

NEWSletter

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of the History of Science Society

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Notes from the Inside

I decided to attend graduate school in the history of science while living in St. Croix, in the US Virgin Islands. My wife Becky and I were caring for abused and abandoned children – witnesses to the dark side of paradise – and I was also searching for a life's purpose. Although the job was demanding, there was time for reading and the library in Frederiksted contained a surprising variety of books. One that I happened across, still one of my favorites, was R.F. Delderfield's *To Serve Them All My Days*. It is the story of David Powlet-Jones, a British WWI veteran, who becomes a history teacher and who devotes his life to his students and his work. It is a touching tale – made into a memorable series by Masterpiece Theater – and it was Powlet-Jones' concern for his students and his scholarship that helped convince me to pursue a Ph.D. in history. That decision was cemented by my contact with Frederick Gregory at the University of Florida, someone whom I think of as an American equivalent to Powlet-Jones. Fred guided me not only with complete devotion to the history of science, but also gave me insights into the human condition, helping me see what it meant to be a good person.

This past year, I had the privilege of sitting in on Fred's last class, the end of 31 years at UF. As he called each student by name, I thought about the thousands of individuals who have witnessed his passion for the history of science, and it struck me that this was a time to be remembered. So I took some pictures, passed a card for the students to sign, and thought about all of the others in the HSS who have retired or who are about to retire and it prompted my desire to recognize these passages.

And so I invite contributions to a new section in the *Newsletter* titled, "To serve them..." It is intended as a remembrance to those individuals in the history of science who have influenced you in the classroom and beyond (many of our members are not teachers in the traditional sense). A simple photo with a caption or a few words will do. Or you may elaborate, provide a few sentences on the lessons you learned. Each life has signal moments. In this way, others may see those moments.

Jay Malone, Executive Director

NEWS AND INQUIRIES

University of Chicago Press Joins Current Scholarship Program

The University of Chicago Press and JSTOR announced that they will join forces in the Current Scholarship Program. Scheduled to launch early 2011, the program will bring scholarly content from leading not-for-profit publishers to a single integrated platform, making its use more innovative, efficient, and affordable for faculty, students, librarians and publishers.

The University of Chicago Press, one of the world's oldest and largest university presses, brings 51 titles to the program, including many of the most influential publications in the world. Both current and back issues will be accessible on the platform.

There are now 11 publishers working together as part of the program, and that number is rapidly increasing. With the addition of Chicago, the current issues for at least 150 journals will be available on JSTOR by 2011. This content will be accessible alongside the more than 1,100 journals with back issues on JSTOR today as well as a growing set of primary source materials from libraries and museums.

More than 6,000 JSTOR library participants worldwide will be able to license the current journals, either individually or as part of current issue collections, together with JSTOR back issue collections in a single transaction. The journals will also continue to be preserved in Portico, the digital preservation service that, along with JSTOR, is part of the not-for-profit ITHAKA. For more information about the Current Scholarship Program, see <http://www.jstor.org/page/info/about/programs/currentScholarship.jsp>.

Marjorie Howard Fatcher Digital Photo Collection Launched

The Osler Library of the History of Medicine and the McGill University Library are launching the online Marjorie Howard Fatcher Photo Collection at <http://digital.library.mcgill.ca/fatcher>. This is a series of close to 1,000 images arranged in two albums dating from 1890 to 1910 by Marjorie Howard Fatcher (1882-1969), daughter of the former Dean of the Faculty of Medicine and Osler's mentor R. Palmer Howard. The site contains a number of photographs of medical people, including Sir William Osler

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Moving?

Please notify both the HSS Executive Office and the University of Chicago Press.

EDITORIAL POLICIES, ADVERTISING AND SUBMISSIONS

The *History of Science Society Newsletter* is published in January, April, July, and October, and sent to all individual members of the Society.

The *Newsletter* is edited and published in the Executive Office. The format and editorial policies are determined by the Executive Director in consultation with the Committee on Publications and the Society Editor. All advertising copy must be submitted in electronic form. Advertisements are accepted on a space-available basis only, and the Society reserves the right not to print a submission. The rates are as follows: Full page (7 x 9.25"), \$625; Horizontal or Vertical Half page (7 x 4.6"), \$375; Quarter page (3.5 x 4.6"), \$225. The deadline for insertion orders is six weeks prior to the month of publication and should be sent to the attention of the HSS Executive Office. The deadline for news, announcements, and job/fellowship/ prize listings is firm: Six weeks prior to the month of publication. Long items (feature stories) should be submitted eight weeks prior to the month of publication. Please send all material to the attention of the executive office: info@hssonline.org.

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(1849-1919), Dean of McGill Medicine Francis Shepherd (1851-1929), and even Dr. John McCrae (1872-1918), later famous for his poem “In Flanders Fields.” It also illustrates the social life of a young, well-connected Montreal woman during the period. The site provides an insight into the intersection of the worlds of elite medicine and wealth. Viewers can virtually flip through the photo albums, replicating the experience of examining the originals and also seeing each picture in its larger context. For more information, please contact the Osler Library at osler.library@mcgill.ca or 514-398-4475, ext 09873.

Announcing HOPOS: The Journal of the International Society for the History of Philosophy of Science

At long last HOPOS has its own journal. Published by the University of Chicago Press, the first issue is scheduled to appear Spring 2011 in both print and electronic formats. The editors invite submission of article-length manuscripts to be published in *HOPOS: The Journal of the International Society for the History of Philosophy of Science*. We seek to publish the highest-quality scholarship on the history of philosophical discussions about science. The history of philosophy of science is broadly construed to include topics in the history of related disciplines, in all time periods and all geographical areas, using diverse methodologies. The journal aims to provide an outlet for interdisciplinary work, increase the already unusually high level of participation of international scholars in the history of the philosophy of science, raise the level of work in the history of philosophy of science by publishing scholarship that helps to explain the links among philosophy, science, and mathematics, along with the social, economic, and political context, which is indispensable for a genuine understanding of the history of philosophy. HOPOS scholarship is firmly concerned with situating philosophical understandings of science within the broader historical and philosophical settings in which they were developed, and against the backdrop of mainstream issues in philosophical thought, covering epistemological, methodological, meta-

physical, and moral issues relevant to the growth of our knowledge of the world and human nature. The journal does not limit submissions to HOPOS members. Scholars from all related disciplines are encouraged to submit to the journal. The length of articles is flexible, and all articles published in HOPOS are peer reviewed. Please see the HOPOS journal home page at <http://www.journals.uchicago.edu/toc/hopos/> for further information and for author instructions.

The Madame Heymann Optical Collection – rediscovered after 85 years

In the early 20th century Madame Alfred Heymann assembled the world’s greatest collection of eyeglasses and eyeglass cases, which disappeared right after she died in 1925. It has now been rediscovered and is now available digitally at <http://www.antiquespectacles.com>.

Post-event report: International Workshop on Lysenkoism

Portions of the International Workshop on Lysenkoism, held 4-5 December 2009 at the CUNY Graduate Center and Columbia University, were recorded by CUNY TV and are available online. To view, visit <https://bcc-cuny.digication.com/www.lysenkoworkshop.com/Welcome/published> and click on “Lysenko Workshop Live.” For further information on upcoming activities of the Working Group on Lysenkoism contact William deJong-Lambert at william.dejong-lambert@bcc.cuny.edu or WRL4@columbia.edu.

New Masters Program in Science, Technology and International Development: University of Edinburgh

The Science, Technology and Innovation Studies subject group of the University of Edinburgh announces a new Masters Programs in Science, Technology and International Development. This MSc program draws on the University of Edinburgh’s long-standing reputation for excellence in medicine, science and engineering.

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Based in Edinburgh, Scotland's vibrant capital and a UNESCO World Heritage city, the University is a home for science and technology studies, innovation studies and is a global hub of expertise in international development. As a student in our program you will have the opportunity to draw together options from one of the UK's largest groupings of high quality social science, taking advantage of all the resources one of the world's top universities has to offer. Here you will be able to build a degree that suits your regional, disciplinary and professional interests. This masters program is open to students and professionals looking to develop a deeper understanding of the complex dynamics of international development and how they play out in a global context. For further information: http://www.sps.ed.ac.uk/gradschool/research_masters_programmes/msc_r_science_and_technology.

New contact information for Technology and Culture

Technology and Culture has moved to its new home at the University of Oklahoma. Contact information for all new business, including submissions and correspondence is: techculture@ou.edu; Ph: 1-405-325-2311. Address: Suzanne Moon, incoming Editor-in-Chief, The Technology and Culture Editorial Offices, University of Oklahoma, Cate Center 4, 332 Cate Center Dr., Room 484, Norman, OK 73019, USA.

Johannes Kepler Working Group

This new C41/ICHA Working Group was created in October 2009 and will exist during the current triennium only. The Group was created because Kepler studies have reached a critical point with the demise in 2008 of the Kepler Kommission, which oversaw the publication of *Kepler's Collected Works (Gesammelte Werke)*. There are serious issues that threaten the long-term availability of that fundamental work; for example, several of the 21 volumes (including nearly all the vitally important correspondence) are now out of print, and – even more seriously – the

corpus of primary and secondary material that formerly comprised the Kommission needs to be given a permanent home that will ensure that this priceless documentation and library will continue to be made easily available to Kepler scholars in both their original format and electronically (the photostated manuscripts and library are currently housed in the Bavarian Academy of Sciences). These issues need to be tackled on a high-visibility platform, and this WG, first proposed during Special Session 9 (Marking the 400th Anniversary of Kepler's *Astronomia nova*) of the XXVII IAU GA in Rio de Janeiro, has been set up as the platform for such activities. The members of the Johannes Kepler Working Group are: T. J. Mahoney (Spain) [Chair]; A. E. L. Davis (UK); S. Dupré (Belgium); J. V. Field (U.K.); E. Hoeg (Denmark); G. Hon (Israel); A. Mosley (U.K.); J. M. Pasachoff (U.S); J.-C. Pecker (France); S. J. Rabin (U.S); B. Stephenson (U.S); J. Włodarczyk (Poland); and G. Wolfschmidt (Germany). For further information: http://www.le.ac.uk/has/icha/wg_jk.shtml.

Bakken Museum Honored with Leading Edge Award From Association of Science-Technology Centers

The Association of Science-Technology Centers (ASTC) awarded The Bakken the 2009 Roy L. Shaffer Leading Edge Award for Visitor Experience for its Science Assets-based School Partnership program on 31 October 2009 in Fort Worth, Texas. The 'Edgie' recognizes extraordinary accomplishments that not only enhance the performance of the institution, but also significantly advance the mission of science-technology centers and museums. The Bakken's Museum's mission is to inspire a passion for science. Because science and technology are rapidly changing the world in which today's students live and work, The Bakken developed the groundbreaking Science Assets-based School Partnership program in collaboration with the Minneapolis Public Schools to change how students think about and approach science. The program successfully builds upon children's creativity to help them develop confidence,

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receive support and understand that science is a meaningful part of their daily life. A team of Bakken educators visits the classroom, actively involving students in creative thinking and problem solving. As part of the program, children are introduced to 'People of Science' who help bring science to life in the classroom – such as a food scientist from General Mills whose job includes tasting cookies, and an engineer from Medtronic who uses Silly Putty to demonstrate his work with polymers. The School Partnership program also includes a professional development component. Participating teachers report increased confidence in teaching science. Positive outcomes have led to expansion of the program which will serve 2,700 district fourth graders and their teachers through 2011.

Ph.D. Dissertations in the History of Science

The most recent list of dissertations pertaining to the history of science can be viewed at: <http://www.hsls.pitt.edu/guides/histmed/researchresources/dissertations/index.html>.

Complete Set of the *Journal of the History of Biology* Wanted

Donald J. McGraw is seeking a complete (or nearly complete) set of the *Journal of the History of Biology*. Please contact him through his business website at: <http://web.mac.com/donaldmcgraw/Dr.DJM/Welcome.html>.

Samir Okasha Wins Lakatos Award

The London School of Economics and Political Science announces that this year's Lakatos Award, of £10,000 for an outstanding contribution to the philosophy of science, goes to: Samir Okasha (Bristol University), for his book *Evolution and the Levels of Selection* (Oxford University Press, 2006). He will visit LSE to receive the Award and give the Award Public Lecture during summer term, 2010.

2010 SAHMS Meeting

The 12th annual meeting of the Southern Association for the History of Medicine and Science

was held in Louisville, KY 5-6 March 2010 in the Conference Center of Jewish Hospital. SAHMS hosted over 70 lectures during this two day celebration of the history of medicine and science. The final program and registration materials can be viewed at: <http://www.sahms.net/HTML/2010.htm>.

InterUnion Commission of Astronomy Newsletter

The Inter-Union Commission for the History of Astronomy (DHST together with IUA) has re-launched its newsletter. You can find it at http://www.le.ac.uk/has/icha/documents/icha_news_09.pdf, and via <http://www.dhstweb.org>.

IHPST Newsletter

The latest newsletter of the IHPST group is now available on the Web at: <http://www.ihpst.org/newsletters.html>.

Opportunities for Scholars: Institute for Advanced Study, School of Historical Studies

The Institute is an independent private institution founded in 1930 to create a community of scholars focused on intellectual inquiry, free from teaching and other university obligations. Scholars from around the world come to the Institute to pursue their own research. Candidates of any nationality may apply for a single term or a full academic year. Scholars may apply for a stipend, but those with sabbatical funding, other grants, retirement funding or other means are also invited to apply for a non-stipendiary membership. Some short-term visitorships (for less than a full term, and without stipend) are also available on an ad-hoc basis. Open to all fields of historical research, the School of Historical Studies' principal interests are the history of western, near eastern and Asian civilizations, with particular emphasis upon Greek and Roman civilization, the history of Europe (medieval, early modern, and modern), the Islamic world, East Asian studies, the history of art, the history of science, philosophy, modern international relations, and music studies.

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Residence in Princeton during term time is required. The only other obligation of Members is to pursue their own research. The Ph.D. (or equivalent) and substantial publications are required. Information and application forms may be found on the School's Web site, www.hs.ias.edu or contact the School of Historical Studies, Institute for Advanced Study, Einstein Dr., Princeton, N.J. 08540 or at mzelazny@ias.edu. Deadline: 1 November 2010.

Cuban Society for the History of Science and Technology *Boletin*

Boletin No. 31 of the Cuban Society for the History of Science and Technology is now available as a pdf. Contact Jose Altshuler at jea@infomed.sld.cu for more information.

CFP: *The Brock Review*, "Animals in Human Societies"

The Brock Review is seeking scholarly essays and creative pieces for an upcoming issue on the theme of "Animals in Human Societies." This issue will focus on changing ideas about the use and treatment of animals in contemporary societies and the ethical, economic and political significance of animal rights. This issue will be co-edited by Dr. John Sorenson (Department of Sociology, Brock University). Possible topics might include: Animal/human bonds and mutual aid; Representations of animals; Animal rights and social justice; Veganism, abolitionism and the rise of "happy meat"; Normalization of speciesism; Animal rights and anarchism. *The Brock Review* is a peer-reviewed, interdisciplinary journal published by the Humanities Research Institute at Brock University. Scholarly essays submitted to *The Brock Review* should not exceed 25 double-spaced pages in length. Essays should adhere to the latest edition of the *Chicago Manual of Style* and include endnotes (where necessary) and a bibliography. Manuscripts should be original works and should not be published (or under consideration for publication) in another format. Manuscripts should be submitted via the journal Web site: <http://www.brocku.ca/brockreview> by 16 July 2010.

SciSIP Program Proposals, NSF

Proposals for NSF's Program on the Science of Science and Innovation Policy are due 9 September 2010. For more information please visit: http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=501084. If you have any questions, please contact the SciSIP Program Manager, Julia Lane at jlane@nsf.gov.

Summer 2011 – Call for Volunteers

The Center for the History of Physics at the American Institute of Physics is working on organizing a multi-day conference for graduate students and early career scholars interested in the history of the physical sciences to be held in Summer 2011 in Washington DC. If you are interested in volunteering or learning more, please contact Amy Fisher at afisher@aip.org.

In Memoriam: Stephen Toulmin

Stephen Toulmin, an influential philosopher who conducted wide-ranging inquiries into ethics, science and moral reasoning and developed a new approach to analyzing arguments known as the Toulmin model of argumentation, died on 4 December 2009 in Los Angeles. He was 87. The full *New York Times* obituary is at <http://www.nytimes.com/2009/12/11/education/11toulmin.html>.

**Join us in downtown
Montreal for the
2010 Annual Meeting
4-6 November**

MEMBER NEWS

Peder Anker recently published *From Bauhaus to Ecohouse: A History of Ecological Design* (LSU Press). Anker explores key moments of inspiration between designers and ecologists from the Bauhaus projects of the interwar period to the eco-arks of the 1980s, thus illuminating connections between humans and the built environment.

Bert Hansen, Baruch College of CUNY, was honored with the 2010 Ray and Pat Browne Award of the Popular Culture/American Culture Association “for the best single-authored work published in 2009” at its annual meeting in St. Louis for his book, *Picturing Medical Progress from Pasteur to Polio: A History of Mass Media Images and Popular Attitudes in America* (Rutgers University Press).

Angelina Long has passed her comprehensive exams with John Krige, Douglas Flamming and Steven Usselman. Her status in the School of History, Technology and Society at Georgia Institute of Technology is ABD.

Alain Touwaide, Historian of Sciences at the Smithsonian Institution and Scientific Director of the Institute for the Preservation of Medical Traditions, delivered a public lecture entitled “Why Does the Medicine of the Past Matter? Ancient Remedies for the 21st Century,” at the Virginia Commonwealth University, Richmond, VA, on Tuesday, 9 March 2010. More information visit: <http://medicaltraditions.org/institute/news/2-general/116-march-2010-events>.

John Harley Warner has been named recipient of the 2010 Graduate Mentor Award in the Humanities by the Yale University Graduate School of Arts and Sciences. The award is the University’s top honor for teaching, advising, and mentoring.



On 20 February, at the 2010 AAAS annual meeting in San Diego, the George Sarton Memorial Lecture was presented by **Jed Z. Buchwald**, the Doris and Henry Dreyfuss Professor of History at California Institute of Technology. The title of Professor Buchwald’s talk, given to an audience of around 140, was “Knowledge in the Early Modern Era: The Origins of Experimental Error.” Buchwald began by relating the origin of his interest in this topic to a book project currently under way in collaboration with his colleague Mordechai Feingold, on Isaac Newton’s last major published work, an attempt to redate the past using astronomical evidence. Their analysis of the details of that evidence has led to a new understanding of how data was treated before the development of modern statistical methods. Buchwald described examples of early modern methods for handling experimental error from published and unpublished work of not just Newton, but also of such varied figures as Descartes, Hevelius, Flamsteed, and Halley. He argued that instead of striving for averages, medians, or means as the closest approach to truth, the typical early modern natural philosopher tended to take a more artisanal approach, selecting for publication a single measurement that represented what he regarded as the one best performance of the act of measuring. The lecture succeeded in engaging both scientists and historians, and was greeted by warm approval of the audience.

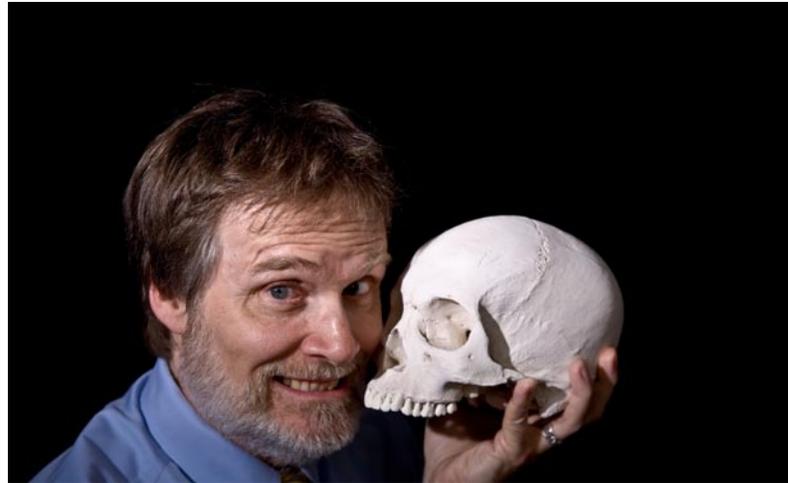
First Person

Disturbingly Historical: Reinventing a Museum

Poised between downtown Philadelphia with its Liberty Bell and Independence Hall and the University of Pennsylvania and Drexel University, a century-old Beaux Arts building houses The College of Physicians of Philadelphia. Flanking the entrance is a large banner advertising the Mütter Museum, a museum of medical history, as a “disturbingly informative” place. That a prestigious historical building – now a national landmark as “the Birthplace of American Medicine” – carries this edgy advertisement attests to an institutional reinvention of self. It also attests to the legacy of the late Gretchen Worden. During Worden’s tenure as museum curator and director, visitation increased from a few hundred to more than 50,000 annually. The Mütter Museum has become a cultural landmark for an audience that extends well beyond the medical cognoscenti.

The oldest professional society in the United States (founded in 1787), the College has aimed to improve the practice of medicine through a fraternity of elected Fellows, physicians distinguished in their work. The College remains a fellowship-based organization today but is creating new constituencies. In addition to the museum, the College maintains a Historical Medical Library of 325,000 volumes, and was once the pre-eminent medical research library in the country. Unlike the museum with its ebullient daily buzz, the library reading room is a quiet place, minimally staffed, seven floors of stacks hidden from view. The Mütter Museum may wish to inform disturbingly while the College builds a reputation as a cultural organization, but the library poses more of a puzzle in finding its 21st century place. The history of science lurks within the collections and informs the dialogue of institutional strategic planning.

Last year, the museum hosted a record 105,000 people, an increase of nine percent over the previous year. Despite this number, the College faced closure in 2005 for financial reasons. Since 2006, however, under the leadership of a new director and CEO, George



Robert D. Hicks

M. Wohlreich, MD, the College has been building its financial capital, obtaining grants, and announcing its presence in new domains. The College created Philly-HealthInfo, a Web-based outreach project to provide reliable health care information to the region. Dr. Wohlreich’s decision to recognize library and museum collections as mutually-reinforcing cultural resources led to my appointment in 2008 as both museum and library director. This decision was grounded in hard economic realities as the College trustees, before Dr. Wohlreich was appointed, reduced both museum and library staff.

The College is a heady environment with a full docket of programs and events, many sponsored by fellow-based special interest sections (on the arts and history, for example). The popularity of the museum daily brings requests to use the collections (25,000 objects) for art projects or use the College building as a venue for a conference or meeting. To the extent possible, I am trying to conflate practices regarding the library and museum collections, create exhibits involving both, and promote events that introduce the College to new audiences. On any given day, I must be prepared to engage with visiting scholars, host a tour for a medical association, deal with a leaky roof over the book stacks, speak to high schoolers about Civil War medicine, or negotiate with a funding organization. All business is conducted on the premise that the College and its collections command prestige owing to historical pedigree and historical scientific authority.

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“Historical scientific authority” deserves an explanation. The Mütter’s presentation of medical history benefits from and is a prisoner of its 19th century appearance. The 19th-century cases and a Victorianaesque organization of specimens resonate with a young public that relish the atmosphere. This mode of presentation, however, does not permit fabricated displays, interactive devices, or the special effects associated with science centers, and it does not facilitate displays of current medical technology. Yet the specimens and instruments of earlier eras, though evocative of extinct medical ideologies, still carry authority. In the 18th century bloodletting was a sanctioned therapy and in the early 19th antisepsis was not practiced, as reflected in wood-handled instruments. Audiences readily suspend scientific belief in acknowledging early medical practices as distinct from those of today, while at the same time reacting emotionally to what they see. Early obstetrical forceps provoke gasps; a moulage of a smallpoxed arm evokes a shudder; a two-headed fetus preserved in a jar elicits disturbing thoughts. These responses, however, make it easy to engage visiting audiences with a modicum of science history, an opportunity to communicate obsolete medical philosophies with an implicit comparison with modern practices. For more sophisticated audiences, including classes of university students or informal sessions with visiting groups of librarians, historians, or others with special interests, the need for comparisons with modern medicine recede and artifacts and specimens are discussed within anthropological and sociological contexts. Recently, for Elderhostel programs, visitors were taught artifact curatorship as a form of material culture study. This approach emulates the object



Mütter Museum displays retain a 19th-century appearance.

study approach described by David Pantalony (<http://www.hssonline.org/publications/Newsletter2008/NewsletterJuly2008photoessay.html>).(1)

Opening in 1863, the museum began life as an endowed teaching collection for pathological anatomy by a local physician, Thomas Dent Mütter. Lately, the museum has moved vigorously to renovate its more superannuated displays and create a new Web presence to exercise science history. With major funding from external sources, the College is creating an on-line History of Vaccines, under construction on the Web with a

multi-tiered, interactive timeline that examines the history of vaccines, with smallpox, diphtheria, and yellow fever as the diseases initially presented. The Web site represents the current best conflation of library and museum resources to tell a public health story, embedded within a history of vaccines. In response to a (funded) request from the City of Philadelphia to furnish a historical perspective on lead poisoning in Philadelphia, the museum created *The Devouring Element: Lead's Impact on Health*, which featured library and museum collections to explore our love-hate relationship with lead since antiquity. If outstanding funding proposals are successful, the central museum ambition

is to create a permanent gallery on medicine during the Civil War, the sesquicentennial of which begins in 2011. “With Tenacity for Their Lives”: The College of Physicians of Philadelphia and the Civil War, an exhibit resembling the look of the Army Medical Museum in 1865, will examine health, wounds, and disease through the experience of specific Fellows of the College during the war who distinguished themselves in war work. The museum’s central contribution to science history will be its dialogue with the public through exhibits and complementary Web materials.

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While the museum annually earns almost \$1 million in admissions income from people who want to see skeletons, medical models, viscera, and instruments within the atmosphere of a 19th-century medical cabinet, the library receives about 30 visitors monthly, with up to 3,000 accessing the collections electronically. During much of the 20th century, the library served as the Regional Medical Library, Mid-Atlantic Region. It was designated a historical library in 1996 formalizing its specialized function as a repository for the history of medicine. The change in status and fortunes of the library are reflected in journal subscriptions: the library subscribed to approximately 3,500 serials at its peak decades ago, mostly of a technical medical or scientific character, and now maintains about 20, exclusively in the history of medicine or science. Although the museum ceased accessioning medical works from 1990 on (except for historical scholarship), the change of status forced on the library by circumstances meant a reduction of staff in recent years, although the library has remained open and available. Since 2009, the library has been subject to strategic planning which will define its core collection, deaccession materials not relevant to the core historical assets, and create, through a major institutional partnership with leading libraries containing medical historical collections, an electronic portal to selectively digitized materials. The dialogue is in progress to define the algorithm or search protocol that will lead researchers to digitized archives, generally on the topic of infection, that reside within partnering institutions.

The library's moniker, Historical Medical Library, reflects how the College wants to position the collection within academic librarianship. The core collection will undoubtedly speak to Philadelphia-area medical history. Planning, however, has

unsettled some Fellows and created anxiety among some historians of medicine. They have not kept current with the huge challenges faced by all special collections libraries to retain "book collections" when the pressure has mounted to digitize materials. I and my colleagues have been criticized for referring to books as artifacts and cultural resources. Libraries are increasingly expensive; grants do not exist to save libraries from their electronic future; endowments are unlikely to support libraries according to a 1980 business model. Referring to books as artifacts does not diminish them but expands the discourse about their use. The College library collection, when defined through strategic planning with attendant de-accessioning of materials now abundantly accessible on-line, will be a different place. The library constituency, in fact, is already changing. Self-identified medical historians are relatively few. We are hosting an increasingly diverse constituency including teachers, artists, and even high school students. The



Exterior view of the College of Physicians of Philadelphia prior to 1920.

vigorous use of social media to create new pathways to the library collection also generates new interest from unlikely constituents. The most urgent message that older library patrons must understand is the same understood by historians of science plying their trade. That message is that the future of an historical library collection is inseparable from its on-line presence and accessibility. Scholars interested in medical history have many ways to learn about assets at the College library. Many assets, without an electronic presence (including finding aids), remain underused or unknown.

Thomas Söderqvist, who directs the University of Copenhagen's Medical Museion, has outlined the challenge to the future of medical history museums. The older specimens and tools may have immediate

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emotional resonance with audiences, but 21st-century medical techniques and technology, hugely relevant to people's lives, are very difficult to display. He asks whether traditional museum displays will even be possible when museums tell the story of biomedicine.⁽²⁾ He has also provoked a conversation on wider participation in museum curatorship through a distributive model which uses "crowdsourcing."⁽³⁾ That the College collections continue to promote a 19th-century ambiance suits one huge constituency knocking at the door: the visual arts. In 2010, the museum opened a guest-curated exhibit, *Corporeal Manifestations*, featuring newly-commissioned ceramic figurative work which explores the psychology of our biological existence. Further, a College Fellow has promised recently to fund the renovation of another large space adjacent the museum to permit the installation of exhibits of photographs or works on paper, thus creating an exhibition gallery. Laura Lindgren, publisher of Blast Books, produced two briskly-selling books about the museum and its photographic collections, and the popular annual calendars. Her work in courting major photographic artists has given us international authority within the visual arts (see: <http://www.blastbooks.com/>). At this writing, with Ms. Lindgren's help, we are seeking support to commission a film by the Quay Brothers, an artists' meditation on our collections. We are also participating in an exhibit, *Anatomy/Academy*, conceived by the Pennsylvania Academy of the Fine Arts that will "focus on how Philadelphia's dynamic art and science communities fostered knowledge of the human body," to quote the prospectus. This engagement with the arts permits an exploration of how the histories of medicine and the visual arts intertwine and allows the College to exhibit and interpret its stunning collection of anatomical atlases.

Surrounding all of these projects are social media. Happenings at the Mütter Museum are followed at Facebook, Twitter, Flickr, and YouTube. We have enjoyed particular success with our YouTube program, *No Bones about It*. This program, which I host, includes interviews with authors, artists, and others who give lectures or hold events at the College, and

has become a popular adjunct to museum programs. A relatively low-cost way to promote the collections, *No Bones* has already, in a half year, attracted more viewers than any other comparable program run by Philadelphia museums. The fact that our most popular episode has me feeding my pet medicinal leeches on my blood may have something to do with it. Increasingly, the College's presence via social media will become more vigorous and extensive and will connect substantially with the study of library and museum collections.

The College's claim on the history of science is multifaceted and evolving. This claim invites scholars who wish to use library materials for traditional research, but it also elicits interest in multidisciplinary uses of all College collections for projects that may challenge or provoke public perceptions of the human body, disease, or mortality. The history of science can be found in our photography collection, exhibits, or Web material involving imagery of the body, medical discourse, or the social history of disease. It can even be disturbingly historical.

Robert D. Hicks is director of the Mütter Museum/Historical Medical Library and William Maul Measey Chair for the History of Medicine.

Contact him at: rhicks@collegeofphysicians.org

Web links

The College of Physicians of Philadelphia
<http://www.collegeofphysicians.org>

Travel grants

<http://www.collphyphil.org/ERICS/Resfels.htm>

- 1 "What is it? Twentieth-century Artifacts out of Context," *History of Science Society Newsletter* 37.3 (July 2008).
- 2 Thomas Söderqvist, Adam Bencard and Camilla Mordhorst, "Between Meaning Culture and Presence Effects: Contemporary Biomedical Objects as a Challenge to Museums," *Studies in History and Philosophy of Science* 40 (2009): 431-38.
- 3 Thomas Söderqvist, "The Participatory Museum and Distributed Curatorial Expertise," *Zeitschrift für Geschichte der Naturwissenschaften, Technik und Medizin* (2010, forthcoming).

Teaching Tricks

While much time and effort has been spent on curricula in the history of science, less effort has been devoted to how to draw students into the history of science and keep that fascination going after graduation. Four teachers here describe their approaches to teaching history of science.

The history of science at the center of education

Peter Pesic, St. John's College, Santa Fe, New Mexico

At St. John's College, all students study the history of science, which comprises almost half of our all-required, four-year curriculum based on the "great books." We look at nature, through observation, and at ways of looking at nature, through seminal texts. Our students read the original writings of Aristotle, Newton, Maxwell, and Einstein, with all the difficulties, challenges, and rewards involved. We work in tutorials in which about fifteen students, guided by a faculty member, undertake the work of presenting mathematical demonstrations at the board, discussing the texts and their implications, doing laboratory experiments, and engaging in field work. All our faculty are involved in leading these classes, regardless of our previous specialties; we consider ourselves "tutors" -- experienced learners, not experts or professors -- and often our most exciting classes involve faculty who are learning the material along with their students, creating an environment in which teacher and pupil are freshly struck with what is strange or deserving of question. Questioning is our primary activity, even more than assimilating or articulating the arguments of our texts, each of which may be an answer whose underlying question needs to be sought and pondered.

We coordinate our work between parallel tutorials in laboratory and mathematics, which also includes mathematical astronomy and physics. We maintain a long-standing conviction that all students can do math -- even those who had previously professed themselves averse or even unable -- if approached in the way we do, as one of the primary symbolic forms of human expression, rather than as

a body of technicalities considered as beyond question. Euclid's *Elements* provides the perfect starting point for freshmen to learn as they demonstrate his propositions at the board, which leads many who thought they "hated math" to see its depth and beauty. We continue with Ptolemy into sophomore math; close study of the details of his theory helps students read Copernicus and Kepler with real surprise; this transition is a centerpiece of our consideration of the subtle relation of "ancient" to "modern" thought. Apollonius's *Conic Sections* returns the students to geometry with ever-growing richness, leading to the transition to algebraic mathematics when we study Viète and Descartes. Junior Mathematics considers the development of the calculus from Galileo to Leibniz and Newton (the mathematical lemmas and astronomical propositions from Books I and III of the *Principia*), before reconsidering the continuum via Euler and Dedekind. Senior Mathematics centers on a close reading of Einstein's 1905 special relativity paper, followed by a return to plane geometry via Lobachevsky, whose contrast with Euclid is richly thought-provoking.

Our Laboratory tutorials study how modern science came to be and whence comes its claims to authority, especially in relation to the claims of ancient Greek science, which we take very seriously in itself, rather than merely as a precursor or outmoded rival. Freshman Laboratory begins with observational biology: students observe a square meter of meadow as closely as possible; later they consider how to classify the various species of conifers in our mountains. Returning to the classroom, we read Aristotle's delineation of what constitutes a species and consider how he approaches the question we had just confronted among the trees. We go on to follow the development of observational biology, beginning with chicken eggs and sea urchin embryos

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and finishing by dissecting cats. The whole project is crucial to understanding Aristotle's approach, his careful, respectful contemplation of the natural world, which we extend through reading related works by Goethe, Thoreau, and Linnaeus.

Here and throughout, the Laboratory constantly turns to bench work that requires hands-on experience. Archimedes' text comes to greater life when we watch the crown immerse and feel for ourselves what "Eureka!" may have meant. A series of chemical experiments and readings open up the question: do atoms really exist? We suspend what we thought we "knew" about atoms, in order to confront these elemental questions without prejudice, rather than as the *fait accompli* most textbooks present. Thus, we do not study the "results" of science as much as participate in the process of scientific inquiry itself.

Junior Laboratory begins with mechanics following Galileo's *Two New Sciences*, Huyghens, Leibniz, and Newton's *Principia* (the Laws and mechanical propositions in Book I), followed by optics (Fermat, Leibniz, Newton), and electricity and magnetism. There, Faraday is the ideal guide, accompanied with many experiments, leading to the challenging project of studying sections of Maxwell's *Treatise* (with extensive notes), keeping in mind his claim to set forth in mathematical notation the physical insights of Faraday and leading to Maxwell's equations and electromagnetic waves. The first semester of Senior Lab considers the development of atomic and quantum theory through classic experiments and readings from Faraday, Rutherford, Bohr, Planck, Schrödinger, and Heisenberg. In the second semester, after close discussions of Darwin's *Origin of Species*, we follow the development of genetics from Mendel through Avery and the structure of DNA, ending with Jacob and Monod on gene regulation. These readings are accompanied by experiments in pea and fruit fly genetics, along with a sequence of classic bacterial experiments.

This historical approach via original texts helps our students develop a deeper appreciation for mathematics and science through discussing fundamental questions and experiments. In response,

our students' questions reach out in philosophical, literary, and artistic directions: How can a single vibrating string produce many overtones at once? If all is relative, does the earth really go around the sun, vice versa, both, neither? What does it mean to understand nature via forces, fields, atoms, if those entities defy visualization and hence comprehension? Can life be understood through the "language" of the genetic code? What happens when science renounces all vestiges of anthropomorphic thinking? Once such deep questions are really broached, they resonate in the mind, initiating a life-long journey of reflection and dialogue.

Continued next page

The history of science for science students

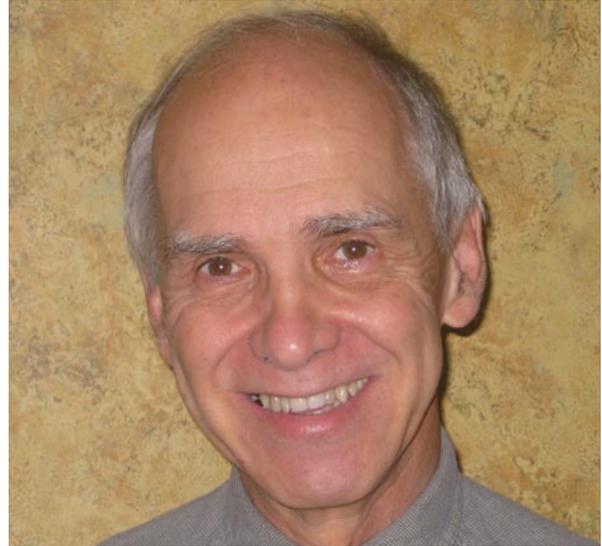
Frederick Gregory

Professor Emeritus, University of Florida

The easiest students to attract to the history of science for me have always been science students, whether undergraduate or graduate. An unofficial tabulation of where our majors in history of science have come from would, I believe, show a healthy number come from the sciences, often students who have started out as a science major but then switched to history of science. But even those science students who remain in their majors present the instructor with a natural means by which to entice them to cultivate an interest in our field – their specific discipline. The question becomes how to make use of their already existing interest in science.

One way is to enlist the aid of science majors in presenting material touching on their discipline in the form of an individual lecture. Although the student's presentation may be based on a longer written assignment for the class, it is important that the student's time before the class be special, not part of a required series of presentations that all students in the class must make. This means that you as professor have to inform yourself about the majors of the students in the class and then seek out two or three who are advanced and who are performing well. In an individual meeting, explain why you are requesting that they take on the particular assignment. Of course, you could also solicit from a student an alternative topic should the one you suggest not prove of interest.

So far there has not been anything all that different from what many might already do. But an additional step can make a big difference in bringing attention to history of science. If the presentation is not to be too long, or if it could be given in a shortened form, volunteer to contact a colleague who is teaching a science class the student is currently taking to see if the professor might also permit the presentation be made in that class. In this way you



have not only cast the student in your class as an ambassador for history of science, but you also bring the subject (and your course) to the attention of a whole different group of science students.

The challenge of selecting appropriate topics more or less solves itself for courses whose subject matter is narrowly focused. A class on the history of electricity, for example, presents physics students with a host of possibilities to investigate. For courses on the history of zoology, botany, geology, astronomy, or even more specialized scientific disciplines there are also any number of standard topics one would naturally cover that could be used to entice students to become spokespersons for our field.

In the survey class the challenge becomes a bit greater since there is less flexibility, but in general the same approach can be used. The above tactic can, of course, be adapted easily to majors in disciplines from the humanities and social sciences as well.

Use things!

Joe Cain, Department of Science and Technology Studies, University College London

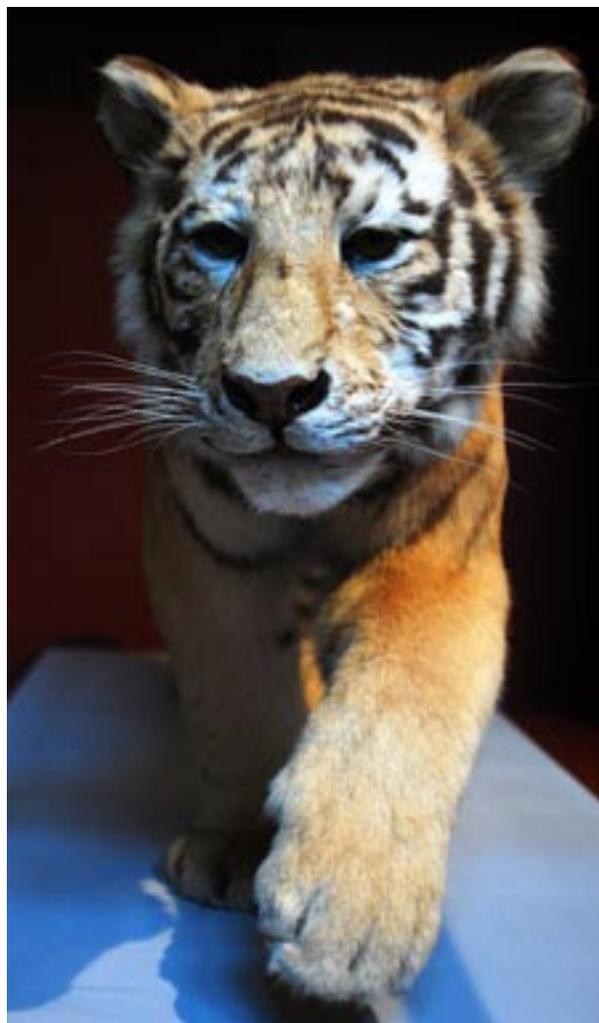
Object biography is proving an effective technique for developing history of science interests among novices at the undergraduate level.

The basic method is simple. Select an object. Pose a theme, question, or point-of-view. Then, set students to work investigating. As the tutor, my role is to keep supplying fuel: directive questions, pointers to new sources, contacts with expertise, and a sounding board for those moving through the problem-solving process. Sometimes students stumble. That's when I step in to pick them up. Sometimes, they digress into useless tangents. That's when I impose some navigation.

As an example, this year I have students investigating intellectual, material, and social/cultural associations links to natural history objects found in my university's zoological museum. One student wanted to find out more about some dodo bones on display; another, a mid-19th-century embryological model showing chick development. And so on. (I offer suggestions, but ultimately, they choose.) For museum staff, not much is known about many of the specific items on display, though they usually have several threads at the start. That the curators want to know more always proves important. It means they make time in their overloaded schedules to help, and it means their interest in the work shines through to the students. This is research with a real audience.

Research normally follows several lines of inquiry:

- provenance and context of display – What precisely do we have? Where did it come from? How did it come to be here? Describe its display both narrowly (pose and interpretation) and broadly (what ideas are on display here; has this display always been as it is now?). Properly draw, describe, or photograph it. Retrieve/revise existing catalogue information and accession records.
- construction – Follow translation from raw original to curated object. What did preparation entail? What did construction entail? What ideas are embedded in the constructed display? Who undertook this work?



What relations exist between producer and consumer?

- intellectual history – Follow literary and illustrative traces for these objects both in print and in archives. How is it used? Identify differences in interpretation. Follow knowledge webs both about the object and about the interpretations built upon these objects. Start with naming and classifying.
- communal dimensions – What can we learn about the people producing and consuming the object? Follow relevant social, political, gender threads in these questions. Follow changing interests and fetishes.
- cultural life – Place the object in wider social/cultural contexts, especially in use. Investigate changing value, symbolism, and associations. Relate to parallel themes in other subjects.

These projects work best on year-long, rather than single term, scales simply because they exploit an “investment paying dividends” model of work. Hard

descriptive effort and sustained archival digging can be done well in one term. But confidence building takes time. So does reworking and digestion along multiple tracks. If a term is all that's available, focus investigation along a single track, such as demonstrating embedded theory or following gender/class/rank dimensions concerning who's doing the work.

Object biography is useful for some pedagogical goals, but it's not an all-purpose tool. If the aim is to develop comprehensive knowledge of a subject or to develop critical skills in argument and reasoning, then object biography will prove a poor tool. In contrast, it offers an effective means for developing research skills and integrative thinking. Handling objects and artefacts (including archive materials) taps into memory and cognitive pathways otherwise poorly served by typical essay assignments asking for the compression of a few academic papers. It doesn't seem to matter if students are novices in history of science or have prior experience in the subject. My own preference is not to cherry-pick high achievers for this work. I find object biography quite useful for skill development in otherwise average performers. The common denominator seems to be an appeal to students bored by (or not particularly good at) memorizing and other low-level cognitive chores. It also appeals to risk-takers and those eager to center the content of their learning around their own sense of relevance. Importantly, object biography concentrates on skill deployment as much as skill development. For those focused on portfolio and cv building, the creation of useful finished projects, showing them at their independent best, can serve as a key endpoint justifying their time and dedication.

The long term effect of object biography seems to be instilling confidence in students' analytical capabilities and their own critical interpretative voices. It helps them understand at a deep level (and demonstrate) how facts in the world around us come only through processes of construction and intervention.

Object biography is not new. Alberti (2005, *Isis* 96:559–571) is the tip of the iceberg. It certainly offers promise as one tool in our pedagogical arsenal. It's especially useful when the goal is integrative and penetrating thinking.

Magic, Science, and Religion

Margaret J. Osler, University of Calgary

When I first arrived in Calgary in 1975, two of my colleagues were offering a one-term, second-year course on Magic, Science, and Religion in Europe developed in response to the popular culture and widening scholarship of the late 1960s and early 1970s. Within a couple of years, one of these colleagues had moved on and his part of the course fell to me. Eventually, I took over the entire course. As I developed lectures, I felt overwhelmed with the volume of relevant material, and in the early 1980s I expanded the course to a two-term sequence. Demand grew, and I now cap enrolment at 125 students per term.

The first term of the course covers the period from Augustine to Galileo; the second from 1600 through 20th-century debates about scientific creationism. While it is no substitute for the history of science survey, it is now the entry-level course in my history of science sequence that includes the survey and a variety of more specialized, seminar courses.

My version of this course focuses on the development of ideas and intellectual issues. The guiding principle is the notion of conceptual frameworks. Rather than providing essentialist and anachronistic definitions of – “magic,” “science,” and “religion” – I try to make the point that different ways of understanding the world rest on different assumptions about what kinds of entities exist in the world, how these entities interact, and how we can know about them. For each topic, I analyze the assumptions underlying different views of the world and the broader reasons why thinkers have adopted one set of assumptions or another in particular historical contexts. I also make the point that the relationships among these conceptual frameworks is far more complicated and diverse than that of conflict, and that the history is not a Manichean story of the light of reason triumphing over the forces of darkness and superstition.

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Instead, I focus on examples of interaction and interpenetration, and I examine ostensible conflicts carefully to see exactly what was at stake between the conflicting parties.

As background to the first term, I spend two weeks of lecture describing the major themes of the Judaeo-Christian and Greek background to Western intellectual history – the basis for considering the sometimes-uneasy marriage between Athens and Jerusalem. Topics discussed, however briefly, include various schools of pre-Socratic philosophy, Plato, Aristotle, Epicureanism, and Stoicism, as well as basic ideas in Old and New Testament religion, including the concepts of God, creation, providence, salvation, and the Apocalypse. (Surprisingly for conservative Albertans, many students have no notion either of the main tenets of Christianity or of the Bible.)

The first substantive unit deals with the development of the concept of witchcraft from Augustine's opinion that witchcraft belief is illusory to the full blown concept of witchcraft as a pact with the Devil articulated in the *Malleus Maleficarum* in the late 15th century. The thesis of this part of the course is that witchcraft involves magical practices (or accusations of such) but that witchcraft itself, in the medieval Christian context, is not magic but perverted religion.

The second term, running from 1600 through the late 20th century, is organized around the changing relationships between science and religion. The 17th century is a time when theological considerations play a major role in the choice of a new philosophy of nature. During the 18th century, the positions of reason and religion become reversed, and reason emerges as the universal criterion. During the 19th and 20th centuries – especially after Darwin – science displaces theology as the starting point for discussions of human nature.

Because the course draws students from all over the university, I cannot assume any relevant background or a willingness to read overly technical material. Because class size is so large, I lecture. If one could teach this course with smaller sections or at a more advanced level, it would lend itself well to a discussion format and the use of primary sources.

Many different kinds of students are attracted to this course. Over the years I have encountered covens of witches, practicing Hermeticists, New Age feminists, positivist scientists, and fundamentalist Christians.

This is extracted from an article that first appeared in the HSS Newsletter, April 2002. For the full article, please go to http://www.hssonline.org/publications/Newsletter_Archives/2002/HSSNewsletterApril2002.pdf, pp. 4-5

Teaching Disagreements in Science and Math

Alberto A. Martínez
University of Texas at Austin

At the University of Texas at Austin, the UTeach program trains students majoring in science or mathematics to become teachers. It requires one historical course titled: “Perspectives on Science and Math.” The version that I have taught to nine groups over the past four years is now being replicated in 13 other universities, with more underway; and additional course materials are being prepared by Abigail Lustig. The replication labors are directed by the UTeach Institute, thanks greatly to a grant of \$125 million from The Exxon Mobile Foundation, plus support from the National Math and Science Initiative, the Bill & Melinda Gates Foundation, the Michael & Susan Dell Foundation, the Texas Instruments Foundation, and several other state and national agencies.

The Perspectives course is one of nine courses in this teaching certification program. Nearly none of our students have taken other courses in the history of science. At first, many seniors resent having to take yet another requirement and they doubt that there is any real way in which history might help their future work as teachers of science or math. Moreover, many math students presuppose no connection between their field and the sciences: “Why should I have to study biology and physics? I’m a math major.” Nevertheless, my most successful strategy to gain their interest has been to portray the elements of science and math as interdependent and unfinished, open to critical analysis, by tracing historical episodes in which scientists have intensely debated topics we now take for granted. The same holds for mathematicians, as our incoming students know no example of mathematicians ever disagreeing about anything.

Among the topics that trigger most debate and discussion are the following: rules on negative numbers, division by zero, the Monty Hall game show

problem, definitions of species, eugenics and Belyaev’s foxes, $1 = .999\dots$, Platonism versus formalism, the prisoner’s dilemma, and myths about the Golden Ratio. My main goal is to spark curiosity that will lead students to pursue history on their own. To trigger discussion I carry out preliminary surveys on what students think, to later get them to argue their perspectives, and to connect with viewpoints of past scientists and mathematicians.

If not strictly required, many students will postpone reading until just before an exam. Therefore, I give brief reading quizzes for every single reading. But finding suitable readings has been a struggle. Primary sources, such as by Galileo or Darwin, lack appeal for these students. Solid historical works lack the entertainment value of popular science books, which lack reliability. I’ve increasingly assigned excerpts of books, along with historically informed yet popular essays, and I have written articles to hand out. Rather than assign exhaustive works, I find it better to assign lively readings and to expose defects in class. By highlighting critical and progressive dimensions, students enjoy the sense that history involves inquiry. Finding variations in historical accounts, students become compelled to turn to primary sources.

We also analyze schoolbooks on science and math, looking for historical elements, to pinpoint myths and shortcomings. As future teachers, students appreciate the growing sense that they can be “above the textbook” – able to correct passages that are wrong. These students lack interest in scientific societies or institutions, but they enjoy stories about interesting individuals: such as Pascal, Wegener, and Galton. Thus, one way to capture students’ attention is to study aspects of popular books, even bestsellers, and to seek in history factual elements that resonate with the captivating forms of popular stories.

By the end of the course, students’ views on history have improved greatly. They write: “I’ve never taken a course like this before. I love that everything that we’ve learned as the ‘foundation’ of math or science in the past has a more interesting back story,” and also, “This is by far my favorite class of college.

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It was so interesting and taught in a completely different way than I've ever experienced. It changed the way I view the impact of teaching."

In July 2009, President Obama praised the UTeach program in a White House press release on education, and now again, in January 2010 the President commended its national expansion in his "Educate to Innovate" Campaign. Six new UTeach replication sites have now been announced, bringing the total to nineteen: University of California at Berkeley (Cal Teach), University of California at Irvine (Cal Teach), University of Colorado at Boulder (CU Teach), University of Colorado at Colorado Springs, University of Florida (FloridaTeach), Florida State University (FSUTeach), University of Houston (TeachHOUSTON), University of Kansas (UKanTeach), Louisiana State University (Geaux Teach), University of North Texas (TNT), Northern Arizona University, (NAUTeach), Temple University (TUteach), University of Texas at Dallas (UTeach Dallas), University of Western Kentucky (SKyTeach), University of Tennessee Knoxville (VolsTeach), Middle Tennessee State University, University of Texas at Arlington (UTeach Arlington), University of Texas at Tyler, Cleveland State University. Each of these universities needs (or already has appointed) qualified instructors to teach the Perspectives on Science and Math course. A problem, however, is that some of the schools might hire instructors from education, philosophy, or the sciences who lack the specialized knowledge of our field. To that end, job candidates should directly contact programs of interest to inquire about possible opportunities, or, you may write to info@UTeach-institute.org, addressing your email to Kim Hughes, who will refer you to the appropriate site coordinator.

http://www.utexas.edu/news/2010/01/07/uteach_expansion/

<http://www.uteach.utexas.edu/>

<http://www.uteach-institute.org/>

In 2011, HSS will meet with SHOT and 4S in Cleveland, Ohio, 3-6 November. Please plan on joining us for what promises to be a spectacular meeting.

Program Profile, Georgia Institute of Technology

When was your program established and how has it developed since its inception?

The graduate program in the School of History, Technology and Society was established around the time that Mel Kranzberg retired in the mid-1990s. Kranzberg was a founding father of the Society for the History of Technology. A named chair was created in his honor that was filled first by Bruce Sinclair and then by Phil Scranton. John Krige was recruited to fill the position in 2000, and is currently both the Kranzberg Professor and the Director of Graduate Studies. Since his arrival the Chair has also benefitted from financial support from the B. and B. Stern Foundation which funds travel for the incumbent and a large variety of graduate student activities, including a Kranzberg Graduate Fellow.

The program in 2000 included historians of technology Michael Allen, Gus Giebelhaus, and Steve Usselman and historians of science and technology Ken Knoespel and John Krige. Our senior historian of medicine was Andrea Tone while Mary Frank Fox and Sue Rosser worked in the domain of women, science and technology. Willie Pearson joined the program in 2003 and brought his expertise and national reputation on questions of race, science and technology. Additional sociology strength was provided by Maren Klawiter (sociology of medicine), Amanda Damarin, who works on the social implications of the Internet, and Bill Winders

(agricultural policy). Two years ago it was decided to make the graduate program the signature program of the School, and to strengthen the sociology component. In response we recruited three new faculty members: Wenda Bauchspies (science, technology and development), Kristie Macrakis (history of science, German history), and Jenny Smith (environmental history, Russian history).

Currently the core teaching staff on the graduate program is Bauchspies, Damarin, Frank Fox, Knoespel, Krige, Macrakis, Smith, Usselman and Winders. Faculty profiles may be accessed at the link below.



HTS's new home in the Old CE Building, which is equipped with a graduate lounge and kitchen, and individual workstations.

What are the comprehensive exam fields?

The program now has separate tracks in history and in sociology of science and technology. It prides itself on being interdisciplinary – indeed most of the faculty in the School are historians. For graduates in the history track a field in the history of science and/or technology is obligatory. So too is a field in one of American, Asian, or European (including Russian) history. Students are free to choose their third field in HTS in line with their dissertation topics. Alternatively they can choose a field offered elsewhere in the Ivan Allen Liberal Arts College – typically in International Affairs or Public Policy.

What are the faculty, program, and resource strengths?

This is, first and foremost, an interdisciplinary program. While our core mission is to train competitive graduates in the history (and sociology) of

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science and technology, we are emphatic that they be able to contextualize their research in dialogue with other fields in history. We also remain sensitive to the vagaries of the job market. For example, students entering the history track next year will do a mandatory course in Global History. We now have a graduate course in Museum Studies. We encourage students in the masters program to obtain a Certificate in Public Policy (12 credit hours). We have also just joined the ST Global Consortium that will provide opportunities for graduate students to link with their cohort in other schools in the U.S. and abroad, as well as with the AAAS and the National Academies.

We currently have 10 full time and about the same number of part-time students enrolled in the program. Our support for full-time students covers four years. A number of measures have been taken to help them to be competitive for external support at all stages of their academic career. Progress through the program requires meeting milestones intended to ensure that students remain focused on their academic goals. They are encouraged to get involved in research as soon as possible, to give papers at conferences of their professional societies early on, and to apply for external support whenever it is available. Many MS and ABD students also teach as adjuncts either in the Atlanta area or in one of Georgia Tech's many study abroad programs in the summer.

To date our Ph.D. students have found jobs that fitted their interests and exploited their graduate education. Three of them filled postdoc positions, both in the U.S. (at MIT and Yale) and abroad (at Imperial College, London). One of them won the 2008 Patel award for the best Ph.D. on modern India in any U.S. university. Prakash Kumar is an Assistant Professor at Colorado State University while Tim Stoneman is a Visiting Assistant Professor at Clemson University. Yu Tao is an Assistant Professor at Stevens Institute of Technology, and Patrick Zander teaches at Reinhardt College in Atlanta. Other graduates have found employment in academic administration, in museums, and in state, federal and national bodies.

What are some recent dissertations that have been produced by graduate students?

Prakash Kumar, Facing Competition: The History of Indigo Experiences in Colonial India, 1897-1920

Chris McGahey, Harnessing Nature's Timekeeper: A History of the Piezoelectric Quartz Crystal Technological Community (1880-1950)

Jahnvi Phalkey, Big Science, State Formation and Development: The Organisation of Nuclear Research in India, 1938-1959

Olivia Scriven, The Politics of Particularism: HB-CUs, Spelman College, and the Struggle to Educate African Americans in Science, 1950-1997

Tim Stoneman, Capturing Believers: International Radio, Religion, and Reception, 1931-1970

Yu Tao, The Earnings of Asian Computer Scientists and Engineers in the U.S.

Patrick Zander, Right Modern: Technology, Empire, and Britain's Extreme Right Wing in the Fascist Era (1919-1940)

More information on the faculty in the School can be found at www.hts.gatech.edu/faculty/. News on the program and from graduate alumni is available at www.hts.gatech.edu/documents/newsletter_09.pdf. The graduate program is described in more detail at www.hts.gatech.edu/graduate/ where a copy of the handbook is also available.

Feeding a War: Q & A with Daniel Ragussis

Daniel Ragussis wrote and directed Haber, a short film on the German chemist Fritz Haber (1868–1934). Haber won the Nobel Prize in chemistry in 1918 for developing an economical process for synthesizing ammonia from atmospheric gases, which could then be used to make synthetic fertilizer, yet became infamous for pioneering the use of chemical weapons during World War I

What drove you to make a film about Fritz Haber?

I heard about Haber in 2001 or early 2002. I saw a Discovery Channel special on him and immediately became obsessed. One of the things I love about the story is its massive historical sweep. It's about the invention of weapons of mass destruction, the power of science, and the world at an incredible crossroads, but it's also a personal and intimate story about Haber as a human being and his relationship with his wife.

Which historical issues did you choose to focus on?

One of the huge challenges I faced was that I had only 34 minutes. In the end I decided to focus on one moment in time, when he confronted the dilemma about chemical weapons. I was fascinated by the power that science has—the way that scientists can be called upon to produce that power at times of incredible need and how that power can be used and sometimes abused. At the time, most Germans saw themselves in a fight for their survival; so when Haber had the opportunity to help the war effort through the use of poison gas,

he saw it as an opportunity to save his country and his fellow men. The Haber-Bosch process produced fertilizer that helped to feed the world—so I was fascinated by a man who had done these wonderful things, yet was then willing to create a weapon for the good of his country. One of my objectives was not to make any judgments about Haber, but to explore the situation and his decision and let the viewers judge what they thought the right and wrong of it was.



What would you have liked to include, but couldn't?

Nuances about Haber's decision, the time period, and more details about his wife, Clara. I'm working on a feature-film version, so I will have the opportunity to include these then. In the feature version a major supporting character is Einstein, who was a friend of Haber's. Also I'll include more of his relationship with Clara, which is the emotional part of the story where you see and feel the impact of Haber's decisions. There's no conclusive evidence as to exactly why she killed herself. She committed suicide

the night before Haber was due to leave for the Russian front, and she did it in the garden—part of the Kaiser Wilhelm Institute—a fairly public place.

The combination of Clara's suicide, its location, and its timing point to the fact that she was terribly opposed to what Haber was doing and killed herself in protest. But there were other grave problems in their marriage as well. When they married, she was one of the first women in Germany to get a Ph.D. in chemistry. Haber proposed, and she accepted, the

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idea that they would have a dual career. His career quickly took off, but they had a son and not a lot of money and no servants, so her career came to a halt. It was terribly upsetting to her.

What struck me about Haber is that he thought in big historical terms, in big actions. He made decisions with big consequences and wasn't always sensitive to the personal and human side of things. He could make a decision like inventing chemical weapons to save Germany, end the war, and save millions of lives without looking at the personal ramifications of the people getting gassed and the implications for his own life. Clara is a foil in that sense—someone who is rooted in the personal and tries to remind him of those concerns.

You have a fascination with science. Why is that?

At the ACS [American Chemical Society] presentation of the film [on 18 August 2009], one of the issues that came up is the ethical responsibility that a scientist bears. Someone said, "Why is this responsibility any different than a chef who makes food used to feed soldiers?" My answer lies in the difference between what a scientist does and what a chef does. A scientist's work changes the whole nature of the game—the rules we have to live by. The fascinating thing about science and scientists is that they alter the nature of reality. What is possible changes. We see that every day in how we communicate and how we get resources. How can that not have an ethical component?

How do you balance telling an accurate history with creating a compelling narrative?

My goal is that after viewing the film, audience members will have roughly the same sense of the people and the events that I have after doing all the research. Some details may have to be changed, and that's always a tough decision as I want to stay as true to the details as possible. The biggest change I made in the film was portraying Haber as unwilling to go to the front to supervise the gas attack. In reality he was very involved in operations at the front—he felt a duty and an obligation to be there—and in the feature that will be how it's portrayed. In

the short I had to crystallize his dilemma in a short time frame, and the most effective way was to have him protest. Everyone has to make up his or her own mind as to whether that's appropriate or not, but I had to be able to dramatize his dilemma and reservations.

How has *Haber* been used?

After the film appeared in festivals, I started getting e-mails from high school and college teachers in the United States, Australia, Germany, Switzerland, and the Netherlands about using the film in an educational setting. I realized this would be a great educational tool to provoke discussion among students. By selling the DVD to teachers and educators we're also demonstrating that there is a market for this subject matter. We can then turn to the film industry and say, "We've shown there is a market for this film; now help us make a feature version."

For more information on the film, visit <http://www.haberfilm.com>

This article was first published in the Spring 2010 issue of Chemical Heritage magazine.

Honoring Scientists

By Maurice Glicksman

Professor Emeritus, Brown University

As a physicist interested in the history of science, I have developed a collection of postage stamps issued by various countries to honor scientists. Nations usually honor their own scientists, but there are many that issue stamps honoring scientists from other nations. Sometimes these stamps are dignified portraits of the scientists; sometimes they are not. Examples of both, honoring Albert Einstein, are shown in Figure 1.

The United States portrayed a scientist (Benjamin Franklin) on its very first stamp, issued in 1847; a later Franklin stamp, issued in 1870, is shown in Figure 1. His stint as the first American postmaster-general was the reason for his appearance on those stamps. The first American stamp to commemorate a scientist or scientific work is the stamp shown in Figure 1, honoring the inventor engineer Robert Fulton. In 1940 the United States issued seven sets of five stamps each, honoring authors, poets, educators, scientists (Audubon, Long, Burbank, Reed and Addams), composers, artists and inventors (Whitney, Morse, McCormick, Howe and Bell). The Audubon and Bell stamps are shown in Figure 2.

Although the United States can claim 297 of the 596 winners of the Nobel Prizes in Chemistry, Economics, Physics or Physiology and Medicine, only seven (2.4%) of those have been honored on American postage stamps (three non-American Nobelists were also so honored), while 136 American Nobelists have stamps honoring them, issued by many countries. Of the eighteen science Nobel prize winners who were Americans and received their prizes 1907-1939, all of whom were deceased by 1991, only three have been shown on United States Stamps: Einstein, Millikan and Fermi.

Other countries appear to issue stamps commemorating people and accomplishments in the

sciences more frequently than the United States. France issued its first stamp honoring a scientist, Louis Pasteur, in 1923, and it is shown in Figure 2. France has had 33 French Nobel-prize winners in the sciences and 21 have been honored on stamps. Twelve (36%) appeared on French stamps. Great Britain issued its first stamp honoring a scientist, Joseph Lister, in 1965, and it is shown in Figure 2. Britain has had 82 British Nobel-prize winners in the sciences, and 51 have been honored on stamps. Ten (12%) appeared on British stamps. Germany issued its first stamp honoring a scientist, Gottfried Leibniz, in 1926 and it is shown in Figure 2. Germany has had 78 German Nobel-prize winners in the sciences, and 64 have been honored on stamps. Eighteen (23%) appeared on German stamps.

Three individuals received two Nobel science prizes: Marie Curie (who has appeared on 23 French and French colonial stamps, as well as 14 Polish stamps), Frederick Sanger (who is 91 and has not yet been honored by a British stamp) and John Bardeen (who died in 1991 and was honored by an American stamp in 2008, shown in Figure 2).

Nobel prizes are not the only mark of the importance of the work of a scientist to society. But the comparison through the postage-stamp-honoring way may indicate the attention a country devotes to its scientists and their contributions. The United States post office continues to feature media personalities and pay little attention to science, and I am certain these subjects are chosen to reflect the interests of the people using the stamps. Other countries feature their political leaders, or their poets or authors or artists, but those with significant science contributions honor their scientists more than the United States does.

Examining the postage-stamp policies of a nation may give one a measure of the relative values its people – or its government – espouse and cherish.

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Fig. 1: From left to right: Albert Einstein on a United States stamp issued 24 March 1966; Albert Einstein on an Israel stamp issued 27 September 2005; Benjamin Franklin on a United States stamp issued in 1870; The work of Robert Fulton on a United States stamp issued 25 September 1909.



Fig. 2: From left to right: John Audubon on a United States stamp issued in 1940; Alexander Graham Bell on a United States stamp issued in 1940; Louis Pasteur on a France stamp issued in 1923; Joseph Lister on a Great Britain stamp issued 1 September 1965; Gottfried Leibniz on a Germany stamp issued in 1926; John Bardeen on a United States stamp issued 6 March 2008.

Searching Smartly in the HistSciTechMed Database

By Stephen Weldon, Kim Rudolph, and Sam Spence

Although most of us are now able to find our way around online resources with at least a little facility, few of us are able to do this with the precision and skill that makes us feel satisfied that we have done it well. The problem is compounded because every database and every search engine has different quirks and protocols. As the *Isis* bibliographer, I have come to realize that few people understand enough about this particular resource in its online form (the HistSciTechMed database, or HSTM) to take advantage of the many useful subject indexing features it offers.

This article by me and my two graduate assistants, Kim Rudolph and Sam Spence, will explain how to get the most out of your searches when you use the HistSciTechMed database. Most of you will be familiar with this database, as it contains the digital version of the annual *Isis Bibliography*. As you also likely know, it contains the citation data from three other bibliographies as well. What we say here will be most relevant to finding information submitted by *Isis*, but some of the suggestions will be useful for doing global searches.¹

Part I: The structure of *Isis CB* subject indexing

The citations in the *Isis Bibliography* are indexed in two ways. They are organized according to a scheme that places each work in one location according to a classification system originally developed by George Sarton and modified several times over the past one hundred years. Moreover, they are indexed with subject terms based on a thesaurus that is expanded as neces-

sary to accommodate new subject matter. Anyone doing subject-based searching in the bibliography, whether in the print or in the electronic database, will benefit from knowing the basic construction of the classification and index terms and how to use them for effective searching.

Sarton's original classification system derived from his understanding of history of science as a discipline based fundamentally on time period (which sometimes included geographical or "ethnographical" aspects as well) and scientific discipline. He characterized these two classification modes as horizontal and vertical, a horizontal view being a broad multi-disciplinary effort to understand science in a single period or culture, and a vertical view being a narrower focus on a single scientific discipline as it developed across time. This horizontal and vertical access to the historical literature remains a consistent element throughout the classification systems of the *Isis* bibliographies from Sarton's time to today. Revisions that I made in the structure of the bibliography since 2002 have rearranged significant parts of the system, but the period-plus-discipline framework remains the fundamental structural feature of the bibliography even today. (See figures 1 and 2.)

The creation of an indexing system that would supplement the classification framework was an innovation introduced by Magda Whitrow when she worked on the first cumulative bibliography spanning the period from 1913 to 1965. Her indexing system came directly from a faceted classification structure that she employed for placing citations with greater precision in this extremely large printed cumulation. By creating a much more detailed classification system, she was able to make fine distinctions in otherwise broad topical areas (so that instead of merely classifying a work as about "geology," for example, she could tag it as "mineralogy" or even "gem stones"). Whitrow advanced the system in another way as well. Not only did she increase the precision of existing horizontal and vertical classification forms, she also introduced a detailed vocabulary to describe wholly new features of the works: aspects of

¹ One word of caution before we begin: The HISTSCI-TECHMED database has data formatted and submitted by different bibliographers, which means that certain types of searches will only work with some of the data. Even the format of the *Isis* data has changed over the years. This means that you will need to employ different search tactics to find data that includes citations from both the earlier submissions and the more recent ones and for data submitted by other users. This article will focus mostly on extracting information from recent *Isis* data, from 2000 to the present. In future articles we hope to provide suggestions on integrating searches across the database.

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scientific organization, historical analysis, and bibliographical form, such as “privately sponsored,” “freedom and secrecy,” “methods of communication,” and “archives; manuscripts.”

John Neu, the University of Wisconsin librarian who edited the *Isis* CB for over thirty years, employed the Whitrow category system as the basis for his subject indexing in the HistSciTechMed database. The detailed terminology proved ideal for this, although there were some disadvantages. Developed for classification, the Whitrow system concatenated many terms that made it function less precisely for a database index. For example, when the single subject phrase “North America: United States; Canada” is used to tag citations, users have no way of separating those entries dealing with Canada, from those on North America or the United States. To solve this problem, I have continued to use Whitrow’s terminology, but have frequently broken the phrases into discrete units: “North America,” “United States,” and “Canada.” In addition, I freely add new terminology to the thesaurus as needed, and I don’t hesitate to use multiple chronological, geographical, and disciplinary terms for a single entry—something which was impossible as long as the Whitrow terminology was tied to a single-entry classification structure.

Part II: Practical search techniques in the HistSciTechMed database

The indexing system of the HistSciTechMed database makes it possible to utilize both the standard annual classification scheme as well as the index terms in the thesaurus for discovery. All of the items published since 2000 now have subject terms from both the annual print-volume classification and Whitrow-based thesaurus index terms. (See figure 3.) This gives researchers a good bit of flexibility in subject searching, allowing both narrowly focused subject searches as well as broad category listings. By combining the two in ingenious ways, researchers can perform a variety of specialized searches.

The advantage of utilizing both of these features, the classification system and the thesaurus, is that scholars can find their way into the literature using search strategies that are designed to accommodate

more types of research projects. The data continues to provide access according to horizontal and vertical categories of chronology and discipline, but many other kinds of searches are possible. By analogy one can think of these other ways of searching through the data as diagonal methods. The topic area of science and religion, for example, spans many disciplines and time periods, cutting through those two fundamental structures. The citations in the database added after 2002 are indexed with such diagonal strategies in mind.

Understanding the OCLC terminology

To understand the indexes in HistSciTechMed, let’s first examine a typical record. Looking at figure 4, you can see how records utilize the subject tagging that we’ve been talking about. You’ll notice that there are several types of subjects listed in this record, most of which can be searched separately (time, the main exception, cannot). OCLC has seven types of indexes accessible. They are subject, identifier, descriptor, geographic name, named corporation, named person, and time. (See figure 5.)

Of these indexes, we will focus on three: subject, identifier, and descriptor. The subject index is the meta-index, and it includes all of the other fields within it. You will want to use this field for general searching, when you do not need or desire to differentiate types of terms.

The identifier index is the one *Isis* data uses for the print classification structure. The identifiers include only *Isis* CB classification terms and none of the other thesaurus index terms. This means that the HistSciTechMed identifiers correlate closely, though not exactly, to the classification headings in most of the print bibliographies. The current classification system is shown in figure 2; this list differs slightly from those found on back covers of recent bibliographies.

The descriptor index is the one in which incorporates the *Isis* subject thesaurus terms. By selecting either identifier or descriptor, you can perform the more advanced searching described here. The important distinction to remember is the one between the descriptor and the identifier fields.

Replicating the annual printed CB categories in the online database

Depending upon your research project, you may find it helpful to replicate the print categories of the CB. Let's say your area of interest is early modern chemistry and you find the "Chemistry—17th Century" section of the printed bibliography to be the most helpful to you. You can recreate this category through a search using the identifier field.

To perform a search of this sort, you must go to the advanced search window and enter terms as found on the list in figure 2. In our example, we enter "17th century" in the first box, and then "chemistry" in the second box. The dropdown box next to these terms should be marked as identifier. (See figure 6.) Perform the search, and you will find all *Isis* results for "Chemistry—17th Century."

Replicating the category search has advantages and disadvantages. A second example will show you some of the limitations of this kind of search. Let's say you are interested in East Asian medicine. In order to replicate this *Isis* category exactly, first find the exact category terms: "Asian cultures—Medical sciences, general works." Following the procedure laid out above, you would enter "Asian cultures" into the first box and "medical sciences, general works" into the second box, selecting identifier for both. Upon performing the search, you will find all *Isis* bibliography results for this category. In this case, however, it is a disappointingly small search result.

The main advantage to this form of searching is its familiarity to print users who find the print classification valuable for discovery in their particular field. The disadvantages are that searches of this kind currently omit records classified prior to 2000 (this ought to change soon however), and that these general category searches tend to be imprecise.

Using the subject index to do more refined searching

An alternative means of searching by index terms will produce more specific results. Using the subject and descriptor indexes allows both greater precision when doing standard horizontal (time-bounded) and

vertical (discipline-bounded) searches and makes various kinds of diagonal searching possible. Searching by subject is a far better and more customizable tool. Below, we will illustrate how you can use and customize subject searches to find results that you may not have found otherwise.

Effective subject and descriptor searching is somewhat more complicated than identifier searching because finding the correct search terms and learning how to combine them appropriately takes more work than identifier searching. There are three main ways to locate search terms: scanning the index of the print bibliography, exploratory searching, and using the Related Subjects button.

(1) Scanning the index of the print bibliography is still a good place to start if there are any index terms you find yourself using often. The *Isis CB* Web site also has a list of the subject terms which can be downloaded. (<http://www.ou.edu/cas/hsci/isis/website/thesaurus/index.html>). By looking at this list carefully one can discover the precise terminology that is used for classification. Sometimes there are patterns that might be helpful in searching. The thesaurus contains a number of parallel terms, for instance, that reflect similar topic areas in different disciplines. The term "science and war," parallels both "technology and war," and "medicine and war." Understanding the nature of this thesaurus, thus, can dramatically help with either more precise or more comprehensive discovery.

(2) An exploratory search using keywords is another method of finding relevant search terms. Here is an example where the most relevant subject terms may not be the ones that immediately come to mind. The first step in an exploratory search is doing a keyword search using the terms you think most appropriate. Let's assume that you are interested in finding material on science in Russia during the Cold War. If we limit our search only to *Isis* records after 2000, a quick keyword search of cold war and Russia yields only nine records. (See figure 7.) Judging by the number of results, you can immediately tell that this search is not getting all of the records that you want. It turns out that the term Cold War is not a commonly used index term. The most commonly shared terms are "20th century,"

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“20th century, late,” “Russia,” and “Soviet Union.”² (See figure 8.)

(3) Using the Related Subjects button is a third very useful method for identifying related terms. This button is on the top right hand side of the search results screen. (See figure 7.) When you are looking at your search result, this button will take you to a list with all of the index terms of all of the records in the found set, ranked according to the percentage of records in your found set tagged with that term. (See figure 9.) Using this screen may help you identify terms you did not expect to be associated with your search. (Discovering subjects through exploratory searches and the Related Subjects button will work with all four databases included in HistSciTechMed.)

After identifying the most relevant search terms, the actual search process is relatively simple, the choice you have will be determining whether to search by subject or by descriptor. The broadest type of search and probably the one you’ll want to do most often is a subject search because it includes all of the subject indexes. To do this, make sure the drop down box next the each search field is set to subject³ (see figure 10) and use the Boolean operators as desired. (OCLC has a guide to Boolean operators in its help section.) If you want to search a particular phrase such as “science and war” you should put quotation marks around the phrase; otherwise the search will return all terms that have

2 Notice that the terms “Russia” and “Soviet Union” appear both together and separately. Because of this, we want to find records that include either “Russia” or “Soviet Union” or both. The Boolean search operator “OR” performs this function. A subject search of “Russia” OR “Soviet Union” will return all the records that have at least one of those identifiers. This search returned 312 results – a much larger number than our previous result of 8. Remember, though, that we are interested particularly in Cold War science in Russia, so we need to limit our results to that time period. For this example, let’s use “20th century, late” to find material on Russian science after WWII. If you look to the left side of the search boxes on the advanced search screen, you will see a drop down box with the options “and,” “or,” and “not.” Using these boxes we can refine the parameters of our search. We have already determined that we want to use “Russia” OR “Soviet Union”; now, to limit our search we should add AND “20th century, late”.

3 Note that you should not use “subject phrase.”

both science and war anywhere in one of the descriptor fields, not just those items listed as “science and war.” In Figure 11 we have used “20th century, late” and “Soviet or Russia” in the second box, both searched as subjects. This now produces a much longer list of terms that deal with Cold War Russian science. (See figure 11.)

Although using the subject index is easy, there may be times in which using the specific indexes such as descriptor, geographic name phrase, or the like will be advantageous. Let us assume that you want to find sources that deal with science and literature. The print category “Science and literature; science and art” includes literature, but neither a subject search nor an identifier search will work well for this search, because both will result in far too many unwanted records. In this case, using the descriptor field will allow you to focus on “science and literature” alone. (See figure 12.)

The most complex type of search you can do will allow you to combine searches within the classification categories and thesaurus terms. By using the identifier index to do a category-based search for the time period we can isolate items with a primary focus on a time period. Let’s take the example of medieval traditional medicine. If we run an identifier search using “medieval” and a descriptor (or subject) search for “medicine, traditional,” we will find about 4 records. (See figure 13.) So, too, for a search of works specifically on eugenics in the 19th century. Using the index term “eugenics” and the classification category of “19th century” we can use the descriptor and identifier fields, respectively, to yield results that focus on this period. (See figure 14.)

A subject search of the period in each case would have returned more results, but these would have included works with a much broader chronological range. In the eugenics example, we wanted to exclude the mass of records dealing with 20th-century eugenics. This sort of combination is just not possible in the print version.

Figure 1. Classification structure of the *Isis Current Bibliography*. The current classification structure is related to George Sarton’s period-plus-discipline framework, which he spoke of on occasion in terms of the vertical and horizontal

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study of history. The bibliography indexes work in multiple categories and pay special attention to topical areas in the first four general categories—such as “science and literature” or “scientific institutions.” By doing this, it supplements vertical and horizontal classification with “diagonal” categories that cut through both time and discipline.

| | |
|--|--|
| A. Tools for Historians of Science | General categories (the basis for “diagonal” searching) |
| B. Theoretical Approaches to Understanding Science | |
| C. Thematic Approaches to the Study of Science | |
| D. Aspects of Scientific Practice and Organization | |
| E. Disciplinary Classification | “Vertical” classification |
| F. Classification by Cultural Influence | “Horizontal” classification |
| G. Chronological Classification | |

Figure 2. Full classification structure of the *Isis Current Bibliography* as of August 2009. In order to make the previous classification system used by John Neu work more closely with the one that I have used, I have recently made some terminological changes in the classification structure. These are printed in the most recent *Isis CB* (volume 100). Below is the complete classification system as it is now set up and in use in the HistSciTechMed database.

A. Tools for Historians of Science

1. History of science, general works; 2. National contexts; 3. Reference works and repositories; 5. Historiography and historical methods; 6. History of science as a profession; 7. Historians of science

B. Theoretical Approaches to Understanding Science

10. Philosophy and methods of science; 11. Sociological or psychological analysis of science; 12. Rhetorical or representational analysis of science

C. Thematic Approaches to the Study of Science

20. Science and society, general works; 21. Science and ethics; 22. Science and society (esp. politics, law, and economics); 23. Science and culture (esp. literature and the arts); 26. Science and race; science and ethnicity; 27. Science and gender; 28. Science and religion; 29. Science and war

D. Aspects of Scientific Practice and Organization

40. Scientific institutions; 41. Scientific instruments; 42. Scientific education; educational institutions; 43. Professional activities of scientists

E. Disciplinary Classification

101. Occultism and natural magic; 102. History of philosophy; 103. Mathematics; 104. Music
 110. Astronomy and cosmology; 111. Astrology; 112. Physics; physical sciences, general works; 113. Chemistry; 114. Alchemy
 120. Earth and atmospheric sciences; 121. Geography; cartography; exploration; 122. Natural history; 123. Environmental sciences; 124. Paleontology
 130. Biological sciences, general works; 131. Botany; 132. Zoology; anatomy and physiology; 133. Heredity; evolution; genetics; 134. Microbiology; molecular biology; 135. Physical anthropology; human anatomy and physiology; 136. Neurosciences; 137. Psychology; comparative psychology
 140. Social sciences; 141. Sociology; 142. Cultural anthropology; 143. Economics; 144. Linguistics; 145. Archaeology; 146. History as a discipline
 150. Medicine, general works; 151. Psychiatry; medical psychology; 152. Public health; 153. Pharmacy

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160. Technology, general works; 161. Communication and computer technology; 163. Agriculture; 164. Air and space technology

F. Classification by Cultural Influence

200. Cross-cultural contexts, general works; 210. Arabic-Islamic cultures; 220. Medieval Byzantium; 230. Asian cultures; 240. Indian cultures; 250. Jewish culture; 260. Native American cultures; 270. Traditional cultures

G. Chronological Classification

300. Prehistory; 311. Ancient Near East; 312. Ancient Greece and Rome; 320. Medieval; 330. Renaissance; 340. 17th century; 350. 18th century; 360. 19th century; 370. 20th century; 375. 20th century, late

Figure 3. The two types of subject tagging in the *Isis* bibliography: (1) classification, based on the broad fields established initially by Sarton for his semi-annual print bibliographies, and (2) subject index tags, providing more precise classification, based initially on Magda Whitrow's classification system and now regularly expanded.

| Examples of classification categories | Examples of subject index terms |
|---|---------------------------------|
| Science and war | Biological warfare |
| Geography; cartography; exploration | Maps, atlases |
| Botany—Asian cultures | China |
| Alchemy—Medieval | Hermeticism |
| Science and society, general works—20th century | Popularization |

Figure 4. Example of a record in HistSciTechMed showing the different subject types.

| |
|--|
| Title: Eclipse records in historical documents of the Qing Dynasty and current research on them |
| Source: <i>Guangxi Minzu Xueyuan Xuebao</i> 12, 1 (2006), 32–36 |
| Language: Chinese |
| SUBJECT(S) |
| Descriptor: Astronomy Eclipses; transits; occultations |
| Geographic: East Asia, civilization and culture China |
| Time: Qing dynasty (China, 1644-1912) |
| Identifier: Astronomy and cosmology -- Asian cultures |
| Note(s): [Translated title.] In Chinese. |
| Document Type: Journal Article |
| Accession No: XISI701130-H |
| Database: HistSciTechMed |

Figure 5. Subject types in HistSciTechMed and their *Isis* equivalent.

The HistSciTechMed database draws on additional academic providers of bibliographic data beyond the *Isis* bibliography. Their methods of classification do not conform to this list; it is for *Isis* data only.

| Subject type in HistSciTechMed | Equivalent Isis subject type (post-2000) |
|--------------------------------|--|
| <i>subject</i> | all tags (thesaurus terms and classification categories) |
| <i>identifier</i> | classification category (see figure 2) |

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| | |
|--------------------------|--|
| <i>descriptor</i> | thesaurus term representing a subject, but <i>not</i> a proper name (place, institution, or person) or a time period |
| <i>geographic name</i> | thesaurus place name |
| <i>named corporation</i> | thesaurus institution name |
| <i>named person</i> | thesaurus personal name |
| <i>time</i> | thesaurus chronological period |

Figure 6. Dropdown list for field type in the HistSciTechMed database.

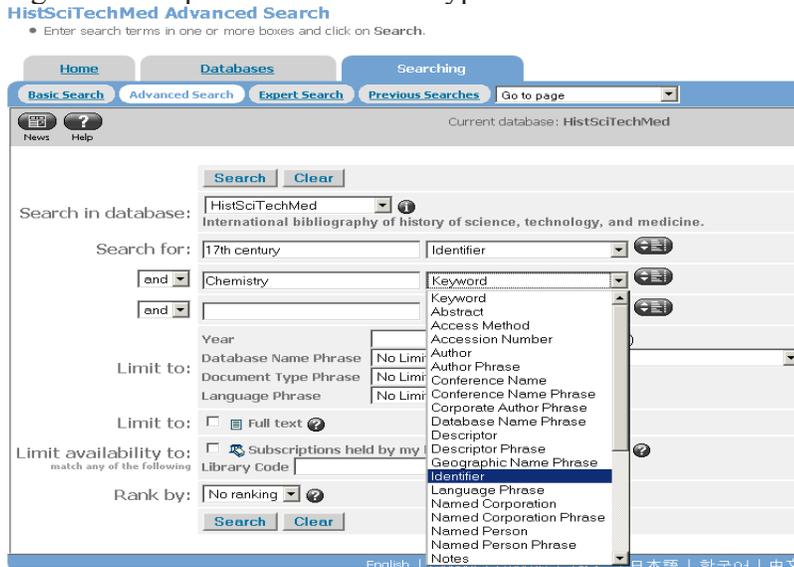
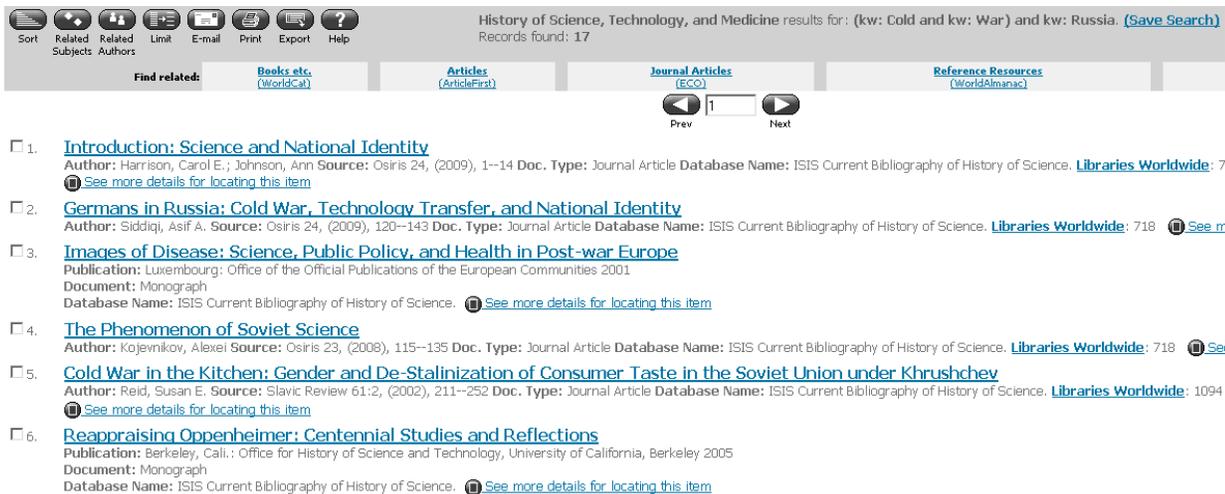


Figure 7. Search results of a keyword search of “Cold War” and “Russia.”



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Figure 8. Detailed view of the fourth record in the search results displayed in figure 7.

The Phenomenon of Soviet Science

Alexei **Kojevnikov**

2008
English Journal Article
Osiris, 23, (2008), 115--135

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Database Name: ISIS Current Bibliography of History of Science.

Author(s): [Kojevnikov, Alexei](#)

Title: **The Phenomenon of Soviet Science**

Source: *Osiris* 23, (2008), 115--135

Standard No: **ISSN:** 0369-7827

Language: English

SUBJECT(S)

Descriptor: [National histories](#)
[Science, general histories](#)

Geographic: [Russia](#)
[Soviet Union](#)

Time: [20th century, late](#)

Identifier: National contexts -- 20th century, late

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Figure 9. The Related Subjects button, which is found on the upper left side of the search results screen. (See figure 7.)

| | |
|--|-----|
| <input type="checkbox"/> Russia | 52% |
| <input type="checkbox"/> Soviet Union | 35% |
| <input type="checkbox"/> Science and politics | 29% |
| <input type="checkbox"/> Cold War | 23% |
| <input type="checkbox"/> National histories | 23% |
| <input type="checkbox"/> United States | 17% |
| <input type="checkbox"/> National identity | 17% |
| <input type="checkbox"/> 20th century | 17% |
| <input type="checkbox"/> Cross-national comparision | 17% |
| <input type="checkbox"/> 20th century, late | 17% |
| <input type="checkbox"/> Science and society (esp. politics, law, and economics) -- 20th century | 11% |
| <input type="checkbox"/> War | 11% |
| <input type="checkbox"/> Germany | 11% |
| <input type="checkbox"/> Military technology | 11% |
| <input type="checkbox"/> Surgery | 11% |
| <input type="checkbox"/> France. | 11% |
| <input type="checkbox"/> Science and society | 11% |

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Figure 10. The advanced search screen showing the complete list of indexes from the dropdown box.

The screenshot shows the 'Advanced Search' page of a database. At the top, there are navigation tabs: Home, Databases, Searching (selected), and Results. Below these are sub-tabs: Basic Search, Advanced Search (selected), Expert Search, and Previous Searches. A 'Go to page' dropdown is also present. On the left, there are icons for News and Help. The main search area includes a 'Search in database:' dropdown set to 'HistSciTechMed', a 'Search for:' field with '20th century, late', and two 'and' dropdowns for combining terms, with 'Soviet OR Russia' in the second. There are 'Search' and 'Clear' buttons. Below this are 'Limit to:' sections for 'Year' (2000-20...), 'Database Name Phrase' (Isis Curr...), 'Document Type Phrase' (No Limit), and 'Language Phrase' (No Limit). Another 'Limit to:' section has checkboxes for 'Full text' and 'Subscriptions held by my li...'. A 'Limit availability to:' section has a checkbox for 'Subscriptions held by my li...' and a 'Library Code' field. A 'Rank by:' section has a dropdown set to 'No ranking'. A large dropdown menu is open on the right, listing various search indexes: Keyword (checked), Abstract, Access Method, Accession Number, Author, Author Phrase, Conference Name, Conference Name Phrase, Corporate Author Phrase, Database Name Phrase, Descriptor, Descriptor Phrase, Geographic Name Phrase, Identifier, Language Phrase, Named Corporation, Named Corporation Phrase, Named Person, Named Person Phrase, Notes, Personal Name, Personal Name Phrase, Publication Date, Series Title, Series Title Phrase, Source, Source Phrase, Standard Number, Subject (highlighted), Subject Phrase, Table of Contents, Title, and Title Phrase. At the bottom right, there is a page number '35' and the text 'History of Science Society Newsletter • April 2010'.

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Figure 11. Search results for a subject search of “20th century, late” and “Soviet OR Russia”

History of Science, Technology, and Medicine results for: (su: Soviet OR su: russia) and ((su: 20th and su: century, an
Records found: 88

Find related: [Books etc. \(WorldCat\)](#) | [Journal Articles \(ECO\)](#) | [Reference Resources \(WorldAlmanac\)](#)

1. [Soviet/Russian-American Space Cooperation](#)
Author: Karash, Yuri Y. Source: Dissertation Abstracts International. A 70/03, (2009) Doc. Type: Journal Article Database Name: ISIS Current Bibliography of History of Science. [Libraries!](#)
[UNIV OF OKLAHOMA](#) [See more details for locating this item](#)

2. [On the Side: Car Culture in the USSR, 1960s--1980s](#)
Author: Siegelbaum, Lewis H. Source: Technology and Culture 50, (2009), 1--22 Doc. Type: Journal Article Database Name: ISIS Current Bibliography of History of Science. [Libraries!](#)
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3. [The Development of Photodiodes and Lasers: The Contribution of Russian Scientists](#)
Author: Nosov, Yu. R. Source: Voprosy istorii estestvoznaniia i tekhniki 6, 2 (2006), 49--61 Doc. Type: Journal Article Database Name: ISIS Current Bibliography of History of Science. [Libraries!](#)
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4. [Academician Pavel Alekseevich Cherenkov and the Collaboration between FIAN \(the Physical Insitute of the Academy of Sciences\) Laboratory for High-Energy Physics](#)
Author: Baranov, P. S.; Lebedev, A. I.; Cherenkova, E. P. Source: Voprosy istorii estestvoznaniia i tekhniki 8, 2 (2008), 140--153 Doc. Type: Journal Article Database Name: ISIS Current Bibliography of History of Science. [Libraries! Worldwide: 58](#) [See more details for locating this item](#)

5. [In the Shadow of the Moon: A Challenging Journey to Tranquility, 1965--1969](#)
Author: French, Francis; Burgess, Colin
Publication: Lincoln: University of Nebraska Press 2007
Document: Monograph
Database Name: ISIS Current Bibliography of History of Science. [See more details for locating this item](#)

6. [The Red Stuff: A History of the Public and Material Culture of Early Human Spaceflight in the U.S.S.R.](#)
Author: Lewis, Cathleen Susan Source: Dissertation Abstracts International. A 69/02, (2008) Doc. Type: Journal Article Database Name: ISIS Current Bibliography of History of Science.
[UNIV OF OKLAHOMA](#) [See more details for locating this item](#)

Figure 12. Using the dropdown menu to do a *descriptor* search.

Home | Databases | Searching | Results

Basic Search | Advanced Search | Expert Search | Previous Searches | Go to page

News | Help

Search in database: **HistSciTechMed** International bibliography of h

Search for: Science and Literature

Limit to: Database Name Phrase (Isis Curr), Document Type Phrase (No Limit), Language Phrase (No Limit)

Limit to: Full text, Subscriptions held by my li

Limit availability to: match any of the following Library Code

Dropdown menu options:

- Keyword
- Abstract
- Access Method
- Accession Number
- Author
- Author Phrase
- Conference Name
- Conference Name Phrase
- Corporate Author Phrase
- Database Name Phrase
- Descriptor**
- Descriptor Phrase
- Geographic Name Phrase
- Identifier
- Language Phrase
- Named Corporation
- Named Corporation Phrase
- Named Person
- Named Person Phrase
- Notes
- Personal Name
- Personal Name Phrase
- Publication Date
- Series Title
- Series Title Phrase
- Source
- Source Phrase

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Figure 13. The search results after doing a combination search, seeking “medieval” in the *identifier* index and “medicine, traditional” in the *descriptor* index.

History of Science, Technology, and Medicine results for: id: Medieval and
Records found: 6

Sort Related Subjects Related Authors Limit E-mail Print Export Help

Prev 1 Next

1. [Medieval Herbal Remedies: The Old English Herbarium and Anglo-Saxon Medicine](#)
Author: Van Arsdall, Anne
Publication: New York: Routledge 2002
Document: Monograph
Database Name: ISIS Current Bibliography of History of Science. [See more details for locating this item](#)
2. [La prevención de la enfermedad en la España bajo medieval](#)
Author: Peña, Carmen; Girón Irueste, Fernando
Publication: Granada: Editorial Universidad de Granada 2006
Document: Monograph
Database Name: ISIS Current Bibliography of History of Science. [See more details for locating this item](#)
3. [The "Old English Herbarium" in a New Context](#)
Author: Van Arsdall, Anne Source: Dissertation Abstracts International. A 62, (2002), 2756 Doc. Type: Journal Article Database Name: ISIS UNIV OF OKLAHOMA [See more details for locating this item](#)
4. [Words, Stones, and Herbs: The Healing Word in Medieval and Early Modern England](#)
Author: Bishop, Louise M.
Publication: Syracuse, N.Y.: Syracuse University Press 2007
Document: Monograph
Database Name: ISIS Current Bibliography of History of Science. [See more details for locating this item](#)

Figure 14. A similar search result as in figure 13, seeking “eugenics” in the *descriptor* index and “19th century” in the *identifier* index.

Home Databases Searching Results

List of Records Detailed Record Marked Records Saved Records Go to page

History of Science, Technology, and Medicine results for: (id: 19th and id: century)
History of Science". [\(Save Search\)](#)
Records found: 24

Sort Related Subjects Related Authors Limit E-mail Print Export Help

Prev 1 Next

1. [Kolonialismus, Eugenik und Bürgerliche Gesellschaft in Deutschland 1850-1918 /](#)
Author: Grosse, Pascal.
Publication: New York: Campus, 2000.
Document: Monograph
Database Name: Isis Current Bibliography of History of Science. [See more details for locating this item](#)
2. [Eugenics and Freedom at the Fin de Siècle /](#)
Author: Richardson, Angélique. In: Culture and Science in the Nineteenth-Century Media; p.275-286; Aldershot, U.K.; Burlington, VT: Ashgate
Bibliography of History of Science. [See more details for locating this item](#)
3. [Love and Eugenics in the Late Nineteenth Century: Rational Reproduction and the New Woman /](#)
Author: Richardson, Angélique.
Publication: Oxford and New York: Oxford University Press, 2003.
Document: Monograph
Database Name: Isis Current Bibliography of History of Science. [See more details for locating this item](#)
4. [Aspects et développements récents de l'histoire de l'eugénisme /](#)
Author: Jeanmonod, Gilles. Source: Gesnerus Vol. 60 (2003), p. 83-100 Doc. Type: Journal article Database Name: Isis Current Bibliography of History of Science. UNIV OF OKLAHOMA [See more details for locating this item](#)

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Figure 15. Choices available when using the Limit button, which can be found on the upper left hand side of the search results screen. (See figure 7, 13, or 14.)

Limit Results

- Select a term from one of the following categories to limit your search.
- Click on the + sign to display the available terms.

The screenshot shows a search results interface. At the top, there are four main navigation tabs: Home, Databases, Searching, and Results. Below these are five sub-tabs: List of Records, Detailed Record, Marked Records, Saved Records, and Go to page. The main content area displays the search results for 'History of Science, Technology, and Medicine' with 24 records found. A 'Limit Your Results' section is visible, featuring a checkbox for 'Subscriptions held by your library (OKU, UNIV OF OKLAHOMA)' and five expandable options, each marked with a plus sign (+):

- [Limit Your Results by Author](#)
- [Limit Your Results by Subject Headings](#)
- [Limit Your Results by Year](#)
- [Limit Your Results by Document Type Phrase](#)
- [Limit Your Results by Language Phrase](#)

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Figure 16. Screen showing how to limit by year.

The screenshot shows a search results interface with a navigation bar at the top containing 'Home', 'Databases', 'Searching', and 'Results'. Below this is a secondary bar with 'List of Records', 'Detailed Record', 'Marked Records', 'Saved Records', and 'Go to page'. The main content area displays the search title 'History of Science, Technology, and Medicine' with 'Records found: 24'. A list of filters is shown, including 'Subscriptions held by your library', 'Author', 'Subject Headings', and 'Year'. The 'Year' filter is expanded to show a 'Date range' input field and a list of years with their respective record counts: 2006 (1), 2004 (4), 2003 (6), 2002 (2), 2001 (3), 2000 (3), and 1998 (1). 'Search' and 'Clear' buttons are located below the year list. Further filters for 'Document Type Phrase' and 'Language Phrase' are visible at the bottom.

Home **Databases** **Searching** **Results**

List of Records **Detailed Record** **Marked Records** **Saved Records** **Go to page**

? **History of Science, Technology, and Medicine** results for: (id: 19th and
Help Records found: **24**

Limit Your Results by Subscriptions held by your library (OKU, UNIV OF OKLAHOMA)

+ Limit Your Results by Author

+ Limit Your Results by Subject Headings

- Select a Year to Limit Your Results

Date range: YYYY-YYYY

[2006](#) 1

[2004](#) 4

[2003](#) 6

[2002](#) 2

[2001](#) 3

[2000](#) 3

[1998](#) 1

+ Limit Your Results by Document Type Phrase

+ Limit Your Results by Language Phrase

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Figure 17. The Basic Search screen.

The screenshot shows the 'Basic Search' interface for the HistSciTechMed database. At the top, there are navigation tabs: Home, Databases, Searching (selected), and Results. Below these are search options: Basic Search (selected), Advanced Search, Expert Search, and Previous Searches. A 'Go to page' dropdown menu is also present. On the left, there are icons for Intro, News, and Help. The current database is identified as HistSciTechMed. The search form includes a 'Search' and 'Clear' button at the top. Below this is a dropdown menu for the database, currently set to HistSciTechMed, with an information icon. The database description is 'International bibliography of history of science, technology, and medicine.' There are three search fields: 'Keyword', 'Author', and 'Title', each with a question mark icon. Below these is a 'Limit to:' section with a radio button for 'Full text' and a question mark icon. At the bottom of the form are 'Search' and 'Clear' buttons.

Useful Hints and Tips for Working with your Search Results

The Limit button, which can be found in the top row of buttons on the results screen (see figure 7 or figure 11) may provide some useful refining tools for your searches. (See figure 15.)

- Limiting by Year. For example, if you wish to set a date range on your results, select Limit and then “Limit by Year.” (Figure 16.) This function will allow you to enter a date range and also presents a useful list that relates the year published to the frequency of your results. By using this function you can see trends on the rate of publishing on your subject.

- Limiting by Document Type Phrase will limit your results to the medium of your choosing: Journal article, Book review, Chapter, Monograph, Serial.

- Limiting by Author will show the frequency of authors who have written about this subject – this is a useful tool to find authors who are publishing about your area of interest, and in what frequency.

- Limiting by Subject Heading is especially useful. By clicking this option, you will see a list of subjects that occur frequently with the subject you searched.

You can search these related terms by selecting them and clicking Search at the top, and it will search for the additional terms plus the original term using the AND operator. Note that this function can also be reached by clicking Related Terms on the results page.

All of these Limit functions can be used simultaneously to produce a very specific, very refined result. Note that many of these functions can be set before a search is done using the Advanced Search feature. However, you may find you prefer working with the results rather than setting limits on the search before you obtain results. (Subject Heading and Author feature are not available before your search.)

One word of caution regarding author and title searches. If you are doing a simple author or title search, it is best to use the Basic Search screen, (see figure 17) which is relatively self explanatory; however, there are a few points to note. Of the three search fields (keyword, title, and author), do not use keyword if you are searching for a specific author. Neither order of names nor punctuation matters in basic searches; all of these searches find all words irrespective of their location in a field.