

Ars Hermeneutica, Limited
6505 Alexis Drive
Bowie, MD 20720-4760
25 August 2006Internal Revenue Service
4921-CHI, 17th Floor, Rm 1720
230 S. Dearborn Street
Chicago, IL 60604

Attention: M. Ranney

Re: Questions concerning Form 1023, in letter dated 4 August 2006, for:
Ars Hermeneutica, Limited
EIN: 20-2143388

Dear Mr. Ranney,

I am sending the enclosed pages in response to your questions concerning Ars Hermeneutica's *Application for Recognition of Tax-Exempt Status, Form 1023*.

Following the pages with the questions and interspersed answers, you will find two appendices with a few pages of supporting material. These are referred to in some of the answers and provide additional information about our activities during the past year.

Thank you for taking the time to phone earlier this week and clarifying some points for me. Naturally, if more questions arise as we continue with this process, I am at your service.

Sincerely,

Jeffrey N. Shaumeyer
President, Ars Hermeneutica, Limited

Question 1. Please provide some more specific examples concerning the type of research that your organization plans to undertake.

In the past year it has become clear that directing our research efforts at technology assessment¹ should be our immediate plan for building our research capacity and remain strategically central to our research program. "Technology Assessment" is a cross-disciplinary, systems approach to understanding the results of modern scientific research, analyzing the utility and trends of competing technologies, and evaluating their effect on society in policy- and decision- making.

A good model for our approach to technology assessment is the now-defunct congressional Office of Technology Assessment (OTA). This was an independent research organization founded by an act of Congress in 1972 to provide Congress with

...effective means for securing competent, unbiased information concerning the physical, biological, economic, social, and political effects of such applications; and [to] utilize this information, whenever appropriate, as one factor in the legislative assessment of matters pending before the Congress...."²

The OTA ceased operations in 1995. Our goal is to replace some of the technical-assessment capacity lost to the US government when the OTA closed.

Ars Hermeneutica incorporated as a nonprofit corporation to support our organizing mission of "providing independent, objective, authoritative, and accurate analysis, assessment, advice, guidance, and leadership on scientific and technical matters."

Technology assessments of the type we contemplate integrate scholarly endeavors that evaluate published information with data collected by our own research to make unbiased and objective recommendations on technical and scientific questions. Our goal is to help those who must

¹ Described in general terms under the section heading "2.1 Scientific & Technical Navigation" in our original answer to Form 1023's Section IV: Narrative Description of Company Activities

² From the original "Office of Technology Assessment Act", Public Law 92-484, dated 13 October 1972; the text is available at the "OTA Legacy" website: http://www.wws.princeton.edu/ota/ns20/act_f.html

make policy or business decisions in a bewildering scientific and technical landscape. In passing we note that the Rand Corporation, the MITRE Corporation, and SRI International are tax-exempt organizations that provide technology assessment.

We expect our technology assessments will be funded by government agencies and the US Congress. Because of the broad systems approach to making technology assessments, it's difficult to guess specific questions that we might research at the behest of government agencies.

Some topics that align with our current interests that we might imagine as the basis for studies:

- ♦ Scientific literacy among school-aged children
- ♦ The commercial readiness of competing alternative energy sources
- ♦ Technical competitiveness of US industries in international markets
- ♦ Accuracy in reporting science news in major media
- ♦ Assessments of technologies used for science education
- ♦ The effectiveness of testing in promoting learning
- ♦ Electronic conferencing and intra-group communication

Question 2: Explain how and by whom research projects are determined and selected.

Research projects are determined and selected by the research staff of Ars Hermeneutica. Our professional staff initiate research projects on specific topics, typically in response to solicitations or research opportunities announced by agencies of the federal government.

While our company is small, all staff are involved in identifying, discussing, and selecting specific research opportunities to pursue. Once opportunities are identified, a lead researcher assembles their proposed research team from the staff and prepares a proposal for research in response to the announced opportunity. The President provides day-to-day guidance on research goals and their relation to the corporate mission; the Board of Directors provides broad direction on research programs.

Question 3: Who will perform the research?

The research will be performed by the full-time professional staff of Ars Hermeneutica. Occasional consultants with specific expertise may be required by some research projects.

Question 4: Please provide copies of any research contracts that you have entered into.

We have entered into no research contracts to date.

Question 5: Where is it expected that the research will be performed?

We expect the research to be performed predominantly in our own facilities. For the first few years our technology assessments and systems research will largely involve scholarly research and office facilities will be adequate. Assessments and conceptual studies may require gathering research data on site.

For instance, we are planning to partner with a commercial enterprise to develop concepts for video games that would be based on scientific and mathematical principles, as casual science education tools aimed at school-aged children. In this partnership Ars Hermeneutica would perform the research leading to scientifically accurate computer-game concepts; our commercial partner would then implement the games and market the products. This research would likely involve gathering data from experimental classroom trials.

With the same partner we are also developing plans to perform computer-science research on computer algorithms as an enabling technology for high-fidelity virtual reality "games" that could be used as training simulators by the Department of Defense. This development would likely require gathering some on-site data to perfect the fidelity of the algorithms.

Other collaborative research may use specialized facilities with our research partners. As an example, we have had preliminary discussions with a colleague at a major research university about teaming for a joint research project considering the effect of computer-network teleconferencing technologies on group dynamics in decision making. Some of the empirical research for this project would best be performed in the existing, specialized research facilities of our academic partner.

Question 6: Furnish copies of any publications showing reports of your research activities.

We have published no reports to date. We have in progress one report assessing the current technology and availability of satellite communications for use in deep-sea oceanographic research.

Question 7: Please provide more detail regarding your concerns about public inspection of your intended activities. How could public inspection of

the information submitted with your application have an adverse effect on your operations?

We agree that this material is now unlikely to have a serious adverse effect on our operations. Therefore, we no longer wish to claim "Not Subject to Public Inspection" for pages 7—11 of our original answer to "Form 1023, Part IV: Narrative Description of Company Activities".

Question 8: With regard to question #7: Normally, the information that is required to be submitted with an application for tax-exempt status is open to the public, which would include both the financial data, and the planned research data that you wish to remain secret. At this point, it is not clear that we are permitted to limit public inspection of the financial information, as well as other information that is required to be submitted with your application. Further, it is not clear how the revelation of your financial information, and research plans can adversely affect your operations.

We agree that this material is not sensitive business information and should be available for public inspection. Therefore, we no longer wish to claim "Not Subject to Public Inspection" for pages 1, 2, and 3 of our answer to "Form 1023, Part IX: Financial Data".

Question 9: How does your operation differ from that of a private consulting firm?

We believe there are three fundamental ways that we differ from a private consulting firm, which derive from our organizing principles.

Nonprofit Corporation

Ars Hermeneutica organized as a nonprofit corporation (in the state of Maryland) after carefully considering the for-profit option. There were two major considerations in our final decision in favor of a nonprofit structure:

- ♦ **Research Independence:** A private consulting firm must necessarily respond to the whims of the marketplace in defining its corporate identity and creating a research mission. We wished to avoid the necessity of making a profit for shareholders as the primary objective in setting our research goals, relying instead on our research staff's identifying research priorities based on our own capabilities, our own evaluation of scientific worthiness, and the needs of federal, state, and local governments.
- ♦ **Research Objectivity:** As an organization, our commitment to operating at the highest levels of scientific integrity and research objectivity and accuracy is emphasized by their being part of our

organizing statement of purpose. Funding from private-sector sources in support of making a profit leads to a greater risk of compromising that objectivity. Particularly for our government-customers, our nonprofit organization helps us maintain our credibility as an independent, objective voice in technology assessment and policy-making.

Tax-Exempt Status

Scientific research, performed within certain boundaries, is considered of general benefit to the public good. In considerations of these benefits to society, the government recognizes the tax-exempt status of this work. As part of our corporate determination to diffuse the knowledge and understanding of scientific research, and to raise the level of scientific literacy in America, we have *chosen* to pursue scientific research that is within the boundaries of tax-exempt status as carefully as we can determine them. We also expect that the bulk of our research will be performed for agencies of federal, state, and local governments, research that will alleviate the burdens of government by answering questions that help decide good public policy.

Integrating Research and Public Education

Education also benefits the public good and is a tax-exempt activity. In a typical private consulting firm, one might expect that a certain amount of public outreach undertaken by some volunteers of the consulting firm would take place as a benevolent activity. Such outreach would constitute a type of casual education.

Ars Hermeneutica believes strongly that scientific research should contribute not just to expanding scientific knowledge, but that it should benefit general public knowledge and understanding of science as well. In addition to scientific research, we have made public education about science part of our organizing purpose to emphasize the deep connection between education and research, and to develop those connections. We expect all of our staff to contribute both to our research agenda and our education agenda, believing that knowledge gained in one will benefit our work in the other.

Question 10: Please provide a copy of the lease related to your occupancy expenses.

We have as yet no lease agreement. Reference to the cost of leasing office space on line 20, Part IX of Form 1023 was our *pro forma* best estimate of the likely cost of leasing facilities, based on an average rate (at that time) of \$17/square-foot for office space in suburban Washington, DC.

At the time when we prepared our original Form 1023, we had hoped to move into facilities in mid 2006. The numbers and implied schedule given in the original Form 1023, Part IX ("Financial Data") would best be construed as years following initial determination of tax-exempt status.

Question 11: Please provide a history of your activities for the year 2005, and for the year 2006 to date.

In 2005 we decided to bootstrap our start-up operations by giving priority to our program in casual public science education, developing two key initial projects. To date, Ars Hermeneutica has had no grants or research contracts, so all work has been performed by volunteers.

Science Besieged

The first project, started in August 2005, is called "Science Besieged".³ It is an online resource, a collection of short articles whose purposes are to illustrate scientific ideas and their relationship to society in engaging and digestible presentations. Science Besieged encapsulates several of our ideas about casual science education.

We quote the following from the online page⁴ describing the purpose of Science Besieged:

This online resource is a browsing encyclopedia, a collection of articles on topics that examine the role of science in society and that expose, document, and elucidate attacks on science, largely through presenting the positive work and words of scientists, science supporters, and science advocates. Our goal is not to antagonize, cajole, inveigle, or nag.

Science Besieged tells stories that show how the threads of science and technology are woven into the fabric of society. As an antidote to anti-scientism we invite readers to explore and discover the value and excitement of science for themselves.

Ars Hermeneutica's organizing mission includes doing all we can to educate the public about the goals, methods, and results of science, engineering, and mathematics. The Science Besieged Project is an expression of that commitment.

³ The main web page for Science Besieged can be found at this URL:
<http://arshermeneutica.org/besieged/Main_Page>.

⁴ From the web page "Science Besieged Project:About", found at this URL:
<http://arshermeneutica.org/besieged/Science_Besieged_Project:About>

In the past few months we have introduced a new feature of Science Besieged: "Book Notes". As we described them online, "Book Notes are our brief assessments of books about science and technology and their relationship with society, books that are enjoyable and enlightening."

To date there are some three dozen content pages, which includes about a dozen book notes. Ten volunteers have written or are writing content for Science Besieged. Appendix 1 contains several sample pages from Science Besieged.

At this stage Science Besieged is still an evolving concept. We have been developing this online resource to demonstrate the concept and its scope. Our next goal for Science Besieged is to seek funding to expand the content and pay for personnel who can give it more attention.

Elected New Directors

At the annual meeting of the Board of Directors of Ars Hermeneutica, held on 29 April 2006, we elected four new directors for of the corporation, bringing the total number of directors to six.

Aligned with our initial priority to emphasize our casual education programs, the four new directors have diverse backgrounds in education. Details about the new board members are given in Appendix 2, where we reproduce our press release announcing the election.

Learning About the Sun

In 2006 we began work on projects concerned with learning about the Sun. The Sun is an ideal tool to use in our casual science-education mission: it's *there* every day, everyone is aware of it, everyone takes an interest in it, but most people know rather little about the Sun.

In many ways the Sun is a simple thing, a big furnace that burns hydrogen fuel through nuclear fusion. However, understanding the Sun and its importance in our lives draws on many scientific disciplines and provides endless opportunities for learning moments.

- ♦ Nuclear physics: How does the sun work?
- ♦ Thermal physics: How hot is the sun?
- ♦ Magnetism: What are sunspots?
- ♦ Hydrodynamics: Why do sunspots move?
- ♦ Plasma physics: What is the solar corona?
- ♦ Space physics: What is the solar wind?
- ♦ Environmental science: What is the "greenhouse effect"?

The list goes on. As a broad topic and a strategic educational program for Ars Hermeneutica, we will be developing projects that use the Sun as an educational tool.

Our first project, which we began in May 2006, is a DVD of short films of the Sun. The video program will be developed from several sources, including a NASA solar observatory and special eclipse imagery from a solar physicist prominent in the field who has volunteered to provide these special images for this project.

Our goal is to create a DVD with short films that illustrate interesting features of the Sun: the solar surface, sunspots, solar flares, the solar corona, etc. The disc is not overtly didactic, but contains additional material for self-directed learning. We plan to develop adjunct teaching materials to accompany the disc in classrooms.

Ars Hermeneutica will create the films for the project. NASA is consulting with Ars Hermeneutica on the selection of suitable source material. Technical production and replication of the DVD will be handled by a small video production company as a project partner. Ars Hermeneutica will develop the adjunct educational materials, the associated website, and distribute the DVD to classrooms and other educational outlets across the country.

We are currently creating the first demonstration films for the project, a preliminary step in locating funding to support the production of the DVD. We expect to seek separate funding to support educational distribution of the disc and its adjunct materials.

Appendix A: Sample Pages from Science Besieged

The following pages are facsimiles of the content of some pages from the online Science Besieged resource, a project of Ars Hermeneutica. The pages give some indication of our approach to casual science education and trying to engage the public's interest in science through short, interesting articles about science and its relationship to society.

We also include three examples of our Book Notes, written to spark a reader's interest in reading engaging books that deal with science and society.

The pages included here, and their online locations, are:

- ♦ A Facsimile of the Main Page for Science Besieged
http://arshermeneutica.org/besieged/Main_Page
- ♦ Article: Legislating the Value of Pi
http://arshermeneutica.org/besieged/Legislating_the_Value_of_Pi
- ♦ Article: Surveying the American West
http://arshermeneutica.org/besieged/Surveying_the_American_West
- ♦ Three Sample Book Notes
 - Squyres: *Roving Mars*
http://arshermeneutica.org/besieged/Squyres:_Roving_Mars
 - Ferguson: *Tycho and Kepler*
http://arshermeneutica.org/besieged/Ferguson:_Tycho_and_Kepler
 - Sacks: *Uncle Tungsten*
http://arshermeneutica.org/besieged/Sacks:_Uncle_Tungsten

The URL for the Science Besieged project is:
<http://arshermeneutica.org/besieged>.

Main Page

Science Besieged is a project of Ars Hermeneutica directed at countering anti-scientism in whatever guise it appears and at increasing understanding about science and the scientific enterprise while decreasing hostility towards it. This online resource is a browsing encyclopedia, a collection of articles on topics that examine the role of science in society and that expose, document, and elucidate attacks on science, largely through presenting the positive work and words of scientists, science supporters, and science advocates. Our goal is not to antagonize, cajole, inveigle, or nag. *Science Besieged* tells stories that show how the threads of science and technology are woven into the fabric of society. As an antidote to anti-scientism we invite readers to explore and discover the value and excitement of science for themselves.

--From [Science Besieged Project: About](#)

Finding Articles	Contributing Articles
<ul style="list-style-type: none"> • Book Notes offers ratings and readers' notes about books on science and society that Ars Associates have been reading • Surveying the American West describes the role of geography in the Westward expansion of America in the late 1800's • Legislating the Value of Pi is a Time-Capsule curiosity from the late 19th century • Evolution and the Vatican examines papal teachings over the last 130 years <p>The Project Outline is a handy summary of available and planned articles. Two guides to recent updates are New Pages and Recent Changes. All pages does what it says</p>	<p>Contributions are welcome. For some guidelines, please see the Submission Guidelines and the agreeably brief Style Manual.</p> <p>Our thoughts on approaching this project are contained in About Science Besieged. The Project Outline might give you an idea for an article if you're at a loss.</p> <p>Abbreviated information about Ars Hermeneutica is in the page about Ars Hermeneutica; more information can be found on the parent website.</p> <p>Articles at Science Besieged are not in the public domain; please see Science Besieged: Copyrights.</p> <p>Contact us by e-mail through the Comment Form.</p>

Legislating the Value of Pi

From Science Besieged

The greek letter π is the mathematical symbol used to represent the number that is the ratio of the circumference of a circle to the length of the circle's diameter. The number is known to be an irrational number^[1], approximated by the fraction "22/7", or by the decimal "3.1415926536".

π , no doubt because of its fundamental place in geometry and the irritation of its irrationality, has inspired a number of mystics and charlatans throughout history, particularly through vain efforts to "square the circle". Proof in 1882 that the task was impossible^[2] apparently did as little to quench interest in the ancient conundrum as thermodynamics did to halt the search for perpetual-motion machines.

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Indiana House Bill #246

The most famous -- and only known -- case of a state legislature in the US attempting to create by law a new value for π was that of Indiana in 1897; it has become legendary, and the basis of myth and hoax. Although it has come to represent the occasional ignorance of innumerate legislators, it was not so obviously a bad idea at the time.

The bill was introduced to the house by legislator Mr. Record, but it was reported that "Mr. Record knows nothing of the bill with the exception that he introduced it by request of Dr. Edwin Goodwin of Posey County, who is the author of the demonstration."^[3] The bill began in the Committee on Canals (aka the Committee on Swamp Lands), whose chairman tried unsuccessfully to send it to the Committee on Education.

Redefining the value of π seems not to have been its principal goal, but a side effect. In fact, the bill seems to have offered four different, new values for π . Rather, the bill was aimed at benefiting its author, who claimed to have patented a new method for "squaring the circle", which he proposed to let the state of Indiana use free of charge if they would pass his bill! Its opening statement is clear:

A bill for an act introducing a new mathematical truth and offered as a contribution to education to be used only by the State of Indiana free of cost by paying any royalties whatever on the same, provided it is accepted and adopted by the official action of the legislature of 1897.

To lend credibility to his claim, Dr. Goodwin gave these credentials:

Section 3. In further proof of the value of the author's proposed contribution to education, and offered as a gift to the State of Indiana, is the fact of his solutions of the trisection of the angle, duplication of the cube and quadrature having been already accepted as contributions to science by the American Mathematical Monthly, the leading exponent of mathematical thought in this country. And be it remembered that these noted problems had been long since given up by scientific bodies as unsolvable mysteries and above man's ability to comprehend.

It seems that Dr. Goodwin had already solved two of the great unsolvable problems of ancient geometry and claimed to have solved a third with his method of squaring the circle.

The bill made it through three readings and votes in the House, and its first reading in the Senate. It was evidently seen as of economical benefit, since Indiana would save royalties on the patent, and the legislators proclaimed themselves unfit to comprehend the details of the bill anyway. The finale was dramatic and down to the wire.^[4]

That the bill was killed appears to be a matter of dumb luck rather than the superior education or wisdom of the Senate. It is true that the bill was widely ridiculed in Indiana and other states, but what actually brought about the defeat of the bill is recorded by Prof. C.A. Waldo in an article he wrote for the Proceedings of the Indiana Academy of Science in 1916. The reason he knows is that he happened to be at the State Capitol lobbying for the appropriation of the Indiana Academy of Science, on the day the House passed House Bill 246. ... The roll was then called and the bill passed its third and final reading in the lower house. A member then showed the writer [i.e. Waldo] a copy of the bill just passed and asked him if he would like an introduction to the learned doctor, its author. He declined the courtesy with thanks remarking that he was acquainted with as many crazy people as he cared to know. That evening the senators were properly coached and shortly thereafter as it came to its final reading in the upper house they threw out with much merriment the epoch making discovery of the Wise Man from the Pocket.

Legacy

Regardless of its short life and eventual failure to become law, Indiana House Bill #246 has left a legacy.

- "Like trying to legislate the value of π " has become a catch phrase used to highlight the patent uselessness of trying to determine mathematical or scientific fact by non-scientific means.^[5]
- It has become an icon, representing misguided attempts on the part of legislative bodies to legislate that which cannot be legislated; moves to legislate the value of π have, at times, erroneously been ascribed to the state legislatures of Oklahoma, Kansas, Tennessee, Kentucky, and Alabama.
- In these times of more visible anti-scientific attitudes, the vague memory of the incident in Indiana lent credibility to an April Fool's Day hoax from 1998 claiming that the Alabama state legislature had, indeed, just passed legislation changing the value of π to equal "3", bringing it into line with the value given in the *Bible*.^[6] The jape has been remarkably persistent^[7] and popular.^[8]

Notes

- 1) "Irrational" means that the number cannot be written as a ratio of two integer numbers, as in "1/2" or "7/8". This implies that when irrational numbers are written as decimal numbers, the digits to the right of the decimal point never repeat and never end. In fact, π is also a transcendental number, meaning that it is not the root of any algebraic equation with rational coefficients; one implication is that age-old efforts to "square the circle" are guaranteed fruitless endeavors.
- 2) See, e.g., "[Squaring the Circle](#)".
- 3) The entire text of the bill, along with contemporary commentary, is in the entry "[sci.math FAQ: Indiana Bill sets value of Pi to 3](#)" by Alex Lopez-Ortiz, 17 Feb 2000, which provides most of the historical details given above.
- 4) This account is quoted by Lopez-Ortiz, referenced in the previous note.
- 5) This Google search for "[legislate value pi](#)" returns more than 25,000 examples, most of which use the phrase to ridicule notions that contradict reality.
- 6) Barbara Mikkelson, "[Alabama's Slice of Pi](#)", *snopes.com*, 28 October 1998.
- 7) Dave Thomas, "[Pi are not squared...Pi was a hoax!](#)", *NMSR Reports* 4, no. 6, June 1998.
- 8) The Museum of Hoaxes lists it as #7 on their "[Top 100 April Fool's Day Hoaxes of All Time](#)", c. 2003.

Sources

- The entry for "[Pi](#)" at *math.com*, has interesting facts, the first 1000 digits of π , and useful links.
- Cecil Adams, "[Did a state legislature once pass a law saying pi equals 3?](#)", *The Straight Dope*, c. 1998.
- John Roach, "[April Fools' Special: History's Hoaxes](#)", *National Geographic*, 1 April 2003, discussed several famous hoaxes, including the one discussed above about the Alabama legislature changing the value of π .

Surveying the American West

From Science Besieged

Before expansion could properly take place, the new nation of the United States of America needed to understand what lay in the blank space to the West--called "unexplored territory" on maps published in the late 19th century. The answer was to conduct surveys and make maps.

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- [4 Special Copyright Notice](#)

Surveying The National Territory

From 1800 to 1818, much of the mapping of the national territory was undertaken by the military on an informal, ad hoc basis, concerned in the main with basic exploration and national land claims. The resulting maps were essentially claims to territory. Federal mapping was a spasmodic affair. Survey teams were sent out on an irregular basis with differing aims, methods, and agendas. The most famous is the Lewis and Clark expedition.

In 1838 the Army Corps of Topographical Engineers was established by Congress and charged with the exploration and development of the continent and the construction of a scientific inventory of the land, with particular attention to the problems of transportation. For the remainder of the 19th century, the mapping of the West remained intimately connected with military control, investment opportunities, and transport improvements. John Charles Fremont led three major surveys in 1842, 1843, and 1845 to the Rocky Mountain, Oregon, and California. The United States and Mexico Boundary Survey was undertaken between 1848 and 1853, and utilized the skills of geologists, botanists, surveyors, and naturalists.

In March 1853, Congress authorized a government survey of all principal rail routes. The Corps of Topographical Engineers was instructed to find the most sensible railroad route from the Mississippi to the Pacific. The survey came under the control of the Secretary of War, Jefferson Davis, who sent out four main parties: a northern survey concentrating on the 47th and 49th parallels; a survey of the 38th parallel; and two surveys along the 35th

parallel--one from the west and one from the east. The result was a widening of botanical, zoological, and geological knowledge, and the creation of a detailed topography of the West.

The Great Surveys

The mapping of the new continent was interrupted by the Civil War (1861--65). After the war, the federal government undertook further surveys of the West that were to set new standards of mapping and result in the formation of the United States Geological Survey. Four large surveys were funded by Congress and are commonly named after their principal leaders (King, Wheeler, Hayden, and Powell). The journalistic reporting and artistic illustration of these great surveys were reproduced in the expanding magazine and book trade, and greatly influenced Americans' perception of the West.

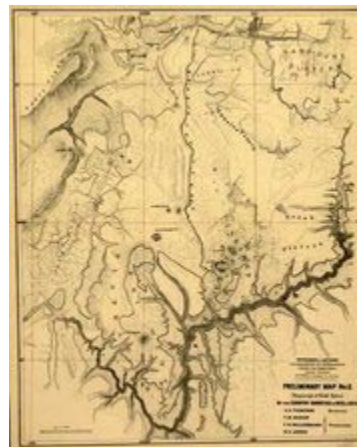


Figure 1. Survey map of the Grand Canyon, produced by John Wesley Powell, published in 1873. Source: Library of Congress.

Clarence King (1842--1901) led his survey along the 40th parallel between 1863 and 1873, covering a large area and focusing primarily on the geological structure of the land. The Wheeler Survey, led by Lieutenant George Wheeler (1842--1905), covered a huge area over the period 1863--73, including California, Colorado, Montana, Idaho, Nebraska, Nevada, New Mexico, Utah, and Wyoming. Wheeler produced the first contour maps of the region and also produced 27 land classification maps that showed the different types of land use.

Ferdinand Hayden (1829--87) also led his expedition into Colorado (1873--76). He was a geologist whose scientific surveys provided valuable data on the geology, botany, and zoology of the West. Hayden felt that his primary responsibility was to publicize and promote the West. His reports and maps helped to bring the grandeur of the Rocky Mountains and the Yellowstone region to wider public attention.

John Wesley Powell (1834--1902) undertook two surveys, beginning in 1869 when he traveled down the Colorado River. In 1871 Powell set out again, with federal backing, north of the Grand Canyon. In 1878, he published his report on *The Arid Regions of The United States*. Thus, by the end of the 1870's, the West had been comprehensively explored, mapped, described, and classified.

Source

Excerpted from John Rennie Short, *The World through Maps: A History of Cartography* (Buffalo [New York]: Firefly Books, 2003), pp. 158--160.

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Squyres: Roving Mars

From Science Besieged

Steven W. Squyres, *Roving Mars: Spirit, Opportunity, and the Exploration of the Red Planet*. Hyperion, August 3, 2005. 434 pages.

Squyres is a professor of astronomy at Cornell University in Ithaca, NY. He is the principal investigator for the Mars rovers Spirit and Opportunity. This book recounts not only the Mars missions of the title, but also the 15-year struggle of a dedicated scientist to do good science in a highly political environment. I found the book particularly compelling because of my intimate knowledge of the NASA funding process, which may make it less interesting to some. Squyres does an honest job of recounting exactly how the process works and revealing all its ugly underpinnings while still managing to romanticize the experience. It brought back for me all the excitement of working on a space project as well as all the frustration.

Scientificity:	
Readability:	
Hermeneutics:	
Charisma:	
Recommendation:	
<i>Ratings are described on the Book-note ratings page.</i>	

-- Notes by JMB





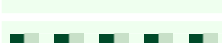
Categories: [Book Notes](#)

Ferguson: Tycho and Kepler

From Science Besieged

Kitty Ferguson, *Tycho & Kepler :
 The Unlikely Partnership That
 Forever Changed Our
 Understanding of the Heavens*. New
 York : Walker & Company, 2002.
 xiv + 402 pages.

Kitty Ferguson, a graduate of the
 Juilliard School of Music, had a
 successful career as a musician. In
 recent years, however, she has
 devoted herself to writing about
 science and science issues.

Scientificity:	
Readability:	
Hermeneutics:	
Charisma:	
Recommendation:	
<i>Ratings are described on the Book-note ratings page.</i>	

This work, in essence a double biography, not only draws vivid portraits of two remarkable figures in the history of science but also deftly explains the importance of the discoveries, inventions, and measurements made by Tycho Brahe and Johannes Kepler.

Her writing is lively and quite readable. The positive appreciation for her subjects comes through very clearly, making them not just figures from the murky past, but living, breathing personalities worthy of our attention today.

-- Notes by *SJB*

[Categories: Book Notes](#)

Sacks: Uncle Tungsten





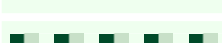
From Science Besieged

Oliver W. Sacks, *Uncle Tungsten :
 Memories of a Chemical Boyhood*.
 New York : Alfred A. Knopf, 2001.
 viii + 337 pages.

Oliver Sacks is a neurosurgeon and
 writer. His writing is engaging,
 lucid, and enlightening. In this
 volume he recounts events from his
 own youth with an immediacy that
 turns the personal into the universal
 -- and enough amusing yet
 harrowing anecdotes to convince
 parents never to give chemistry sets to their children! I thought it was a page-turner, but
 with depth: bits of it have stayed with me long after I finished reading it.

-- Notes by JNS

[Categories: Book Notes](#)

Scienticity:	
Readability:	
Hermeneutics:	
Charisma:	
Recommendation:	
<i>Ratings are described on the Book-note ratings page.</i>	

Appendix B: Ars Hermeneutica Press Release

The following page is the press release that announced Ars Hermeneutica's election of four new members of its Board of Directors. It gives a brief indication of the diverse backgrounds of these four education professionals, who were all elected to three-year terms of office.

Press Release**For Immediate Release****Ars Hermeneutica Elects Four New Directors****Bowie, MD, 1 May 2006:**

At its Annual Meeting on 29 April, Ars Hermeneutica, Limited elected four new members to its Board of Directors, bringing the total number of directors to six. As the company focuses on casual-science educational programs during its start-up phase, so too its newly elected Board members have backgrounds in education and are working to advance the company's educational mission.

"Our new Directors emphasize the educational part Ars Hermeneutica's mission, and they bring with them an exceptional breadth of experience," said Jeffrey Shaumeyer, PhD, President of Ars Hermeneutica. "We are very excited and honored that these four seasoned professionals have agreed to join with us in working towards a scientifically literate America."

The four new directors, in alphabetical order, are:

- ◆ Joyce Gross, MA
National Outreach Coordinator, retired, Education Department
National Oceanic and Atmospheric Administration (NOAA)
- ◆ Michael Hall, MA, PhD
Headmaster Emeritus, Academic Dean,
& Chair of Social Studies Department
St. Anselm's Abbey School, Washington DC
- ◆ Loretta Pecchioni, MS, PhD
Associate Professor, Dept. of Communications
Louisiana State University, Baton Rouge
- ◆ Kathleen Walton, MA, PhD
formerly Interim Provost & Vice President for Academic Affairs
California State University, Dominguez Hills

About Ars Hermeneutica, Limited — Ars Hermeneutica, Limited, located in Bowie, Maryland, is a nonprofit scientific research and science education corporation whose mission is to advance science and to promote the public's understanding of science through innovative research and unique programs in casual public education. We envision a scientifically literate America.

END

The company website is <<http://ArsHermeneutica.org>>.