U.S. Scientists and the Chinese Reception of Relativity, Danian Hu, The City College of New York

Disaster Scenarios at Nuclear Accelerators, Joseph Kapusta, University of Minnesota

Session U11: History of Physics III Chair: Robert H. Romer, Amherst College, April 18, 2005

My Half-Hour with Einstein, Robert H. Romer, Amherst College

Did Heisenberg Spit at Max Born?, Harry Lustig, City College of the CUNY

The Rayleigh Papers, Thomas Miller, Hanscom AFB & Benjamin Bederson, New York University

On The Hilbert-Einstein Priority Dispute, Friedwardt Winterberg, University of Nevada, Reno

Report from the Chair

continued from page 2

objector during the war he avoided active war service and made important contributions to the general theory of relativity starting in 1915. In a parody of the *Rubaiyat* of Omar Khayyam¹, after observing the bending of light around the sun, he wrote:

*Oh leave the Wise our measures to collate
One thing at least is certain, light has weighed
One thing is certain and the rest debate
Light rays, when near the Sun, do not go
straight.*

We have wonderful recorded memories of scientists (including Khayyam) in our history, and sharing that is a worthy endeavor. I am grateful to the members of the Forum on History of Physics for the opportunity to serve as its Chair in the 2004-2005 term.

1. Omar Khayyam (1048 - 1131) was an outstanding mathematician and astronomer. Khayyam's fame as a poet has caused some to forget his scientific achievements which were much more substantial; see, e.g., <<http://www-gap.dcs.st-and.ac.uk/~history/Mathematicians/Khayyam.html>>.

ABRAHAM PAIS AWARD IN HISTORY OF SCIENCE

The initiative to establish an annual American Physical Society/American Institute of Physics Award in the History of Science was launched in the summer of 2002. In 2003 the Award was named in honor of the distinguished physicist—historian Abraham Pais.

In the most recent Newsletter we were able to report that, thanks to the generous responses by many donors to our fundraising efforts, the endowment had reached well over the \$100,000 required to establish an Award. Therefore with the endorsement of the Forum on History of Physics' Executive Committee and the APS, we raised our sights to create the *Pais Prize* (rather than Award) in the History of Physics.

A prize is much more prestigious than an award, both for the recipient and for the field in which it is given. It requires an

endowment of \$200,000 and awards a stipend in the amount of \$10,000 to the winner. In effect, only a total of \$187,000 in gifts and pledges needs to be secured for the Pais Prize, because that amount will trigger a final gift of \$13,000 from the Lounsbury Foundation.

Over the past six months we have made good progress toward reaching the goal. An important positive factor has been the solicitation of Bram Pais' former colleagues and friends at Rockefeller University. It has brought in over \$10,000 so far.

With this addition the total (not counting the Lounsbury "topping off" contribution) stands at \$155,000. Then only two weeks ago, John Armstrong, who had previously made a very generous gift, agreed to a new challenge grant. He will match, dollar for dollar, all donations

received until June 30 2005, up to a total of \$16,000.

It would be very nice, if we could collect the required \$16,000 in time to be able to bestow the Prize, rather than an Award, on the first winner, in April 2005, and not only on his successors. The first winner is Prof. Martin J. Klein of Yale University. He will give his Prize (or Award) lecture at the 2005 APS meeting in Tampa in a session that begins on Monday, April 18th at 13:30.

We are asking members of FHP and other recipients of this Newsletter to dig into their pockets (even if you have already done so) with contributions or pledges (payable over as long as three years) to help assure that we collect the missing \$16,000 and to do so as quickly as possible.

continued on page 3

NOTES, REPORTS, AND ANNOUNCEMENTS

AIP Center of History of Physics (CHP) Activities

Nearly two-dozen new links added to the CHP page of web resources for history of physics, astronomy & geophysics: www.aip.org/history/web-link.htm (See the “new” box near the top.) The links point to fine new biographical exhibits, timelines, and sites on special topics ranging from the 18th-century Venus transits to the Van de Graaff generator.

The Fall 2004 issue of the AIP *History of Physics Newsletter* is now online: www.aip.org/history/newsletter/fall2004. You can browse the web version or download a PDF. Includes articles on an initiative to designate historic physics sites, progress in plans for the Year of Physics 2005, preservation of source materials at MIT, Strasbourg, Bristol University and elsewhere, our bibliographies of recent books and articles, and more.

If you receive a paper copy of this *Newsletter*, you may want to switch your subscription to online-only. This will leave us more money for our programs and projects, and you can see the *Newsletter* as soon as it's issued—with active links and some of the pictures in color! E-mail us at chp@aip.org including your name and address and the phrase “stop mailing paper” (or words to that effect).

Below is our regular grant-in-aid announcement, which we trust will be of interest to readers of the APS Forum's *History of Physics Newsletter*:

AIP Center for History of Physics Grants-in-Aid for History of Modern Physics and Allied Fields (Astronomy, Geophysics, etc.)

The Center for History of Physics of the American Institute of Physics has a program of grants-in-aid for research in the history of modern physics and allied sciences (such as astronomy, geophysics, and optics) and their social interactions. Grants can be up to \$2,000 each. They can be used only to reimburse direct expenses

connected with the work. Grants will be given only to reimburse: (1) expenses for travel and subsistence to use the resources of the Center's Niels Bohr Library in College Park, Maryland (easily accessible from Washington, DC), OR (2) expenses including travel and subsistence to tape-record oral history interviews or microfilm archival materials, with a copy for deposit in the Library. Applicants should suggest the persons they would interview or papers they would microfilm, or the collections at the Library they need to see; you can consult the online catalog at our website, <http://www.aip.org/history>, and please feel free to make inquiries about the Library's holdings.

Applicants should either be working toward a graduate degree in the history of science (in which case they should include a letter of reference from their thesis adviser), or show a record of publication in the field. To apply, send a vitae, a letter of no more than two pages describing your research project, and a brief budget showing the expenses for which support is requested to:

Spencer Weart
Center for History of Physics,
American Institute of Physics
One Physics Ellipse,
College Park, MD 20740
Phone: 301-209-3174,
Fax: 301-209-0882
e-mail: sweart@aip.org.

DEADLINES for receipt of applications:
APRIL 15 and **NOVEMBER 15** of each year.

Inaugural Cushing Memorial Prize Awarded to Hans Halvorson

The Graduate Program in History and Philosophy of Science at the University of Notre Dame and the Cushing Memorial Prize Advisory Committee are pleased to announce the award of the first Cushing Memorial Prize to Professor Hans Halvorson of the Department of Philosophy, Princeton University, for his paper:

“Reeh-Schlieder Defeats Newton-Wigner: On Alternative Localization Schemes in Relativistic Quantum Field

Theory.” *Philosophy of Science* **68** (2001), 111-133.

The \$1,000 prize was awarded on Friday, September 3, 2004 in conjunction with Professor Halvorson's delivering at Notre Dame an invited lecture under the title, “No Eliminative Materialism, No Quantum Measurement Problem.”

The Cushing Memorial Prize is awarded annually for the best work by a younger scholar on the history and philosophy of physics. The prize honors the memory of the late James T. Cushing (1937-2002), long-time professor of physics, philosophy, and the history and philosophy of science at the University of Notre Dame. The prize is administered by Notre Dame's Graduate Program in the History and Philosophy of Science with the assistance of a distinguished international advisory committee composed of Professor Cushing's students, friends, and professional colleagues

The next winner will receive \$1,000 and an invitation to deliver a paper in Notre Dame's History and Philosophy of Science Colloquium series during the 2005-2006 academic year. Eligible are all papers in the history and philosophy of physics published by a younger scholar within the three years prior to the nomination (e.g., for the 2004-2005 competition, no earlier than September, 2001). Work is eligible only by nomination. While we offer no explicit definition of the term “younger scholar,” our intention is to favor work produced by scholars who are no more than about five years past the completion of the Ph.D. or, in a comparable way, new to the fields of the history and philosophy of physics, in recognition of Jim's well-known role as a nurturer of younger talent in the profession.

A nomination should consist of a brief description of the significance of the nominated work and such information about the author as the nominator might think helpful to the evaluation committee, such as an abbreviated *c.v.*

Cushing Memorial Prize Nominations
History and Philosophy of Science
Graduate Program,
346 O'Shaughnessy

continued on page 12

NOTES, REPORTS, AND ANNOUNCEMENTS

continued from page 12

University of Notre Dame,
Notre Dame, IN 46556
By fax: 574-631-7418
For further information, see <http://www.nd.edu/~cushpriz/>

—During the **XXIIth INTERNATIONAL CONGRESS FOR HISTORY OF SCIENCE** (Beijing 24th-30th July 2005) the commission of History of Modern Physics of the IUHPS/DHS will organize a session “Einstein in Context: Perspectives on Einstein as Icon, Public Figure and Political Man” Interest in this meeting (including offers for papers) should be addressed to its organizer:

Prof. Dr. Helge Kragh
(University of Aarhus, History of Science Department, Building 521, DK-8000-Aarhus;
e-mail: ivhkh@phys.au.dk)

or

Prof. Dr. Dieter Hoffmann
(MPI for the History of Science)
Wilhelmstraße 44, D-10117 Berlin;
e-mail: DH@mpiwg-berlin.mpg.de)

XIth Meeting on History of Physics

The Division for History of Physics of the German Physical Society will hold its 11th Meeting on History of Physics. This meeting is part of the annual meeting of the German Physical Society and will be held in Berlin from March 7th through 9th 2005. The topic is ‘ “Pure Genius?” “Great Discoveries” and “Everyday” Science.’ It should discuss the relation between “great discoveries” and “great men” and “everyday” research, results and persons in the history of physics. Paper proposals with a short abstract and interest in this meeting should be addressed to its organizer:

Dr. Beate Ceranski
(Universität Stuttgart, Lehrstuhl für Geschichte der Naturwissenschaften und Technik, Keplerstraße 17, D-70174 Stuttgart;
e-mail: beate.ceranski@po.hi.uni-stuttgart.de) or

Prof. Dr. Dieter Hoffmann (MPI for the History of Science, Wilhelmstraße 44, D-10117 Berlin;
e-mail: dh@mpiwg-berlin.mpg.de)

HELP GROW YOUR FORUM

FHP benefits in lots of ways when more people join—better attended sessions; more contributed talks and posters; more people to help on committees; and more money back from APS into our treasury. We could double by following the “each one teach one” model of literacy promotion, that is, if every current member enrolls one suitable colleague who is already an APS member (or who is interested in joining—also a good thing). Members can be added in groups by passing sign up sheets when you speak someplace where there are physicists with some interest in history (16 at the most recent AAPT meeting). Please urge a colleague to join this week, and collect a cohort next time the opportunity arises. Correctly spelled names of new members can be sent to our secretary, Ken Ford, kwford@verizon.net.

—V. Trimble, *Vice Chair*

IMAGES OF SCIENTIFIC GENIUS: JOINT ATLANTIC SEMINAR FOR THE HISTORY OF THE PHYSICAL SCIENCES (JASHOPS) 2004-2005 February 4-6, 2005 University of Notre Dame

The History and Philosophy of Science Graduate Program at the University of Notre Dame is hosting the 2004-2005 meeting of JASHOPS—The Joint Atlantic Seminar for the History of the Physical Sciences.

2005 is the International Year of Physics (IYP). In keeping with the spirit of the IYP, the 2004-2005 JASHOPS meeting is taking as its main theme “Images of Scientific Genius” and will feature as its keynote speaker on Friday, February 4, John Stachel, Emeritus Professor of Physics at Boston University and the first editor of The Collected Papers of Albert Einstein, speaking on the topic, “Einstein’s Miraculous Year.”

For further information, please visit the conference website: <http://www.nd.edu/~hps/JASHOPS.html>

UC Berkeley’s **OFFICE FOR HISTORY OF SCIENCE AND TECHNOLOGY** has several physics-related projects underway. In April 2004, OHST headed up Berkeley’s program for the hundredth anniversary of J. Robert Oppenheimer’s birth. To

mark the centennial, OHST hosted a two-day conference for scholars and the general public. The events were headlined by historian Daniel J. Kevles and coordinated with a commemoration in the Department of Physics and exhibits on the history of physics in the Library. The conference papers will be published in 2005 in the Office’s book series. In the meantime, a biographical website “J. Robert Oppenheimer: A Life” (<http://ohst.berkeley.edu/Oppenheimer/exhibit/>) makes his story accessible to the public. *Scientific American* has recognized the exhibit with a 2004 Science and Technology Web Award. The centennial events also resulted in a long-overdue honor: a pedestrian mall on the campus next to the Physics Department will be officially designated “J. Robert Oppenheimer Way.”

OHST is pursuing other physics-related ventures. Even before the Oppenheimer volume, the Office will publish a collection of essays on Michael Frayn’s award-winning play *Copenhagen*, dramatizing the 1941 encounter between Heisenberg and Bohr. The essays are written by historical experts of every persuasion and accompanied by original documents. The volume will appear in late fall 2004. Locally, the Office is working together with Berkeley’s Bancroft Library, which has a rich collection of sources on physics. A database and online search tool will soon go live to guide researchers to historical documents for the history of science and technology in all Berkeley’s archives. The database incorporates electronic records of OHST’s copy of the Archive for History of Quantum Physics (which was physically quartered in Berkeley). Over the next years, OHST will also be developing a website on local nuclear history, titled “Nuclear Berkeley, Nuclear World.”

The Office has many ongoing activities. In coordination with Berkeley’s graduate program in the history of science, it runs a biweekly lecture series with UC San Francisco’s program in the history of health sciences. The Office frequently hosts visiting scholars, and it produces the journal *Historical Studies in the Physical and Biological Sciences*. All these activities and more are described on its website <http://ohst.berkeley.edu/>. For information contact OHST’s director, Cathryn Carson <clcarson@socrates.berkeley.edu>.

BOOK REPORTS

Kitty Ferguson. *Tycho & Kepler: The unlikely partnership that forever changed our understanding of the heavens.* Walker and Company, New York, 2002. (paperback) Reviewer: Virginia Trimble, University of California, Irvine

Have you heard the tales of Tycho's metallic nose job and embarrassing death, of the trial of Kepler's mother for witchcraft and his denial of Tycho's dying request? Well, so has author Ferguson, and she has chased them down and can report that they are all roughly true, though you will have to go to another book to find out which bit of the nose had been sliced off in the duel. She has provided a fascinating discussion of both "life" and "works", and probably for the intended audience of non-scientists both are completely satisfactory.

For an astronomer, this one at least, the "life" sections contain far more new information, for instance on "the courtship and marriage customs of late sixteenth-century Denmark" (p.176 ff). Tycho had chosen a partner from well below his own, noble, social class, rendering the marriage doubtful in Denmark, the status of the children marginal, and so the second generation of marriages complex to arrange. And, yes, it is possible to quibble with some of the astronomy, both ancient (equants and all) and modern (supernova types for instance).

In many places, I wanted to say to the author, "Tell me more!", and this is a book to read with a library around you. Did Newton mean Copernicus, Kepler, and Tycho when he spoke of standing "on the shoulders of giants?" Don't trust me; read Robert K. Merton's "On the Shoulders of Giants" (Chicago 1993 and other editions). Was it reasonable of Tycho, approaching 40, to think his years nearly over (or the author to say so)? Look at the birth and death dates of his contemporaries in Michael Hoskins's "Cambridge Illustrated History of Astronomy" (CUP 1997). Three indeed died in their late 30s and one in his 40s, but six in their 50s, three in their sixties, and six in their seventies (including, of course, Galileo of paternal memory).

Was Jacob married to Rebecca (p.102)? Well, not the Jacob and Rebecca I first thought of and the author seems to

have had in mind, unless "He loved his mother" (Read the Old Testament, and, while you are at it, listen to Tom Lehrer). Where was the Silesian Duchy of Sagan, in which Kepler spent a few unhappy years from 1627 (p.353), and could Carl's family possibly have come from there? It's now on the Czech-Polish border (thanks, Rand McNally!). As for the family, physics texts abound with names for which that guess would be wrong—Fritz London comes to mind.

What does it mean that Tycho produced the finest poem ever written in Latin by a Dane (p.112)? I was reminded of one musician describing another as "the world's greatest living Jewish organist...well, he's just about the only..." but could not think of a ready source on Latin poems written by Danes.

Kepler and Tycho each have an eponymous supernova, awarded for discovery in Tycho's case and detailed study in Kepler's, but can it possibly be true that Europeans completely missed the much brighter event of 1006? Well, no (F.R. Stephenson and D.A. Green "The Historical Supernovae and their Remnants", a 2002 updating of the earlier Clark & Stephenson). But they did miss 1054 it seems. For that matter, why do we say Tycho and Kepler, rather than Brahe and Johannes? Beats me!

For more about Katharina Guldenmann Kepler's life as a witch, there is James A. Connor's "Kepler's Witch" (Harper San Francisco 2004), and for the significance of Johannes's smallpox-damaged eyesight and involvement with the early development of the telescope, there are Kepler's own words, annotated by Dennis R. Danielson in "The Book of the Cosmos" (Perseus Publishing, 2000, p.163-169).

What else will you want to hand? Surely Owen Gingerich's "The Book Nobody Read" (Walker & Co. 2004), where you will find the missing piece of nose on p.115. Gingerich's book concerns Copernicus's *De Revolutionibus*, which was in fact read by some hundreds of copy-owners as nitpickingly as I have read Ferguson's book. And a good scientific biography of Newton, about which I would not presume to advise, but will just leave you with the thought that, for all his intellectual skills, he twice bought into the

South Sea Bubble, a factoid instructing his agent the second time around which appeared several years ago culled not from a recognized biography, but from a photograph of the document in the sales catalog of R.M. Smythe auctioneers. Ferguson, incidentally, enthusiastically acknowledges a great deal of assistance with both history and details of Ptolemaic, Copernican, and Keplerian orbits from Gingerich, so that Gingerich's volume is not entirely an independent source.

Ferguson makes the important point that part of Kepler's genius was in asking questions that others thought were too obvious to bother with. I've long said the same about Newton, and the point is surely not original with either of us. Your homework for the weekend is to think of other examples.

Harry Collins, *Gravity's Shadow: The Search for Gravitational Waves,* Chicago, The University of Chicago Press, 2004. Reviewer: Judah Levine, University of Colorado

The book is divided into several sections: The first is an introduction, which identifies the three communities that are involved in any science project: (1) the core scientists who are directly involved in the research project; (2) scientists in other areas and project managers at funding agencies, who are not practicing scientists although they often have a scientific background, and (3) the lay public, who learn about science through the news media. The second section describes the history of gravitational-wave bar detectors, from the initial work by Joseph Weber and his associates to the ongoing work by a number of groups in the US and Europe. The third section focuses on gravity-wave detectors based on optical interferometers, primarily the LIGO (Laser Interferometer Gravitational-Wave Observatory) project, but also the similar projects in other countries. The discussion includes the relationship to the bar groups, the beginnings of LIGO as "small science" and its somewhat painful transition to a large multi-million dollar enterprise. The final section contains a discussion of science, scientists, and sociology

continued on page 14

Book Reports

continued from page 14

and the interactions between the scientists who are involved in a project and the sociologist/author who is observing their work. The discussions on science and sociology are the most generally interesting parts of the book, and they will be thought provoking even for readers who are not concerned with the details of the gravitational wave story, which makes up most of the text.

In general, the book is very well written, and contains many interesting and useful insights into the nature of science and scientists. I know most of the scientists in the story, and I found Prof. Collins' descriptions of them to be accurate and well-balanced. I could picture Joe Weber and Ron Drever from his writing as clearly as if they were sitting in my office, and I was impressed at how well he has captured many of the nuances of their stories.

However, I do not agree with everything in the book. For example, I think that Professor Collins makes more out of "scientific trust" than I would have done. It is true that trust is a necessity in modern life, but a good experimentalist minimizes the number of things that must be taken on trust by testing his apparatus using as many independent methods as he can think of. The results of these tests and evaluations are often reported independently as contributing to a "type B" uncertainty in addition to the "type A" uncertainty derived from statistics. I don't agree with Professor Collins when he writes (p.5), "And think how easy it would be to fool everyone, including the scientists, into thinking that a gravitational wave had been found." The number of "core" scientists who are experts in all aspects of a gravitational-wave detector may be rather small, but the world has many experts on seismic isolation, electronic servos, optical interferometry, statistical analysis, real-time computer programming, and all of the other myriad aspects of an experimental program whose goal is to search for gravitational waves. Fooling all of these experts simultaneously would not be easy. More generally, the opinions of the experts in the many technical aspects of an experiment make an important contribution to the trust in the experimental result, even when these experts are not necessarily knowledgeable about the primary objective of the program.

Professor Collins might consider adding an additional category to figure Intro.1 to recognize these contributions.

Professor Collins spends chapter 27 trying to explain the shift in the funding support from the bars to the interferometers. I think he underestimates the flexibility, frequency agility, and adjustable bandwidth of an interferometer over even an ensemble of co-located bars or spheres. (As a practical matter, realizing this flexibility without compromising the signal to noise ratio of the device is not trivial and will require signal analyses using multiple signal templates. Therefore, the signals from a sufficiently sensitive spherical detector might be used as a trigger for concentrating the analysis efforts.) I think he also misses the importance of the "sex-appeal" of LIGO to this decision. (It is hard to define scientific "sex-appeal" beyond the usual "I know it when I see it.") I think LIGO has lots of it, and the bars and spheres do not. A project with "sex-appeal" is often enhanced if it has great technical difficulties. These difficulties provide ample opportunities for experimentalists to devise clever solutions, and the solutions to complex technical problems can be used by funding agencies to justify the project even if its principal goals are not met. On the other hand, a project that lacks sex-appeal is degraded by technical difficulties, which are too often seen as indicators of failure. Life is not always fair.

Professor Collins is correct that the construction of LIGO has put the operating mechanical detectors in a race against time—if the goal is to be the first to detect gravitational waves unambiguously, they must do so before advanced LIGO (or, under very favorable circumstances, the initial LIGO) becomes operational on a routine basis. If there is a significant delay in realizing the design goals of advanced LIGO, then it is possible that LISA, a space-based system to detect gravitational waves, may make the first unambiguous detection. (The LISA system is better equipped to detect low-frequency, periodic sources. Although the signals from these sources are likely to be quite weak compared to impulsive events, their characteristics are well known from other data, and it should be straightforward to make

a convincing case when these signals are seen.)

There are two issues that I would have liked to see discussed in greater detail. The first is the political aspect of the choice of the LIGO site in Louisiana, which Professor Collins recognizes was chosen based, at least to some extent, on political considerations (p.538). It is certainly naïve to think that Congress would appropriate several hundred million dollars without adding some strings to the money, but Professor Collins seems less concerned about this process that I might have been in his position. Will the community be well-served if the cultural noise at the Louisiana site turns out to be a significant limitation on the performance of the system? If disinterested outsiders do not ask these questions, who will?

The second aspect is the treatment of Joe Weber both by the funding agencies and by the scientific community after his discoveries had been generally discounted. Professor Collins discusses this in some detail, and returns to it in the last chapter of the book (ch.44), but a more general discussion would be useful. There are many scientists whose work has been discounted by most of the scientific community, even though no one can show definitively how and why their results are wrong. Joe Weber was an experimentalist, and many of the arguments against his results were based on general considerations such as the very large number of events, the signal to noise ratio of his detectors, the residual background noise, and related considerations. What about a theorist, whose calculations are not so easily judged and cannot be so easily dismissed in this way? Or, consider an experimentalist whose methods are conventional but whose results are considered wrong, even though no one can say why? Resources are finite, and not every far-out idea can be supported, but how and where do we draw the line?

Book Reports

John Waller. *Einstein's Luck: The Truth Behind Some of the Greatest Scientific Discoveries.* (Oxford University Press, Oxford, 2002) xi +308 pages, notes on sources, index, and black and white figures, ISBN: 0-19-280567-3, \$15.95, paper. *Reviewer: Allan Franklin, University of Colorado*

Einstein's Luck tells us interesting stories about some discoveries in physics, medicine, biology, and management science. My only problem, discussed in detail below, is that I don't really know if the author is telling me the truth. In the three episodes in which I know something about the history the author has made errors, distorted the history, and omitted evidence that doesn't support his story. Ironically, that is just what he accuses scientists and other historians of doing.

Waller remarks that "the aim of this book has not been to denigrate science. Rather my chief targets have been an overly simplistic reading of what science is all about and the strong tendency to romanticize its past achievements (p.294)." He also believes that his work does not "undercut the status that modern science deservedly enjoys as the best way of increasing our understanding of the physical world. (p.7)." I tend to believe him, although the tone of some of his chapters might indicate otherwise.

In a short review such as this I cannot discuss all of the problems with Waller's accounts so I will concentrate of the episode I know best: Robert Millikan and the charge of the electron. Waller states that his essay is based on two essays, one by Gerald Holton (1978. "Subelectrons, Presuppositions, and the Millikan-Ehrenhaft Debate." *Historical Studies in the Physical Sciences* 9: 166-224) and one by myself (A. Franklin, 1981. "Millikan's Published and Unpublished Data on Oil Drops." *Historical Studies in the Physical Sciences* 11: 185-201). It is clear that Waller has not read my work very carefully. He gets most the history of Millikan's exclusion of data correct and notes that Millikan had good reasons for most of his exclusions. He also notes that there was an ongoing controversy between Millikan and Ehrenhaft concerning the question of charge quantization and

he attributes most of Millikan's sins (his word) to a desire to avoid giving Ehrenhaft ammunition in that controversy. Waller regards three excluded drops as his most significant evidence for this. The first of these drops occurred on March 7, 1912. Waller states that Millikan calculated a value of $e=1.915 \times 10^{-10}$ esu for this drop, which differed dramatically from his average value of 4.778×10^{-10} esu. He also notes that no one has yet offered an explanation of this event, including Millikan. The truth is, as I stated explicitly in my original article, that Millikan performed no calculations on this drop. A point that Waller omits is that Millikan had far more data than he needed to reduce the uncertainty in e by an order of magnitude. In fact, Millikan used only 23 of his published 58 events in determining his final value, those for which the Stokes' Law correction needed was less than six percent. The second event is one for which neither Millikan nor I could obtain consistent results. Waller states that Millikan obtained a value for e significantly lower than his average. Once again, Waller is simply wrong. Neither Millikan nor I calculated a value of e for this drop. The time measurements for this drop are inconsistent and there is a serious calculational error. The whole data set for this drop was unreliable.

The third drop does support Waller's view. It occurred on April 16, 1912, not March 7 as Waller states. This event, which was among the most consistent of Millikan's measurements gave a value of about $0.6 e$. Millikan wrote "Won't work" in his notebook and never mentioned it, I suspect to avoid giving aid to Ehrenhaft. Later work by Bill Fairbank Jr. and myself (W.M. Fairbank Jr. and A. Franklin 1982. "Did Millikan Observe Fractional Charges on Oil Drops?" *American Journal of Physics* 50: 394-397), and not mentioned by Waller, found that because of space-charge effects and field inhomogenities that Millikan's apparatus was unreliable for total charges on the oil drops of greater than $30e$. A rough estimate of the charge on this drop is greater than $50e$.

There are other difficulties with Waller's account of Millikan and with his discussions of Eddington and the eclipse expedition of 1919 and of Pasteur's

experiments on spontaneous generation that require more space to discuss than I have here. These are the three episodes in which I know something of the history. Although the accounts of the discoveries are fascinating and easy to read, I fear they are untrustworthy. I do not recommend this book.

Light Is A Messenger; *The Life and Science of William Lawrence Bragg.* Graeme K. Hunter. Oxford University Press. (2004;301pp.) *Reviewer: Frederick Seitz, Rockefeller University*

William Lawrence Bragg is particularly well known for his pioneering work in determining the arrangement of atoms in crystals and molecules with the use of methods of x-ray diffraction that he had for the most part developed himself following the discovery of such diffraction, on a brilliant hunch, by a small team working under the direction of Professor Max von Laue at the University of Munich. Actually Bragg had a highly diversified career, in keeping with his many talents. He was born in New Zealand in 1890. His father, William Henry Bragg (WHB), had held the chairs of mathematics and physics at The University of Adelaide since 1886, after graduating from Trinity College, Cambridge, where he had distinguished himself in the two fields.

Young Charles, the first of three brothers, was highly precocious and soon out-paced fellow students in the schools of Adelaide in most fields of study, including the sciences and humanities.

Although the senior Bragg had found little time or inclination to carry out research on arriving in New Zealand, his burdens became lightened with the addition of a staff member and he found the time to become interested in the discovery of x-rays and natural radioactivity. He began to measure the ranges of the emanations and wonder about the nature of x-rays. Correspondence with Rutherford led to a warm friendship between the two and eventually resulted in an offer of the Cavendish Chair in Physics at the University of Leeds to the elder Bragg, which he accepted. In the meantime he was elected to the Royal Society of London.

continued on page 16

Book Reports

continued from page 15

The family moved to England in 1909. By 1910, the younger William Bragg had been accepted by Trinity College and granted a fellowship in mathematics, but he switched to physics in the next year. When news of the discovery of x-ray diffraction reached England in 1912, it caused considerable excitement. For one thing it settled the long debate about the wave versus particle nature of x-rays. Beyond this, however, was the as yet unresolved question of what the observations had to say about the arrangement of atoms in the diffracting crystal. Young Bragg took this on as a major challenge, joined with full enthusiasm by his now re-invigorated father. Many young members of the staff at the Cavendish also joined in the creative excitement. The rest is scientific history. Father and son were jointly granted the Nobel Prize for 1915. The Cavendish soon became a world center for structural analysis.

The major portion of this excellent

book presents details of Bragg's extended career, which can only be summarized in this brief review: He joined the British artillery in 1914 and, with others, successfully introduced sound-ranging in 1915. He returned briefly to Cambridge in 1919, but became Rutherford's successor in physics at the University of Manchester; He resumed extensive research in x-ray analysis after adjustments in departmental structure were made. He began scientific travels, visiting Massachusetts and California in 1928. He accepted the prestigious post as Director of the National Physical Laboratory in 1937, but left the position in 1938 to become head of the Cavendish Laboratory. He was knighted in 1941. During WWII he served on various advisory committees and, briefly, as head of The British Scientific Liaison office in Canada. His last position, which he accepted in 1952, was a head of the Royal Institution, from which he retired in 1965 after inducing significant changes.

Fermi Remembered, edited by James W. Cronin Published by University of Chicago Press, 2004 *Reviewer: Gaurang B. Yodh, University of California Irvine.*

I am often asked, what was it like to work with Fermi, how did he interact with his students, was he approachable, did he have interests other than physics? "Fermi Remembered" is a wonderful resource on Enrico Fermi which provides different insights into such matters and his scientific contributions through the perceptions of colleagues, students and others who interacted with him. Some twenty seven individuals (eight Nobel Laureates) have contributions in this volume which celebrates the 100th anniversary of Fermi's birth. The main emphasis is on Fermi's years in America.

Fermi was probably one of the last of the physicists who were equally able to deal with theory and experiment and pushed the frontiers in both realms. In his article "Fermi and the Elucidation of Matter", Frank Wilzcek says "Fermi loved his dialogue with nature...crafting important questions that we can answer definitely... in this art Fermi was a natural grand master, and worthy heir of Galileo "...Wilzcek focuses on continuing impacts of Fermi's major contributions: the Fermi gas which involves generalization of Pauli exclusion principle, quantum field theory of beta-decay in which he took Pauli's neutrino seriously and literally, and attempted to construct an appropriate quantum field theory which provided the basis of investigations of the neutrinos themselves and speculated with Yang on possible compositeness of the pion.

Cronin, has documented in one place original letters and documents pertaining to the development of nuclear energy, including correspondence with Leo Szilard, with C.N. Yang on the question of what is elementary, with Clyde Cowan and Fred Reines on their experiment to detect the neutrino and with Sam Goudsmit about use of isopin or isotopic spin in scientific literature. There are representative reproductions of Fermi's notebooks including calculations about stochastic acceleration of cosmic rays and listing of problems

Candidates' Statements

continued from page 8

Mössbauer History Day celebration she co-sponsored with Argonne physicists.

Westfall holds an adjunct professorship in the History Department at Michigan State University and has taught a variety of courses in the history of science. Most recently she taught a history of physics survey course in the MSU Physics Department.

She is a member of the American Physical Society, the History of Science Society, and the Society for the History of Technology. She has been instrumental in organizing a series of conferences for physicists and historians interested in the history of laboratories, and she is the program chair for the fourth conference in the series to be held at the University of British Columbia in 2006.

Statement: Trained as a historian, I have always worked closely with both physicists and historians of physics to uphold and reinforce the highest scholarly standards of both fields. I would bring this commitment and interdisciplinary perspective to my work on the Executive Committee.

Using my background, experience, and contacts, I would focus in particular on drawing together scholars from a variety of backgrounds to study and discuss the struggle to solve nature's physical mysteries. Since I think it's particularly important that the achievements of older physicists be recognized and that younger physicists come to understand their intellectual heritage, I would focus in particular on finding ways to draw young people to all Forum activities, but especially those aimed at celebrating the many and varied contributions of physicists.

BOOK REPORTS

which his theory does not explain.

There are personal reminiscences of colleagues, students and students of the Fermi period who did research with his group, which provide a comprehensive view of Fermi, his work, his character, his warmth and his scientific insights.

Richard Garwin, who was Fermi's student as well as a colleague, illustrates with several examples Fermi's ingenuity in tackling both experimental and theoretical problems. Murray Gell-Mann tells about the time Fermi audited his class on particle and fields and asked a seminal question about neutral spin zero particles which helped him in his paper on neutral K particle situation. Murray tells of their visit to Fermi in the hospital in his last days, where Fermi said to Yang and Murray "Now it's up to you." Marvin Goldberger's reminiscences of Fermi during his Chicago years is the most comprehensive of the articles in this book. He describes him as "The complete Physicist" Fermi showed his students that "Physics is to be built from the ground up, brick by brick, layer by layer". Regarding Fermi's lecturing style Goldberger states that his courses were carefully organized and interesting, however when you tried to solve problems yourself you found "If you don't happen to be Enrico Fermi not all problems are easy" Fermi was a great teacher.

When it came to research, he showed by example. Darragh Nagle describes Fermi in Columbia and Chicago and the pion physics experiments that we did in the early 1950s. Valentine Telegedi in his short presentation has a wonderful definition of 'What did make Fermi special "his universality as a physicist, his man on the street mannerism and his frugal lifestyle."' Harold Agnew talks about Fermi's athletic abilities, his competitiveness in sports, his special liking and interaction with young people, of the generosity of the Fermis and of their regular parties in which younger colleagues and students were an important contingent. Geoffrey Chew describes Fermi's intensive interactive training of his graduate students on a regular basis. He points out that to Fermi, the relation between theory and the physics meaning of truth was based on the Galilean idea of reproducible experiment. In his remembrances, T.D. Lee tells how Fermi

helped him to make a special slide rule to do radiative transfer calculations. He also describes how Marshal Rosenbluth, Yang and himself, developed the ideas of a universal Fermi interaction and an intermediate heavy boson to mediate the interactions in analogy with electromagnetism and how Fermi insisted that they publish their ideas. Jay Orear tells of how Fermi met him at a course he took on 'Square dancing' and Fermi's real pleasure in this form of social dancing, as well as Fermi's interest in the sport of ice skating. Arthur Rosenfeld got Fermi to read the book, *The Hydrogen Bomb* by James Shepley and Clay Blair in 1954 which made Fermi sufficiently upset to agree to hold a news conference to let the public know his views of the "damn book."

Jack Steinberger considers his years at Chicago "the most satisfying time in my privileged life." Nina Byers was hired by Leo Szilard, in 1953-54, to tell him about Fermi's studies of pion-nucleon interactions at the Chicago cyclotron. She was fascinated to learn from Fermi's lectures on pion physics and be exposed to Szilard's questions. She describes Fermi-Szilard interactions after both came to the states. Jerome Friedman, who started as a Fermi student remembers that whenever Fermi's office door was open, students could go in and see him and get an explanation of any aspect of physics that needed clarification. Rosenbluth's account of the animated discussion, during his thesis defense, between Edward Teller and Enrico Fermi about the state of modern particle physics shows physics at its best. C.N. Yang's article describes Fermi's early contributions to physics in a clear and succinct manner and also contains some personal stories about Fermi. Fermi's application of his statistical model for particle production at high energies to explain the highest energy event in 1949, the Schein star, is described by this reviewer in the last reminiscence in the book. He tells about Fermi's enthusiastic participation in annual physics Christmas parties and ends with two stanzas of a Nobel prize song composed by Arthur Rosenfeld which delighted Fermi.

Fermi's vision of the future is the theme of the last chapter, which has excerpts and figures from his address as retiring president of the American Physical Society, including a sketch

of the 'Globatron'. He did not live to see our modern accelerators and the development of the standard model of particle physics.

The Born-Einstein Letters: Friendship, Politics and Physics in Uncertain Times Published by Macmillan Science, *Editor: Sara Abdulla.*

Albert Einstein and Max Born were great friends. Their letters span 40 years and two world wars. In them they argue about quantum theory, agree about Beethoven's heavenly violin and piano duets (which they played together when they met) and chat about their families. Equally important, the men commiserate over the tragic plight of Europe's Jewry and discuss what part they should play in the tumultuous politics of the time. Fascinating historically, *The Born-Einstein Letters, 1916-1955* is also highly topical: scientists continue to struggle with quantum physics, their role in wartime and the public's misunderstanding. First published by Macmillan in 1971, this book is re-issued with its original material from Werner Heisenberg and Bertrand Russell and a substantial new preface from Diana Buchwald and Kip Thorne as part of 2005's Relativity Centenary celebrations. Note on New Edition by Gustav Born.

Eurekas and Euphorias, The Oxford Book of Scientific Anecdotes, Walter Gratzer, Oxford University Press 2004

This is a potpourri of brief anecdotes concerning a variety of topics in science intended to enlighten and amuse. It covers 181 events; some of great moment, e.g., the discoveries of insulin and penicillin, important matters involving Rabi, Otto Stern, Feynman, Millikan, etc., some completely trivial incidents, and some examples of pathological science, recycled from Gratzer's earlier book *The Undergrowth of Science*. With only 350 pages in this new paperback edition (the original hardcover appeared in 2002), this averages to only about two pages per incident. This is like being caught in a candy store after hours—provided you don't overeat you can have great fun sampling. Perfect for taking on an airplane. —B Bederson

Letters to the Editor

To the Editor:

The APS meeting last March held a session on the History of Physics in Canada. I was not able to attend that meeting but I have read several reports about it, including some items in the latest “*History of Physics Newsletter*” of the Forum of the APS. This has led me to think there might be some interest in my family experience in that area. It so happens that I and my paternal antecedents lived in Canada for some 150 years, having emigrated from New Jersey, where they had resided since 1635. In 1786 my ancestor Daniel Pound was both a Quaker and a veteran of the British forces, and so became a United Empire Loyalist qualifying him for a land grant in Upper Canada, settling there in the Niagara Peninsula. My father, Vivian Ellsworth Pound, studied physics and mathematics at the University of Toronto, class of 1907. He continued there as a graduate student and Demonstrator in Physics, working on the newly discovered natural radioactive materials with J. C. McLennan (later Sir John). My father was awarded a Ph.D. in 1913 for his thesis submitted in 1912 entitled “The absorption of different types of beta rays together with a study of the secondary rays excited by them. On secondary rays excited by the alpha rays from polonium.” Some years ago I found a copy of this work shelved in Harvard’s Widener Library next to items by Rutherford, Soddy and other early students of radioactivity. Publications in those days were in the *Philosophical Magazine* in the UK. My father’s was the fourth Ph.D. in physics to be awarded by the University of Toronto, the first being to McLennan himself in 1900. At the time they were of course aware of competing with Rutherford then at McGill in Montreal in studying radioactivity.

When I was growing up my father told me about McLennan going out in small boats on Lake Ontario, known to be a relatively deep lake, to see if its depth would reduce the radiation coming from the deep mineral deposits common to Ontario, and perhaps causing the observed atmospheric ionization. His negative findings were a step toward the later [Victor Hess’s] discovery from balloon flights that the ionization came from above, as cosmic rays. He told

me that McLennan always took along an ionization chamber on his frequent summer Atlantic crossings to England, for the same purpose.

My father left Toronto to join Queens University in Kingston in 1913, where he was offered \$100 a year higher salary, a help in his marriage. There as well as teaching he continued his research in radioactivity, but found it difficult to produce adequate vacua with the pumps then available to him. An article in “*Physics in Perspective*” Vol. 2, (2002), describes the concerns of William Wilson, an assistant to Rutherford at Manchester, in responding to an offer from J. C. McLennan at Toronto for a position at \$1250p/a. This Wilson was working in research similar to that of my father and it appears as if the offer would be to replace my father after he had gone to Kingston. Rutherford spoke favorably of McLennan and recommended that Wilson take the job, which apparently he did. Evidently he soon moved on, however, to industrial work in the US. The story illustrates what I used to hear about as a concern of the young Canadian academics at the time, namely that salaries were kept low by the availability of young English “second sons” and the like for the cheap, who were happy to gain experience in the provinces. In view of current relationships with Canada and the border it may be amusing to note that, as an Officer in the Canadian Army Reserves, my father was ordered to patrol the waterfront on Lake Ontario at Kingston on the night of January 18, 1915, whilst my mother was giving birth to my oldest sister. He was sent out to intercept anticipated German espionage agents possibly infiltrating by crossing the lake on the ice from the “neutral” USA. The story persisted in our family because my mother vaguely remembered noticing a man in a dark uniform leaning over her sometime during her night of labor.

My father’s role at Toronto wasn’t noticed in a history of Physics at the University of Toronto that I was shown on a visit some years ago beyond listing his name as number four in the catalogue of Ph.D.s awarded from the beginning in 1900. Recently I was questioned by someone writing a new history, because it was noted that I and V. E. Pound both were named in some archives of the University of Buffalo.



Figure 4. Vivian Ellsworth Pound

It seems that, because his given first name was Vivian, they had begun thinking him to be the first female Ph.D. at Toronto, but I was told they soon found a photograph in his 1907 year book which straightened them out. I also sent them a copy of a photo of him in his Ph.D. regalia in 1913 (see above). From what I understand, my father and his work were quite important to McLennan in those early years studying radioactivity, and I was surprised to find so little attention paid to those years in the written history of physics at the University of Toronto. One evening some years ago I took Sir George Thomson to dine as a guest at our Harvard Society of Fellows and I mentioned that my father had worked with radioactivity for more than 10 years in those early days and he seemed to have been luckier than some in avoiding damage to himself from radiation. Sir George then told me he remembered my father and his work at Toronto. When I mentioned this recollection to my father he told me about being asked by McLennan to come to the lab in the summer of 1909 because there was to be a visit there by Sir J. J. (Thomson). My father remembered that J. J. was accompanied by his then 16 year old son, George. J. J.’s visit to Winnipeg in 1909, as President of the British AAS, is described

FHP OFFICERS 2004-2005

Chair: Nina Byers,
Chair-Elect: Robert Romer,
Vice Chair: Virginia Trimble
Acting Secretary-Treasurer: Kenneth W. Ford

MEMBERS AT LARGE

Patrick McCray, Daniel Siegel, Noemie Benczer-Koller, Michael Nauenberg, John Rigden, Roger H. Stuewer

EX OFFICIO MEMBERS

Michael Riordan, Gloria B. Lubkin,
Spencer R. Weart, Benjamin Bederson

COMMITTEE MEMBERSHIPS

Editorial Board and Publications Committees

Benjamin Bederson, Chair, William Evenson, Daniel Greenberger, John Rigden, Michael Riordan, Spencer Weart

Fellowship Committee

Virginia Trimble, Chair, Gerald Holton, Robert Romer, Roger Stuewer

Nominating Committee

Michael Riordan, Chair,
Noemie Benczer-Koller, Gloria Lubkin,
Daniel Segal, George Trilling

Program Committee

Robert Romer, Chair, Nina Byers, Laurie Brown, Gerald Holton, Harry Lustig, Michael Nauenberg, John Rigden, Roger Stuewer, Virginia Trimble

(Pais) Award Committee

Harry Lustig, Chair, Benjamin Bederson, Gloria Lubkin, Michael Riordan, Roger Stuewer, Spencer Weart

(Pais) Award Selection Committee

Roger Stuewer, Chair, Allan D. Franklin, Lillian Hoddeson, Anne J. Kox, Spencer Weart

Membership Committee

Harry Lustig, Chair, William Evenson, Patrick McCray, Michael Nauenberg, Daniel Siegel, Virginia Trimble

Historic Sites Committee

John Rigden, Chair, Gordon Baym, Alan Chodos, Sidney Drell, Mildred Dresselhaus, Gerald Holton, Spencer Weart

Letters to the Editor

in his book “*Recollections and Reflections*” (Macmillan of Canada, 1936) and he describes using the occasion to visit his many former “pupils” in (North) America of whom J. C. McLennan was one and Harvard’s Theodore Lyman was another.

I am led to guess that a reason why my father’s Canadian career was given less attention might be because in 1922 he joined the Department of Mathematics in the new Faculty of Arts and Sciences at the University of Buffalo, across the Niagara River from our ancestral base and taught advanced analytical mathematics mainly to physics students until he retired in 1955. After that he taught advanced placement students mathematics in a special secondary school for another 10 years. He died in 1976 at the age of 91.

With kind regards,
Robert V. Pound

PS: I had meant to mention a ditty I learned as a boy from my father who frequently sang it. I don’t know if it is known over here—I think more likely it came from the UK with whom the Toronto people were closer to at that time. Anyway it goes:

*Oh I am a radium atom
In pitchblende I first saw the day,
But now I am turning into helium,
My energy’s wasting away.*

*About the laboratory latterly
I always have seemed in the way,
I bothered both Kimble and Satterly
And many bad things made them say.*

Oh I am a radium atom - etc.

There were probably more verses but these are all I remember from some 75 years ago.

To the Editor:

As a member of the Forum on the History of Physics, I thought others might be interested in the project I have just completed on Benjamin Franklin and Electricity, described in the announcement below.

Sincerely,

Robert A. Morse, Ph.D., Physics Master St. Albans School, Washington, DC 20016

A new web resource on Benjamin Franklin’s work in Electrostatics Franklin

and Electrostatics: Ben Franklin as my Lab Partner by Robert A. Morse, St. Albans School, Washington, DC 20016 robert_morse@cathedral.org is now available for free viewing and download on the website of the Dudley Wright Center for Innovative Science Teaching at Tufts University.

The URL for the project is http://www.tufts.edu/as/wright_center/fellows/bob_morse_04/index.html Morse’s long interest in Franklin’s work on electrostatics, sparked by Rodney LaBrecque’s chapter on Franklin’s experiments in the American Association of Physics Teachers workshop manual, Teaching About Electrostatics (AAPT 1992) led to a larger project on Franklin’s experiments during a sabbatical at the Wright Center at Tufts University.

The result is a web publication of teaching materials in which Franklin’s text is presented side by side with modern table top experiments using inexpensive materials. The downloadable package, available on the Wright Center website tufts.edu/as/wright_center has three components:

1. An extensive collection of Franklin’s correspondence on electricity in PDF format transcribed primarily from Bigelow’s 1904 edition of Franklin’s work, with additions from Sparks 1837 edition. (two layouts—one for screen, one for print)

2. Nine sections of a laboratory guide to reproducing many of Franklin’s experiments using inexpensive, modern materials. The experiments are suitable for individual use or for adaptation to classroom use. The guide is illustrated by numerous reproductions of plates from older sources as well as drawings and pictures of the modern equipment, and includes historical commentary and citations.

3. A set of Quicktime™ movie clips supplements the sections, illustrating the techniques of constructing and using the equipment.

This project was supported by a fellowship from the Wright Center for Science Teaching, Tufts University, Medford MA, and by a sabbatical grant from St. Albans School, Washington, DC

All correspondence should be directed to the editor at ben.bederson@nyu.edu.

HISTORY of Physics NEWSLETTER

American Physical Society
One Physics Ellipse
College Park, MD 20740

Presorted
First Class
US Postage
PAID
Bowie, MD
Permit No. 4434