NEWSLETTER

OF THE SOCIETY FOR THE HISTORY OF TECHNOLOGY

No. 102, n.s., January 2004

SECRETARY'S MESSAGE

To paraphrase one of my favorite press conferences, "You won't have Bill Leslie to kick around any more, because this is my last Newsletter." Actually, you've treated me a lot better than the press treated Richard Nixon, and whatever lumps I've taken have been well-deserved. Honestly, the last four years have been an eye-opener. I have learned far more than I expected, made plenty of new friends, made no new enemies I'm aware of, and gained a real appreciation for how much work goes into a volunteer professional society. When my next issue of *Technology and Culture* arrives, I'll be thinking of all the hours behind it, from beating the bushes for good manuscripts and reviewers to negotiating contracts with Project MUSE and JSTOR. And I'll thank John Staudenmaier, Joe Schultz and their staff. While I'm taking in the sights of Amsterdam next fall, I'll recall the countless hours that go into a successful meeting, most of them logged by our local arrangements committees, and be a bit more patient if a bus is late or a meeting room is a little overcrowded. I won't be at our writer's workshop next summer, however much I'd benefit from it, but I now appreciate everything Roz Williams and her committee had to do to make it happen. Instead of letting that Campaign for SHOT pledge card stare back at me from my in-box, I'll send in my contribution knowing that David Hounshell has led by energy and example and deserves my support. And yours. So send in that pledge. Richard Hirsh will thank you, but you should be thanking him, for managing a major investment portfolio so skillfully without being able to follow the bad example of his private-sector counterparts and skim a little off the top. I will be enjoying next year's Awards Banquet from the other side of the podium, but I'll be wondering how those prize committee members found time to read all those books, articles, and manuscripts.

The next time someone asks me to serve SHOT, I'll say yes, because the members who say yes keep us going. If you thought that our Officers, our Executive Council, and our elected and appointed committee members are just adding lines to their c.v.'s, think again. SHOT works because its members work. W.E.B. DuBois understood the importance of the Talented Tenth. That's just about the percentage of our members who come to our meetings, serve on our committees, vote in our elections. Surely we have sufficient talent and energy to double the number of active members. If you'll pardon another presidential paraphrase: "And so, my fellow SHOT members, ask not what SHOT can do for you—ask what you can do for SHOT."

I can assure you that SHOT will be in good hands in the years ahead, and not just because they won't be my hands. Amy Bix brings to the Secretary's office every possible qualification—commitment, enthusiasm, experience, attention to detail, the full support of her department and her university. Even her scholarship has prepared her for the position. What Secretary wouldn't want to know the secrets of "Inventing Ourselves Out of Jobs?"

Remember that with a new Secretary comes a new address, a new e-mail, and a new phone number. I still get mail addressed to Lindy Biggs, some addressed to Bruce Seely or

In This Issue

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***SHOT Newsletter* Editorial Policies, Advertising Rates, and Submissions Deadlines**
The *SHOT Newsletter* is published quarterly in April, July, October, and January and is sent to all individual members of the Society. Items for inclusion will be published **if received by the 1st of the previous month**. Please note that material for the newsletter may be submited via electronic mail. Non-members and institutions may receive the *Newsletter* by separate subscription for $15 per year. The *Newsletter* can also be read at the SHOT website.

Readers should verify closing dates and other information provided by institutions and sponsors; the editor and SHOT are not responsible for changes or typographical errors. Advertising for books, journals, and other matters related to the interests of the Society and its members is accepted if received by the 1st day of the previous month.

Advertising Rates: Full Page (7-1/2" x 9-1/2"), $200; Halfpage (7-1/2" x 5" or 3" x 9-1/2"), $150; Quarterpage (3" x 5"), $100

The SHOT logo was created by Brickworks of London

Alex Roland, and one or two things addressed to Carroll Pursell or Mel Kranzberg! Secretaries may fade away, but their mailboxes stay full. So do remember to note the changes and you'll get a quicker response.

My thanks to the members for a wonderful term of office. The mistakes I've made are now buried in the archives for future Secretaries to discover. My file cabinets now have room for the research projects put on hold the past four years. My 'to-do' list is shorter and I can retire that second Franklin Planner, which didn't really help all that much but looked sharp on the desk just the same.

As I move aside, SHOT moves ahead. I would like to call your attention to the article on technological literacy and K-12 education. We have talked for some time about outreach to this audience. Wes Perusek, William Dugger, and Glenn Perusek write with first-hand experience about "Improving Technological Literacy in the Schools". They provide an overview of national initiatives, offer some reflections on Ohio's experience, and suggest ways that historians of technology can contribute to this effort. I hope this will jump-start a conversation about what SHOT should be doing for K-12 education. If we don't think that history and science textbooks give sufficient attention to the history of technology, then we should be doing something about it. Not many of us will end up teaching K-12, or writing textbooks for middle and high school students. But there are plenty of opportunities to partner with K-12 educators. Not since Sputnik has there been more attention focused on what younger students learn about science and technology, or more funding behind curricular reform. SHOT ignores this debate at its peril. We have something important to tell these students, and a direct stake in their education. After all, we are going to see many of them sooner or later, as students in our classrooms, as visitors to our museums, as future workers, professionals, politicians. They already know technology plays a central role in their everyday lives. Will they learn how much their future depends on understanding the past? Teach a student, and you've accomplished something. Teach a teacher, and you've accomplished much more. I hope some of our members will give serious thought to how we make our scholarship relevant to K-12 teachers, and how we incorporate these fellow educators into SHOT. Having spent the last three years working with Teach for America, I can assure you almost anyone can teach elite college students. It takes real gifts to teach fifth graders. Those willing to shoulder this burden deserve our respect, and whatever help we can give them.

Stuart W. Leslie,
Johns Hopkins University

SOCIETY NEWS

2004 Annual Meeting Call for Papers

The Society for the History of Technology will hold its annual meeting in Amsterdam from October 7-10. The Program Committee is seeking proposals for both individual papers and complete panels. In particular, the committee welcomes work-in-progress from researchers of all stripes (including graduate students, chaired professors, and independent scholars), and papers from those new to SHOT who believe that an engagement with history can help their own work, regardless of discipline.

This year the program will focus on the specific themes outlined below. While the committee is open to proposals not falling strictly within the themes, we nevertheless do encourage submissions that enter a dialogue with them.

**Water*
The geography and history of the Netherlands lends itself to a focus on water; this, broadly defined, forms one of the conference themes. Access to and control of water has been central to human life, and it is a long-contested resource; this has inevitably had a technological component. Agricultural, domestic, industrial, hygienic, and therapeutic applications of water have been components of all civilizations. The committee seeks papers and panels on technology and water in oceans, lakes, rivers, canals, aquifers, spas, springs (including geothermal), and on rain, plumbing, sewers, or any other water-related topic, including political, social or cultural relationships organized around or influenced by water.

**Transatlantic Community*
Building on the water theme, we also welcome papers and panels related to the creation, maintenance, and expansion of the Atlantic Community, defined here as including North and South America, Europe, and Africa. Possible topics include technological components of transatlantic interactions, competitions, exchanges, and the circulation of goods, services, people, ideas, and artifacts.

**Camouflaged Technologies*
We are looking for papers addressing the historical and political trajectories of technologies in camouflage, whose actual uses were hidden to avoid political or social controversy, or to avoid prosecution under the law. Examples might include controversial technologies such as nuclear power, and illicit activities such as drug use, burglary, prostitution, or music piracy, where producers and consumers camouflaged actual uses of these devices.

**Non-Aligned Technologies*
The committee also seeks proposals considering what we call non-aligned technologies — technologies that remain outside or resist larger networks, systems, geographical regions, or historical settings.

**Information Technology (IT) and Media Studies*
Information technology and media are frequently the separate subjects of specialized academic fields. The program committee seeks proposals that problematize their intersections and/or their distinction in a historically informed fashion.

Deadline is April 1, 2004. Please submit your proposals to shot2004@tm.tue.nl.

Proposals for individual papers must include:
1) a one-page abstract;
2) a one-page curriculum vitae, including current postal and e-mail addresses.

Proposals for complete sessions must include:
1) a description of the session's theme;
2) a list of the presenter's names and paper titles;
3) a one-page abstract and one-page c.v. for each of the presenters (with postal and e-mail addresses);
4) a one-page c.v. for the commentator, chair, and session organizer (if s/he is not one of the session's panelists).

The session description should clarify how individual papers contribute to the session's overall theme.

Applicants may submit as follows:

* Electronic application: send one single e-mail message to the program committee e-mail address: shot2004@tm.tue.nl with electronic copies of all elements of the complete proposal as attachments, *formatted in Microsoft Word* (any version of Word is fine, but it must be in Word).

Guidelines for submission:

- Whether submitting an individual paper or a complete panel, the program committee needs to receive a separate attachment for each item (vitae, paper, and so on).

- Please save your proposal with your last name and the word proposal, (for example brown.proposal.doc)

- Please save your c.v. (idem for panel members) also with your last name and the word vitae, (for example brown.vitae.doc)

- In case of a panel, please save their abstracts with their last name and the word abstract, (for example brown.abstract.doc)

- The file names for all attachments should end in .doc (for example hounshellvitae.doc)

Once the program is fixed the committee will make arrangements to make the accepted abstract available on the World Wide Web (details pending and to be announced).

SHOT NOMINATING COMMITTEE CALL

The SHOT Nominating Committee has begun assembling a slate of candidates for the 2004 election, including the position of vice president/president elect. Members interested in suggesting possible candidates should contact the chair of the committee, Deborah Douglas (ddouglas@mit.edu).

SHOT PRIZES FOR 2004

The SHOT prizes will be awarded at the annual meeting in Amsterdam October 7-10, 2004. For details on submitting nominations for the SHOT prizes, see the web site or contact the Secretary's office: shot@iastate.edu or 515-294-84699.

The **Leonardo da Vinci Medal** is the highest recognition from the Society for the History of Technology. It is presented to an individual who has made an outstanding contribution to the history of technology through research, teaching, publication, and other activities. The 2004 committee members are Daryl Hafter, chair (his_hafter@online.emich.edu),

The **Edelstein Prize** is awarded to the outstanding book published in the history of technology, broadly defined, published during the period 2001-2003. Non-English language books are eligible for three years following the date of their English translation. The prize consists of $3500 and an engraved plaque. Publishers and authors are invited to nominate titles for this prize. To nominate a book send one copy to EACH of the committee members. Deadline for receipt of books is **1 April 2004**. Committee members for 2004 are Leonard Rosenband, chair, Stephen H. Cutcliffe and Karin Zachmann.

The **IEEE Life Members' Prize in Electrical History** was established by the IEEE Life Members, who fund the prize, and is administered by the Society for the History of Technology. The prize recognizes the best paper in electrical history published during the previous year, in this case 2003. Any historical paper published in a learned journal or magazine is eligible if it treats the art or engineering aspects of electrotechnology and its practitioners. Electrotechnology encompasses power, electronics, telecommunications, and computer science. The committee invites submissions for the 2003 prize. Please send a copy of the paper to EACH member of the prize committee by **1 May 200**. The prize consists of a cash award of $500 and a certificate. The 2004 committee members are David Hochfelder, chair, Mary Ann Hellrigel, and David Mindell.

The **Samuel Eleazar and Rose Tartakow Levinson Prize** is awarded for a single-authored, unpublished essay in the history of technology that explicitly examines in some detail a technology or technological device/process within the framework of social or intellectual history. **It is intended for younger scholars and new entrants into the profession.**Manuscripts should be in English and of a length suitable for publication as a journal article. The closing date for nominations is **1 May 2004**. The award consists of $400 and a certificate.The 2004 committee members are Chris McKenna, chair, Patrick McCray and Henrik Björck.

Presenters at the 2003 annual meeting of the Society for the History of Technology are invited to nominate their presentations for the 2004 **Joan Cahalin Robinson Prize**. Established in 1980 by Dr. Eric Robinson in memory of his wife, the prize is awarded annually for the best presented paper at the SHOT meeting. Candidates for the award are judged on the quality of the historical research and scholarship of the paper, but special attention is paid by the awards committee to the effectiveness of the oral presentation. Graduate students who are giving their first paper at a SHOT meeting will be eligible for the prize; young scholars who have received their PhD no more than one year before are also eligible. The Robinson Prize consists of a check for $350 and a certificate. Those wishing to nominate themselves and their paper for the prize should do this when they submit their abstract to the Program Committee. Once accepted onto the program, nominees should send an abstract of their paper (not the complete paper) and an abbreviated curriculum vitae (1-page) to EACH member of the prize committee. Please be certain to confirm your status as a graduate student or a recent PhD. **The deadline for the Call for Papers is April 1, 2004. The deadline for receiving these documents is 1 June 2004.** The committee members for 2004 are Ann Johnson, chair, Greg Downey, Kelly DeVries, Erik Conway, Geert Verbong, Scott Knowles and Mark Finlay.

The **Abbott Payson Usher** Prize was established to honor the scholarly contribution of the late Dr. Usher and to encourage the publication of original research of the highest standard. It is awarded annually to the author of the best scholarly work

published during the preceding three years under the auspices of the Society for the History of Technology. The prize consists of $400 and a certificate. The 2004 committee members are: Robert Fox, chair, Eric Schatzberg and Suzanne Moon.

The **Sally Hacker Prize** is awarded to the best popular book published during the period 2001-2003. The prize, consisting of $2000 and a certificate, recognizes books in the history of technology that are directed to a broad audience of readers, including students and the interested public. Publishers and authors are invited to nominate titles for this prize. To nominate a book send one copy to EACH of the committee members. Deadline for receipt of books is **1 April 2004**. Committee members are Joyce Bedi, chair, Howard Segal and Bruce Hevly.

The **Melvin Kranzberg Dissertation Fellowship**, was established in 1997 in memory of the cofounder of the Society, and honors Melvin Kranzberg's many contributions to developing the history of technology as a field of scholarly endeavor. The $2000 award is unrestricted and may be used in any way that the winner chooses to advance the research and writing of his or her dissertation. Possible uses include underwriting the costs of travel to archival collections; photocopying or microfilming; translation of documents; and so on. The award may not be used for university tuition or fees. Students from institutions of higher learning anywhere in the world who are working on projects in the history of technology are eligible to apply; doctoral candidates from outside the United States are especially encouraged to submit application materials. Applicants must have completed all requirements for their doctorate except for the dissertation by 1 September 2003. **Deadline for application is April 1, 2004.** Committee members : Robert Ferguson Jennifer Light, Tom Lassman, Atsushi Akera and Sara Pritchard.

The Society for the History of Technology invites applications for the **Brooke Hindle Post-Doctoral Fellowship** in the History of Technology for 2004-2005. The award is for $10 000 and may be used, as further detailed on the SHOT website, for any purpose connected with research or writing in the history of technology for a period of not less than four months between 1st September 2004 and 31st August 2005.The Fellowship honors the contribution of Brooke Hindle to the work of the Society for the History of Technology and is made possible thanks to the generosity of his family. Applications must be made in written English and submitted to the chair of the Fellowship Committee either by mail or e-mail (no faxes will be accepted), to be received by **1st May 2004.** Committee members: Bev Sauer (chair), Karin Bijsterveld and Ross Bassett.

SHOT's **International Scholars** program was established to encourage greater participation in SHOT by scholars outside North America and to improve communication among historians of technology around the world, and to foster an international community of scholars in our field. The program is also intended to support historians just beginning their careers by providing them recognition in their own countries. Nominees must reside outside the United States and the selection committee gives priority to junior scholars. Those selected for a two year term receive a subscription to *Technology and Culture*, and are invited to attend SHOT's meetings. In addition, they will be asked to prepare a report or review essay on current developments in the history of technology in their country, or of their own work, for presentation or publication by the Society. The International Scholars Committee asks all SHOT members to help identify qualified individuals for this program for 2004-2005. Self nomination is also encouraged. Committee members: Dong-Won Kim, chair, Takehiko Hashimoto, and Aristotle Tympas.

SHOT **Travel Grants** provide travel assistance to the meeting in Amsterdam in October 2004. Applicants should know that SHOT travel grants are not intended to provide the full costs associated with attending the society's annual meeting; they are intended as an encouragement, not a full subsidy. The program is focused on graduate students, independent scholars, and young professionals just beginning their careers planning to attend the meeting in Atlanta. Others who are eligible include the Society's International Scholars. The travel fund was initiated by Hugh Aitken in 1988 and has been supported by individual SHOT members, royalties from two anthologies of articles from *Technology and Culture*, and generous contributions from the Dibner Fund. Additional funds come from the National Science Foundation. The Committee should have applications by **1 June 2004**. The Secretary will notify recipients by about 1 July 2004. Committee members are Mary Thomas, chair, Hans Weinberger and Rayvon Fouche.

SHOT 2004 Budget

Approved at the October 2003 Executive Council Meeting

Income

Unrestricted Income

Advertising—newsletter	$300
Annual Meeting	$0
Memberships	$80,000
Copyediting subvention from JHU	$7,500
Subscriptions	$100

Unrestricted donations	$1,000
Dividends and Interest	$18,000
Total Unrestricted income:	$106,900
Restricted Income	
Donations	
Dexter (Edelstein) prize	
Dibner fund	$15,000
YSTravel (From Dibners)	$10,000
YSTravel (From individuals)	$250
Ferguson Prize Fund	
Kranzberg	
Levinson	
Sally Hacker Prize	$0
SIGS (Mercurians, WITH, Envirotech)	$500
Grants: NSF3—travel grant	$12,125
Publication Royalties	$300
Total Restricted Income:	$38,175
Total Income:	$145,075

Proposed Budget for 2004

Expenses

Unrestricted Expenses

Ann Mtg	
Prog comm	-$2,000
General meeting expenses (bank fees + misc)	
Total annual meeting:	*-$2,000*
Secretariat	
Newsletter - Total—printing + postage	-$6,500
Admin svcs	-$24,000
Travel	-$500
Ballots and other general expenses	-$1,000
Postage	
Insurance	-$1,200
New Secretary Search Expenses	
Total Secretariat:	*-$33,200*
Treasurer:	
Accounting and tax prep fees	-$3,000
Supplies and misc.	-$100
Total Treasurer:	*-$3,100*
T&C Endowment Development Committee	-$1,000
Executive Council - Spring meeting	-$5,500
T&C	
Book Review Editor	-$2,750
Copyediting	-$12,000
Office secretarial	-$250
Editor's salary supplement	-$5,000
Total T&C:	*-$20,000*
Society Memberships	
ACLS	-1,000
AHA	-$350
ICOHTEC	-$500
NCCPH	
NHA	-$1,000
NINCH	-
$500	
Total Society Memberships:	*-$3,350*
SIG Matching Grants	
Mercurians	-$300
WITH	-$300
Envirotech	-$300
Total SIG Matching Grants:	*-$900*
Contingency/Miscellaneous	-$1,500
New items not in 2003 budget	
Trial Writing Workshop	-$20,000
Web redesign	-$5,000
Total Unrestricted Expenses:	-$95,550

Restricted Expenses

Travel grants	
SHOT annual mtg—from NSF3 grant	-$12,125
SHOT annual mtg—from Dibner Fund (YS Fund)	-10,000
ICOHTEC (from Young Scholar Fund)	-$5,000
Total travel grants:	*-$27,125*
Prizes	
Edelstein (former Dexter) prize	-$350
Dibner prize	
Advertising	-$500
Postage	-$500
Winner travel	-$500
Plaque engraving	-$200
Total Dibner Prize:	*-$1,700*
Hacker Prize	-$2,000
Hindle Postdoc Fellowship	-$10,000
Kranzberg flshp	-$2,000
Levinson prize	-$450
Robinson prize	-$350
Usher prize	-$450
Total Prizes:	*-$17,300*
Dibner Fund	
AHA-SHOT Pamphlets	-$3,000
Exhibit Review	-$1,000
Total Dibner Fund Expenses:	*-$4,000*
Support for graduate student organizations	-$500
SIG Reimbursement	
Mercurians	-$300
WITH	-$300

Total SIG Reimbursement:	*-$600*
Total Restricted Expenses:	-$49,525
Total Expenses (Unrestricted + Restricted):	-$145,075
Total Income - Total Expenses:	$0

Note: T&C endowment income and expenses are included in a separate account. Not listed in this budget.

Prepared by Richard Hirsh. Amended and approved 10/16/03 by Executive Council.

FROM THE PRESIDENT'S DESK

The Campaign for SHOT: How Are We Doing and How Do You Measure Up?

David A. Hounshell, President

The fundraising campaign to endow the position of SHOT's most vital office, the Editor of *Technology and Culture*, continues in its third year. As you perhaps know from the ups and downs of your personal portfolio over the last few years, the collapse of the technology/dot-com bubble in 2000 plus the worsened economic condition of the United States following the tragedies of September 11, 2001, have made raising money for any endowment a difficult challenge. Things got so bad last year that several foundations were forced to put freezes on all new grants and struggled just to meet existing obligations. Many were forced to lay off staff to meet their payrolls.

When it launched The Campaign for SHOT in October 2001, your Executive Council believed that with SHOT's size and its track record of having been the major institutional force in creating a vibrant field of study known as the history of technology, we could succeed in raising sufficient funds to endow, at least in large part, the Editorship of the premier journal in the field, *Technology in Culture*. At this point, as we approach what has been planned as the final year of The Campaign for SHOT, it is obvious that we are far short of our goal. At its upcoming Spring Meeting, the Executive Council will be discussing what actions the Society needs to take in light of this situation.

So where do we stand, and how do you measure up as a contributor to the endowment for the Editorship? As of the end of November 2003, we have received contributions and pledges totaling $113,065. This sum includes a $30,000 gift from the Richard Lounsbery Foundation, Inc., of New York, but it does not include an extremely generous donation of 10,000 Euros from a consortium of history of technology-related faculties at Dutch universities (Twente, Maastricht, and Eindhoven), the Eindhoven-based Foundation for the History of Technology, and two individuals who are leaders in the history of technology in the Netherlands (more about this wonderful gift in a future Newsletter). One hundred and sixty (160) members of SHOT (comprising 159 gift units) have given money or pledged to give money to the editorial endowment. Their gifts range from $2 to $6000, with an average of $513 per gift unit. This average excludes the gift from the Lounsbery Foundation and the Dutch gift. The median of all individual gifts is $200 (also excluding the Lounsbery and Dutch gifts).Donations (and/or pledges) from individuals break down as follows:

Gift Range	Number of Individual Gift Units
>$3500	1
$2,000-3,499	15
$1,000-1,999	20
$500-999	14
$250-499	25
$100-249	42
<$100	43

A few observations are in order. First, judging by the number of scholars who have attended SHOT's annual meetings over the last three years, the number of donors is less than half the average number of Annual Meeting attendees. Second, judging by the number of SHOT members who have published work in *Technology and Culture* over the last five years, SHOT's core membership group is at least double the number of individuals who have made some type of commitment to endow the journal's Editorship.

If you have not given to The Campaign for SHOT, I invite you to make a commitment to the future of *Technology and Culture*. You can donate through the SHOT Web page (http://www.shot.jhu.edu/). If you have given or pledged, I hope you'll evaluate where you stand relative to those who have also given or pledged and especially relative to what the Society for the History of Technology has meant to your professional—or avocational—life. If you have made a pledge but have not fulfilled it, please, by all means, do so.

Finally, although foundations have struggled over the last three years to meet their commitments, most reports of individual giving to institutions, organizations, and charities that I have read over the period suggest that individuals continued to be generous and to look—and to take action—toward a brighter

future. By our taking action now to build an endowment that can defray the high costs of editing *Technology and Culture*, SHOT members can look toward a more secure future for the Society for the History of Technology and our vital journal.

NEWS OF MEMBERS

Dutch History of Technology Series Completed

Queen Beatrix of the Netherlands was presented the first copy of the seventh and last volume of *Technology in the Netherlands in the Twentieth Century (*Techniek in Nederland in de Twentigste Eeuw*)* on November 12, 2003 in Amsterdam. This presentation marked the formal conclusion of the 10-year project under the scholarly direction of **Johan Schot, Harry Lintsen, Arie Rip, and Adri Albert de La Bruhèze** to which more than 80 researchers contributed. It was supported by the Netherlands Organization for Scientific Research (NWO), the Foundation for the History of Technology (Stichting Historie der Techniek), and industry. As a gift to the Dutch nation, a number of multinationals including Shell and Philips have donated a complete series of the books to every high school in the Netherlands.

Earlier in the day, Harry Lintsen was honored by being knighted in the Order of Orange Nassau. He received this royal recognition for his contribution to the development of the discipline of the history of technology both intellectually and institutionally in the Netherlands.

Photos of both events can be seen at: www.histech.nl (click *Nieuws*; click *fotos*).

NSF SUPPORT FOR SHOT SCHOLARS

Keith R. Benson
STS Program Officer

Greetings to SHOT members from Washington, DC! There are a few items I would like to discuss with you, to keep you informed about NSF support for your research activities. But first and foremost, I wanted to encourage you to consider NSF for support of your work. We are always interested in discovering what the latest developments are in the SHOT community and we are always looking for more good proposals. So, send me your ideas and your research proposals and I will do my best to support them.

Second, the STS Program Announcement formats have changed. Recently, NSF has attempted to provide more uniform advice to potential researchers, so we have all been asked to revise our various funding categories. The most common award from the program is the **STS Scholars Awards**, which supports research by an individual scholar for an academic year, summer(s), or for longer periods of time. Support can include salary, travel and research expenses, assistance for graduate and undergraduates students, and other costs. **Grants for Collaborative Research** support projects involving several investigators. Two different types of **STS Fellowships** are available. **Postdoctoral Fellowships** are for scholars within five years of the award date of their doctoral degrees. **Professional Development Fellowships** offer opportunities for more senior scholars who seek to gain formal knowledge of science and technology specialties (for historians and social scientists) or in the humanities and social sciences (for scientists and engineers) in order to improve their STS activities. **Doctoral Dissertation Research Grants** support research expenses not normally available through the student's university. **Small Grants for Training and Research Fellowships** provide sustained research opportunities for a group of graduate students and postdoctoral fellows on important issues or topics in STS. These opportunities usually extend for three years. The program also accepts proposals for **Conferences and Workshops,** with support normally limited to $10,000. **Small Grants for Exploratory Research** are also available; please contact the program to discuss the guidelines governing such proposals. The program also supports efforts to expand the experiences of **undergraduates in research** (REU). Detailed information on the program and its activities, program guidelines, and information on application materials can be found at the program's website (http://www.nsf.gov/sbe/ses/sts/start.htm). **The target date for the next round of competitions is 1 February 2004.** Please feel free to contact the program with any questions about the program or the application process (kbenson@nsf.gov).

Additional opportunities also exist for STS scholars inside other programs at the Foundation. For example, **Societal Dimensions of Engineering, Science, and Technology Program (SDEST)** supports studies considering the ethical and values elements in science and technology, as well as research related to "improving approaches and information for decision making concerning management and direction of research, science, and technology." SDEST Program Director Rachelle D. Hollander often collaborates with the STS Program in co-funding projects. For more information, see the SDEST webpage: http://www.nsf.gov/sbe/ses/sdest/start.htm

Finally, I will be rotating from the Program Officer position at NSF. It has been a fabulous experience and one I would be eager to encourage you to consider. So, if you are at all

interested in the position but you need to know more about the details of the job, be sure to contact me. I may be reached via email (kbenson@nsf.gov) or by telephone (703-292-7283).

FELLOWSHIPS

PROGRAMS OF SUPPORT FROM THE IEEE HISTORY CENTER: 2004/2005 The IEEE History Center is pleased to announce the competitions for two 2004 awards: **IEEE Fellowship In Electrical History—Academic Year 2004/2005** The IEEE Fellowship in Electrical History supports either one year of full-time graduate work in the history of electrical science and technology at a college or university of recognized standing, or up to one year of post-doctoral research for a scholar in this field who has received his Ph.D. within the past three years. This award is supported by the IEEE Life Members Committee. The stipend is $17,000, with a research budget of $3,000 also supplied. Candidates with undergraduate degrees in engineering, the sciences, or the humanities are eligible for the Fellowship. For pre-doctoral applicants, however, the award is conditional upon acceptance of the candidate into an appropriate graduate program in history at a school of recognized standing. In addition, pre-doctoral recipients may not hold or subsequently receive other fellowships, but they may earn up to $5,000 for work that is directly related to their graduate studies. Pre-doctoral Fellows must pursue full-time graduate work and evidence of satisfactory academic performance is required. These restrictions do not apply to post-doctoral applicants. The Fellow is selected on the basis of the candidate's potential for pursuing research in and contributing to electrical history. Application forms are available on-line or by request from the IEEE History Center (see contact information below). **The deadline for completed applications is 1 February**. This completed application packet should be sent to the Chairman, IEEE Fellowship in Electrical History Committee, IEEE History Center, Rutgers—The State University of New Jersey, 39 Union Street, New Brunswick, NJ 08901-8538. Applicants will be notified of the results by 1 May 2003. The IEEE Fellowship in Electrical Engineering History is administered by the IEEE History Committee and supported by the IEEE Life Members Committee. **IEEE History Center Internship—2004** Scholars at the beginning of their career studying the history of electrical technology and computing are invited to contact the Center to be considered for a paid Internship at the Center's offices on the Rutgers University campus in New Brunswick, New Jersey. The Intern program seeks to provide research experience for graduate students in the history of electrical and computer technologies, while enlisting the help of promising young scholars for the Center's projects. The Intern generally works full-time for two months at the History Center on a Center project that is connected to his or her own area of interest. This time is usually during the summer, but other arrangements will be considered. Interns are also encouraged to consult with the Center's staff and its associates, and guided to research resources in the area. The Internship is designed for those near the beginning or middle of their graduate careers, but advanced undergraduates, advanced graduates, and, on rare occasions, recent Ph.D.s will also be considered. Special consideration is often given to scholars from outside the United States who might not otherwise have an opportunity to visit historical resources in this country. The stipend paid to the intern is US$3,500. Additional funds may be available to defray travel costs, depending on the Intern's circumstances. This Internship is supported by the IEEE Life Members Committee. There is no formal application form. To apply, please mail a curriculum vitae showing your studies in electrical history along with a cover letter describing the sort of project you would be interested in doing (see contact information below). **The deadline for contacting the IEEE History Center is 15 March 2004**. IEEE is an AA/EO employers. Women and minorities are encouraged to apply for all positions. The IEEE History Center is cosponsored by the Institute of Electrical and Electronics Engineers, Inc. (IEEE)—the world's largest professional technical society—, and Rutgers—the State University of New Jersey. The Center can be contacted at: **I**EEE History Center, Rutgers University, 39 Union Street, New Brunswick, NJ 08901-8538 email: history@ieee.org http://www.ieee.org/history_center

The National Humanities Center's Summer Institutes in Literary Studies give scholars the opportunity to engage a small number of literary texts deeply through close reading under the direction of leading critics. The Institutes are open to scholars who have received a Ph.D. within the last ten years and who teach in departments of literature or other relevant disciplines at colleges or universities in the United States. Each institute will accommodate twelve participants. Participants will receive a stipend of $1,500. The National Humanities Center will cover the cost of travel, lodging, meals, and texts. For complete details and an application, visit www.nhc.rtp.nc.us/siliterarystudies/index.htm **Application deadline: February 27, 2004**

CALLS FOR PAPERS

The **International Committee for the History of Technology** will hold its 31st Symposium at Bochum, Germany, 17th - 21st August 2004 on(Re-)Designing Technological Land-

scapes. The symposium program committee suggests the following themes to contributors: - What concepts for setting up technological landscapes existed? - To what extent were those concepts put into reality? (The emphasis should be on change and on comparisons between different concepts and attempts to implement them.) - Who were the main actors; which factors advanced or hindered the development of technological landscapes? - What were the political and social aims; how were these processes financed? - What were the main technological aspects? - What (perhaps singular) element(s) were particularly important in these processes? - Which problems arose when people left less or more densely populated areas; what sort of challenges came up when new demands, for example ecological ones, had to be met? - What about the reception of these developments in the arts and in the media? - What has been the relationship of gender, ethnicity or race to technological landscapes? (It would be desirable if the above issues and others suggested by contributors were investigated in a chronologically and geographically comparative perspective.) Although the main focus of ICOHTEC 2004 will be on "Re-designing technological landscapes" it is also possible to propose sessions and individual papers on other topics. The ICOHTEC Program Committee welcomes proposals for individual PAPERS and SESSIONS for the 31st Symposium in Bochum, Germany. **Deadline for proposals is 1 February 2004.** Membership in ICOHTEC is not required to participate in the symposium. Proposals for PAPERS should include: (1) 400-words (maximum) abstract in English; (2) short CV (1-page maximum). In order to permit discussion, presenters will have 20 minutes to deliver papers. Proposals for SESSIONS should include the following: (1) an abstract of the session (250 words maximum); (2) a list of the proposed session papers; (3) abstracts for each paper (400 words maximum); (4) short CV (1-page maximum) for each author. ICOHTEC sessions customarily include a chairperson, but no separate commentator. Sessions should include a minimum of four speakers, and may include several parts extending for several days. Please send all proposals for SESSIONS and PAPERS to the Program Committee by Email: Barton Hacker, Chair of the Program Committee. Email: hackerb@si.edu Maria Paula Diogo. Email: mop28980@mail.telepac.pt Sue Horning. Email: ssh@gwis.com Wolfgang Koenig. Email: martin@kgw.tu-berlin.de If Email is unavailable, proposals may be sent by fax to Dr. Hacker: 202-357-1855. Otherwise they may be sent via regular mail, postmarked by 1 February 2004, to: Barton Hacker, 150 12th Street, N.E., Washington, DC 20002, USA Please check the ICOHTEC Website www.icohtec.org for continuing information, dates, and deadlines. Local organizers will be setting up an additional website at www.ruhr-uni-bochum.de/technikhist/icohtec2004 and local email at icohtec2004@ruhr-uni-bochum.de.

IMPROVING TECHNOLOGICAL LITERACY IN THE SCHOOLS

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Introduction

The systematic study of the past is crucial for full development of those who would shape the future. We here argue that historians of technology have a vital role to play in developing a curriculum for the schools that could help foster an atmosphere of innovation and invention among the next generation of engineers, scientists and researchers.

In this short article, we seek to accomplish three things. First, we speak of the importance of sorting out the conceptual problem of drawing too great a distinction between "science" and "technology," arguing that this is a necessary condition for thoroughgoing curricular reform. Second, we describe succinctly efforts now under way to enhance technological literacy in the K-12 system in the United States. Third, we suggest ways that historians of science and technology might contribute to these ongoing efforts.

Science *versus* Technology?

It has long been acknowledged that technological literacy is an important element of a comprehensively educated citizenry. Even those who do not work directly with technology have their lives fundamentally and irretrievably structured by basic, advanced and complicated technology. Yet, even though myriad efforts at the local, state, national and international level have been undertaken, "the majority of these initiatives have taken place within an educational system that for the most part does not recognize technology as an area of academic content in its own right." Technology education is needed, in other words, but it does not have its own place yet at the table of education.[1] Policymakers at the highest level often reinforce neglect of technological literacy when they speak of the need for science standards.

This should not be a surprise. When policymakers and educators alike continue to operate with a strong conceptual distinction between "science" and "technology" they are

reiterating a longstanding distinction between science and technology, between "high" or "pure" science and "low" or "applied" technology. Yet, this distinction was unknown in the ancient world, where techne as "systematic treatment" stood on even footing with episteme, science: as late as the seventeenth century, Bacon could advocate an integrated approach—that scientists study the methods of craftsmen and craftsmen those of science.[2] With the development of highly specialized areas of scientific inquiry in the modern world, pure science came to be esteemed more highly than the "industrial arts," a series of practical matters. Part of our argument here is that efforts to improve scientific literacy in the schools will be significantly enhanced with an *integrated* approach, one that treats science and technology as aspects of a unified curriculum, rather than continuing to maintain what is effectively a mental vs. manual labor distinction, putting technology in the role of handmaiden in service of the "higher" scientific pursuits.

Fortunately, in the past twenty-five years, there has been a growing recognition by educational leaders that the division of science from technology is an educationally detrimental conceptual mistake. As the American Association for the Advancement of Science (AAAS) has written in an important statement, "Technology is even older than mathematics and science. Indeed, the latter may both have developed at first in response to the need to build things and solve practical problems, although discoveries in science and mathematics today often precede practical uses." Technology today "is becoming much more closely tied to mathematics and science and hence is an essential part of the scientific enterprise. Understanding technology and its connections to science and mathematics is therefore necessary for science literacy."[3] *Benchmarks* goes on to say that "unfortunately, technology does not have a place in the general curriculum, so academic students fail to learn about technology or develop engineering problem-solving skills. Furthermore, the technology taught in technology-education classes (formerly industrial arts, and before that, 'shop') is often so singlemindedly vocational that teachers fail to teach about technology in social or scientific contexts."[4]

Let us call these the divisive and the integrated approaches to science and technology. The divisive viewpoint was hegemonic in the American educational community from the 1950s to about 1980. But it came under criticism in the early 1980s, as educators and policymakers from across the spectrum began to realize the damaging effects of holding fast to the rigid distinction between scientific and technological education. The National Science Foundation issued a significant study, *Educating Americans for the 21st Century*, emphasizing the need for a more integrated scientific and technological curriculum.[5] A major 1984 meeting organized by the Exxon Education Foundation concurred. Chaired by Paul DeHart Hurd (Stanford) and including such participants as F. James Rutherford of the AAAS and Fred Hechinger of the *New York Times*, the meeting underlined the importance of integrating science and technology education. The Exxon group lauded the NSF's goals of increasing the technological component of school education and establishing "scientific and technological literacy" as goals for *all* students. "These two recommendations stand in marked contrast to the approach to science education supported by the National Science Foundation (NSF) and accepted by the educational community from 1950 until about 1980. During that period, attention was focused almost exclusively on the educational needs of students aspiring to scientific and engineering careers, and technology was deliberately downplayed."[6]

A sea change in the understanding of educational administrators and leaders was taking place in the early 1980s. The new, integrated approach is championed by the American Association for the Advancement of Science (AAAS), which has advanced a long-range plan for integrated science-technology education reform in their *Benchmarks for Science Literacy*, the Project 2061 report. "By 'science,' Project 2061 means basic and applied natural and social science, basic and applied mathematics, and engineering and technology, *and their interconnections—which is to say the scientific enterprise as a whole*. The basic point is that the ideas and practice of science, mathematics, and technology are so closely intertwined that we do not see how education in any one of them can be undertaken well in isolation from the others."[7]

Efforts of the International Technological Technology Education Association (ITEA)

The International Technology Education Association (ITEA), a private body, is a leader in the effort to advance technological literacy. The ITEA has played a primary role in establishing K-12 standards. Following the trend toward developing content standards, the ITEA published *Technology for All Americans: A Rationale and Structure for the Study of Technology*.[8] Establishing a philosophical orientation and organizational structure for technological literacy in America's public schools, this document was followed by *Standards for Technological Literacy: Content for the Study of Technology (STL)*, in 2000. *STL* defines technological literacy as one's "ability to use, manage, assess, and understand technology."[9] This document passed successfully through a formal review by the National Research Council (NRC), and has been endorsed by the National Academy of Engineering (NAE). As part of their effort backing the ITEA's technological literacy standards, the NAE has published *Technically*

Speaking: Why All Americans Need to Know More About Technology, which makes a compelling case for the need for technological literacy.[10]

Broad public support exists for including the study of technology in the K-12 curriculum. In a 2001 Gallup Poll on "What Americans Know About Technology" fully 97 percent of respondents believe the study of technology should be included in school curriculum, and 61 percent believe that the evaluation of technological literacy should be part of high school requirements.[11]

In 2003, the ITEA published a companion document to *STL, Advancing Excellence in Technological Literacy: Student Assessment, Professional Development, and Program Standards (AETL).*[12] Supporting the effort to improve technological literacy for all students, this publication provides means of assessing students, as well as recommendations of quality programs of professional development for teachers, and enhanced education programs to ensure the delivery of quality technological literacy curriculum in the K-12 system.

Efforts by State Educational Systems

Significant, one might say unprecedented, efforts are underway to integrate technology education into the school experience throughout the United States. There are "major movements being made at the local level for establishing technology education as an important subject in the pre-college program." One survey found that as of 2001, fourteen American states required some form of technology education, six additional states had technology education under school district control, two states awaited pending legislation. Sixteen other states made technology education elective. The largest states—California, New York, Florida, Illinois, Texas, Michigan, Ohio—all have required, or will soon require, technology education at the state level. As of 2000, more than 38,000 technology education teachers were at work in American schools. In addition, regular subject teachers will also teach from these standards. The existence of state-level standards will necessitate a revolution in curriculum and teacher education in the coming years.[13]

The Massachusetts Department of Education undertook consideration of K-12 technology education in several iterations leading to the March 2001 *Massachusetts Science and Technology/Engineering Curriculum Framework.* It defines technology as "1) Human innovation in action that involves the generation of knowledge and processes to develop systems that solve problems and extend human capabilities; 2) The innovation, change, or modification of the natural environment to satisfy perceived human needs and wants."[14]

In Ohio, the process of developing a set of standards in technology education and literacy began only in 1997. The State Board of Education and the Ohio Board of Regents (administering public higher education) created a Joint Council which established common expectations for educational outcomes, which they divided into six content areas—the arts, English language arts, technologies, mathematics, science and social studies. These content areas are in the process of being fleshed out by writing teams. The documents that these bodies are writing contain or will contain standards for all schools in the content areas, curricular recommendations, and will be used as a basis for the assessment and ranking of the performance of the schools.

It is a salutary development that Ohio's science standards include technology as an integral element. Unfortunately, when educators speak of "technology" as subservient to "science," they continue to operate under the historic conceptual separation of science from technology. It is as if the integrated approach advocated by the AAAS has not yet been accepted in the states, where standards documents are being written. The Ohio science standards define "technology" as "human innovation and action that involves the generation of knowledge and processes to develop systems that solve problems and extend human capabilities. The innovation, change, or modification of the natural environment to satisfy perceived human needs and wants."[15] The problem is that this broad, inclusive, innovation-focused definition of "technology" is undermined when the standards report then speaks of technology as a servant of science. Technology is something that is "used" in service of science. The high-low distinction between science and technology continues to be maintained. Thus, at the state level, the old divisive worldview still prevails.[16]

What we see in the current phase of drafting state standards is that both content of the standards *and* the curricular approach to teaching them are relatively new developments and open to discussion. There is a wing of the standards movement that sees it as a back to basics emphasis pure and simple. Other educators recognize that innovative hands-on curriculum, ironically, may be the best way to teach basic competencies.

Private Initiatives Fostering Innovative Thinking

In the context of declining public funding for innovative educational programs since the late 1970s, it is not surprising that much of the most innovative work in technology education has been undertaken by private entities, often funded at least in part by public agencies. Such projects as Future Scientists and Engineers of America (NSF funded)[17], the Invention Innovation Centers Project (IICP) funded by the Ohio Space Grant Consortium (NASA)[18], or Intel's Design and Discovery

Project[19] point the way to curricular innovations that could more effectively educate young people. At present there are 286 FSEA Clubs in elementary, middle and high schools, in sixteen states and Puerto Rico. Each club has approximately twenty-five members, so more than 7,000 students participate. The Ohio project has five sites operating or under development, with units in planning discussions at four additional sites.

These initiatives constitute an important expression of the view that basic standards are best taught when students' natural creativity is enhanced. Some of these educational experiments recognize after-school hours as often wasted discretionary time for many young people.[20] The Ohio project, for instance, seeks to engage students in resource rich invention/innovation centers, where their natural curiosity is the starting point for their inquiries. The centers make available a wide array of materials and artifacts, and the expertise and competencies of mentors—professionals, retirees, craft workers and others from the local community. Ideally, the centers are also clearinghouses for the most effective techniques of problem-solving, such as TRIZ, Talents Unlimited, or Shlesinger's Themes and Keys Approach.[21] Student participants in these centers engage in creative problem-solving projects, often arriving at fascinatingly novel solutions to problems.[22] They get a chance to practice problem-solving skills. As the Project 2061 report put it, "If students are expected to apply ideas in novel situations, then they must practice applying them in novel situations."[23]

Importantly, basic skills are also fostered for students engaged in such inquiries. There is no zero-sum trade-off between creative problem-solving in innovation centers and the development of basic skills competency. Rather, students' interest-driven inquiries in the centers pique their interest in geography or mathematics or social history, in part because students see the relevance of standard skills to their problem-solving inquiries. When students desire to learn, their learning is a hundred times richer and more effective, than when they are bored and merely going through the motions.

Historians and Curricular Reform in the K-12 System

Historians of technology can suggest to teachers, mentors and students the breadth and historical depth of technology, including technics (products of technology), and techniques, (processes). A comprehensive, historically-grounded curricular approach to technology, technics and techniques will help all students correct common misconceptions about technology, such as the understandable but mistaken narrowing, in the present context, of "technology" to "information technology." Computers in the classroom are of course but the most recent technological innovation in a long, varied history.

The structure of incentives for historians of technology, as for other scholars in an academic, higher education setting, hardly promotes teaching and writing directed at the audience of K-12 educators. Yet, incentives could be offered to foster a dialogue between historians of science and technology and educators in the K-12 system. Granting agencies such as the National Science Foundation and private philanthropic bodies such as the Ford Foundation, Spencer, and others, could provide incentives for historians of science and technology to direct some of their scholarly energies toward this audience of K-12 educators. With sufficient money and time, busy academics could be enlisted to work on curricular reform initiatives with the K-12 system. Partnerships between institutions of higher education and the schools could be fostered by public or private granting agencies. The condition of public education is sufficiently fragmented and challenged today that policymakers can fairly easily be convinced that such partnerships should be a public policy priority. At the very least, pilot programs of curricular innovation could be developed. We hope that a dialogue between historians of science and technology and technology educators in the K-12 system can be fostered.

[1] National Academy of Engineering, *Assessing Technological Literacy in the United States*, [Proposal to the National Science Foundation (n.d., 2001?)], 1.

[2] The distinction between science and technology was *not* drawn by Aristotle. As Terence Irwin, who provides an extraordinarily careful translation of Aristotle, *Nichomachean Ethics* (Indianapolis: Hackett, 1999), 347, puts it, for Aristotle, 'science' was "any systematically organized, rationally justifiable and teachable, body of doctrine or instructions. [Sciences], therefore, include crafts such as medicine or gymnastics, and exclude pursuits that proceed by mere experience." In classical Greek, "technology' referred to artful conception or creation, or to systematic treatment, particularly in rhetoric. It must be recalled that rhetoric was the art of the statesman, highly esteemed in the classical polis. "Science" and "technology" are still fundamentally united in the work of the influential fourth century AD neoplatonist Iamblichus, that is, fully six hundred years after the death of Aristotle. In the Middle Ages, the "seven (liberal) sciences" could be used interchangably for the "seven liberal arts." The Oxford English Dictionary, q.v. "science," says that the distinction between science and art is the difference between concern for theoretical truth and for "methods for effecting certain results," but sciences have always had their practical side. With the separation of technology from science, bearing implicit denigration of the former as *merely* "practical or industrial arts," a high-low distinction has been imposed: This is a modern distinction, dating perhaps from the seventeenth century.

[3] American Association for the Advancement of Science, *Benchmarks for Science Literacy: Project 2061* (New York: Oxford Univer-

sity Press, 1993), 323.

[4] AAAS, *Benchmarks*, 323.

[5] *Educating Americans for the 21st Century* (Washington: NSF, 1983). Impetus for the standards movement was provided by U.S. Secretary of Education Terrell H. Bell's creation of the National Commission on Excellence in Education in 1981. The often-cited report of this commission, *A Nation at Risk*, was published in 1983. See www.ed.gov/pubs/NatAtRisk/intro.html. The report recommended adoption of more rigorous and measurable standards in schools, colleges and universities.

[6] *Science Education in the United States: Essential Steps for Achieving Fundamental Improvement: A Report on a Meeting of Educational Leaders Hosted by the Exxon Education Foundation*, January 17-20, 1984 (New York: Exxon Education Foundation, 1984), 5.

[7] AAAS, *Benchmarks*, 321-2, emphasis supplied. The year 2061 is the next arrival in Earth orbit of Halley's comet. The AAAS chose that date to name its science-technology-mathematics reform effort to underscore the long-term nature of the reform process. We view these standards as an exemplary vision of the comprehensive nature of the reforms that are required.

[8] ITEA, *Technology for All Americans: A Rationale and Structure for the Study of Technology* (Reston, VA: ITEA, 1996).

[9] ITEA, *Standards for Technological Literacy: Content for the Study of* Technology (Reston, VA: ITEA, 2000), 7.

[10] National Academy of Engineering and National Research Council, *Technically speaking: Why all Americans need to know more about technology*, ed. A. Pearson and T. Young (Washington: National Academy Press, 2002).

[11] The poll results can be read at <www.iteawww.org/TAA/TAA.html>, then select "Publications."

[12] ITEA, *Advancing excellence in technological literacy: Student assessment, professional development, and program standards* (Reston, VA: ITEA, 2003).

[13] Pamela B. Newberry, "Technology Education in the U.S.: A Status Report," *The Technology Teacher*, September 2001, 6. The article provides a concise summary of responses to a survey on technology education, including the existence of technology education in state frameworks, whether technology education is required in curriculum, and the numbers of technology education teachers, broken down by state.

[14] The Commonwealth of Massachusetts, Department of Education, *Science and Technology/Engineering Curriculum Framework* (Malden, MA: Massachusetts Department of Education, March 1, 2001), 131.

[15] Ohio Department of Education, Center for Curriculum and Assessment, Academic Content Standards, K-12 Science (Columbus, OH: Ohio Department of Education, 2003), p. 300.

[16] For instance, the Ohio Department of Education, Center for Curriculum and Assessment, Academic Content Standards, K-12 Science (Columbus, OH: Ohio Department of Education, 2003) and the separately published technology standards.

[17] See <www.fsea.org> for information on the Future Scientists and Engineers of America.

[18] Materials on Ohio's Invention Innovation Centers Project (IICP) are available from perusek@wcoil.com.

[19] See <intel.com/education/design> for information on the Design and Discovery program.

[20] Leading voices in the after-school movement include: The Carnegie Council on Adolescent Development; Mott Foundation; National Center for Community Education; U.S. Department of Education's 21st Century Community Learning Centers Project; J.C. Penny Foundation; Nellie Mae Education Foundation; and the National Institute on Out of School Time at the Wellesley Center for Women. See for instance, the useful "Fact Sheet on School-Age Children's Out-of-School Time," January 2000, at <www.wellesley.edu/WCW/CRW/SAC/factsht.html>.

[21] Genrich Altshuller, *The Innovation Algorithm: TRIZ, Systematic Innovation and Technical Creativity*, trans. Lev Shulyak and Steven Rodman (Worcester, MA: Technical Innovation Center, 2000); Genrich Altshuller, *And Suddenly the Inventor Appeared: TRIZ, the Theory of Inventive Problem Solving*, trans. Lev Shulyak (Worcester, MA: Technical Innovation Center, 1996). More information on TRIZ is available at www.triz.org; B. E. Shlesinger, Jr., *How to Invent: A Text for Teachers and Students* (New York: IFI/Plenum, 1978); *Talents Unlimited* (Mobile, AL: Talents Unlimited, 1995).

[22] As John Dewey wrote, "…where children are engaged in doing things and in discussing what arises in the course of their doing, it is found, even with comparatively indifferent modes of instruction, that children's inquiries are spontaneous and numerous, and the proposals of solution advanced, varied, and ingenious." John Dewey, *Democracy and Education* (New York: Free Press, 1916), 156.

[23] American Association for the Advancement of Science, Project 2061, *Benchmarks for Science Literacy* (New York: Oxford University Press, 1993), 198-9.

SHOT 2004 CALL FOR PAPERS

ON

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Librarian for History and History of Science
Princeton University Library
Public Services and Collection Development Department

The Princeton University Library, one of the world's most respected research institutions, serves a diverse community of 6,600 students and 1,100 faculty members with more than 6 million printed volumes, 5 million manuscripts, and 2 million nonprint items. The holdings in its central library and 15 specialized libraries range from ancient papyri and incunabula to the most advanced electronic databases and digital collections. The Library employs a dedicated and knowledgeable staff of more than 300 professional and support personnel, complemented by a large student and hourly workforce. More information can be found at the Library's Web site: http://libweb.princeton.edu

Description: Princeton University library seeks an accomplished, energetic, and service-oriented professional to fill the position of Librarian for History and History of Science. This professional will be responsible for building upon the strong and often unique collections in these areas that are already at Princeton and for developing outreach programs that serve undergraduates, graduate students, and faculty working in all areas of history.

Responsibilities: This position has primary responsibility for providing services to Princeton undergraduates, graduate students, and faculty in History and History of Science and for developing and interpreting the collections in these areas. Princeton's History Department is large and active. More than 250 undergraduates, all of whom are required to conduct independent research, choose to concentrate in history. The graduate program enrolls 15 to 17 new students each year. Specific responsibilities include: outreach to faculty and students; developing a programmatic set of instruction and consultation services; creating and maintaining appropriate informational tools including a web site; current and retrospective collection building in all formats; management of a large acquisitions budget for history and the history of science, and an approval plan for Canadian materials; reviewing collections for appropriate preservation treatment and other maintenance options; oversight of collections in two graduate study rooms in Firestone Library. In addition, the History Librarian participates in direct reference service and collaborates with colleagues in branch libraries, Technical Services, and Rare Book and Special Collections to promote use of the wealth of original and specialized materials available to researchers in history at Princeton. This Librarian will be a member of the Public Services and Collection Development Department and will report to the Associate University Librarian for Public Services and Collection Development.

Qualifications: ***Required:*** Demonstrated academic strength in relevant subject areas, including advanced degree. MLS from accredited institution, or equivalent combination of education and professional experience. Minimum of three years successful experience in an academic research library. Knowledge of the book trade. Strong commitment to service. Demonstrated teaching ability. Demonstrated knowledge of bibliographic tools, including electronic resources, available for the use of historians. Excellent oral and written communication skills. Ability to work collaboratively and collegially with diverse groups. Comfortable with technology and open to learning new applications. ***Preferred:*** Reading knowledge of at least two European languages. Experience with developing web pages. Familiarity with digitization issues and standards. **Compensation and Benefits:** Compensation will be competitive and commensurate with experience and accomplishments. Twenty-four (24) vacation days a year, plus eleven (11) paid holidays. Annuity program (TIAA/CREF), group life insurance, health coverage insurance, disability insurance, and other benefits are available.

Nominations and Applications: Review of applications will begin immediately and will continue until the position is filled. Nominations and applications (resume and the names, titles, addresses and phone numbers of three references) should be sent as a Microsoft Word attachment via e-mail to libhrpro@princeton.edu, or by fax to (609-258-0454. Submissions via regular mail are also welcomed and can be sent to:

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