H·A·D NEWS

The Newsletter of the Historical Astronomy Division of the American Astronomical Society

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HAD Plans for Washington, DC

We look forward to seeing many people at the HAD events planned for the 199th meeting of the AAS in Washington, DC. Preliminary information can be found on the AAS website (http://www.aas.org/meetings/aas199/prelim/prelim.html), and more information will be posted there as well as in the November issue of *HAD News*. The plans include:

A theme session (HAD I) on Sunday, January 6 (3:00–4:30 PM) titled, "New Views of Historic Research in the 21st Century." This session will contain both invited and contributed papers. Among the invited speakers will be Ron Brashear, Brenda Corbin, and Marc Rothenberg. After the paper session there will be a special joint reception with the American Institute of Physics (AIP) at which Spencer Weart and Joe Anderson will be on hand to talk about "New Resources in Historical Research."

Monday, January 7, will start with another theme session (HAD II, 10:00–11:30 AM) on "The Development of American Astrophysics: Ideas, Instruments, Observatories, and Astronomers." This contributed session will also feature the Doggett Prize Lecture by Don Osterbrock: "The View from the Observatory: History is not only for Historians." The HAD Business Meeting will then take place from 1:00-2:00 PM. A second paper session will follow in the afternoon (HAD III, 2:00–3:30 PM) which will be will be devoted to contributed papers on a variety of topics. All sessions are organized by Barbara Welther (bwelther@cfa.harvard.edu).

HAD will also have two special Smithsonian Institution Tours on Tuesday, 8 January 2002. Ron Brashear will hold an open house, 10:00 am to12:00 pm, at the Dibner Library of the History of Science and Technology on the first floor of the National Museum

(Continued on page 11)

Donald E. Osterbrock awarded the LeRoy E. Doggett Prize for Historical Astronomy

HAD News is pleased to announce that Donald E. Osterbrock has been selected as the winner of HAD's LeRoy E. Doggett Prize for Historical Astronomy. More news and details of the award will follow in a later issue. The presentation of the award will take place at the January 2001 AAS meeting, where Dr. Osterbrock will present the Doggett Prize Lecture, "The View from the Observatory: History is not only for Historians."

HAD Web Page Updates

The last *HAD News* gave the URL for the HAD home page with a few extra characters than were necessary. Although the address works, there is a shorter address to use to get to the HAD home page: **http://www.aas.org/had/had.html**

Since HAD is charged, through its Obituary Committee, with selecting authors, lengths, and other criteria relating to the AAS member obituaries to be published annually in the final issue of the *BAAS*, we are happy to announce links from the HAD home page to an Index of AAS member obituaries, prepared by Lynn Scholz. Not only that, but we are constructing links from the names in the Index to the actual online text of the obituaries on the ADS (NASA Astrophysics Data System) web site. Not all names are indexed yet, but this will be an ongoing process. We hope that everyone finds this to be a useful tool for their research and interests.

***Nota bene*: This issue is a combined issue for May and August. The November *HAD News* (No. 58) will follow in a few months as a single issue once again.**

BOOK REVIEW I:

Dorrit Hoffleit
Yale University

Parallax: The Race to Measure the Cosmos, by Alan W. Hirshfeld. W.H. Freeman and Company, Publishers, New York, 10010, 2001. xi + 314 pp. ($23.95 hardback.)

Parallax, an intriguing astronomical detective story, tells of the two millennium long struggle by astronomers to find the first reliable distance to a star. Then, after only about 150 more years, HIPPARCOS has brought the current total to 2.5 million, with the expectation that the European Space Agency will by the year 2009 produce a billion more stellar parallaxes for stars extending out to distances of 30,000 light years!

From about 600 BC until the time of Aristarchus (about 270 BC) it was assumed that the Earth was at the center of the universe and that the Sun and the other known planets revolved around the Earth. Aristarchus was the first to place the Sun at the center and described the Earth as one of the planets circling the Sun. But he was not taken seriously until Copernicus (1473–1543) came to the same conclusion. But even Copernicus was not generally believed. If the Earth were indeed revolving around the Sun, the "fixed stars" should show annual changes in direction corresponding to the motions of the Earth. Why did it take some 2000 years before such changes were finally observed, enabling Bessel in 1838 to determine the first parallax of a star, 61 Cygni, and shortly thereafter Struve, the second, Vega, and Henderson, the third, α Centauri?

Alan Hirshfeld's *Parallax: the Race to Measure the Cosmos* reveals the difficult steps taken to prove that the Sun is indeed the central object of our solar system, and thereby finally determining the almost incredibly great distances to the stars. It is written in a beautifully lucid, engaging style, making it difficult for even someone already familiar with the general history to put the book aside before finishing reading it. He even includes a few personal anecdotes for comparison with the old–for example, his own discovery of a hidden telescope, like Wilhelm Struve's similar discovery in 1813, of a telescope ordered and delivered but never even unpacked!

The parallax of a star being the angle at the star subtended by the radius of the Earth's orbit, the parallaxes are inversely proportional to the distances of the stars. The little geometry Hirshfeld includes in this book he readily explains with diagrams, so that a lay reader who is uneasy about mathematics need not feel like laying the book aside, while the professional will appreciate the history itself, which brings alive some characters of old. For example, the Mathematician to Cardinal Gonzaga said to Galileo that he should not continue calling his glass a spyglass, his being an improvement over Lipperhey's earlier discovery. Galileo should more properly call his a *telescope,* from the Greek *tele* meaning far away, and *skopeo,* meaning to look. For his work on developing the telescope Galileo was at first highly honored by the Church. Hence he felt that the Copernican system was finally close to Clerical acceptance. But as Hirshfeld expresses the situation, "swirling over the horizon was the 'adverse storm' he had believed would never come."

Many astronomical facts had to be learned and instruments designed especially for solving the parallax problem before the first distance to a star could be determined with acceptable accuracy. In attempts to ascertain whether the Sun, rather than the Earth, is at the center of the solar system the quest led to the discovery of thousands of close double stars, numerous nebulae, and "extra-galactic nebulae" (galaxies); and to the fact that all stars are not just like the Sun (some are large giants, others small dwarfs). To ascertain the first reliable parallaxes, ingenious new types of telescopes had to be designed. Joseph Fraunhofer, remembered mainly for the Fraunhofer lines in the solar spectrum, after a deplorably sad youth finally became the world's outstanding telescope maker and the inventor of the split-objective heliometer with which Bessel determined the first dependable parallax.

Just two months after Bessel's successful determination of the parallax of 61 Cygni, L.J. Daguerre discovered his process for making photographs–too slow a process for parallax work, but constituting a beacon for the future. Bessel himself had his portrait taken in 1845. Hirshfeld comments that Bessel was "perhaps unaware that the photographic process spawned by the daguerreotype would someday render his heliometer obsolete." By 1900 the heliometer had provided scarcely one hundred parallaxes whereas after the development of dry plates and their application to astronomy (ca. 1876), by 1950 several thousand parallaxes had been determined from photographs. Now this, too, has gone the way of all flesh. HIPPARCOS, in a span of only four years, obtained parallax data for 2.5 million stars spanning a distance of 300 light years. A printed catalogue of parallaxes for 118,218 of the stars, accurate to $\pm$ ".001, has been published. Hirshfeld describes this achievement as "equivalent to reading from Los Angeles a one-inch high newspaper headline in New York or making out a sunbather on the Moon." Future space flights in 2003–2009 are expected to produce some two billion more parallaxes, with greater precision than ever before and for stars ranging out to 100,000 light years! Current problems, it would seem, are no longer how to obtain data, but how best to cope with so very much!

Summary

Professional scientists and historians of science as well as amateur astronomers should find Hirshfeld's *Parallax: the Race to Measure the Cosmos* of great interest, even though the "race" was at first exceedingly slow: two thousand struggling years to achieve only the first three parallaxes. By 1900 the number had increased to about one hundred. With the advent of dry plate photography, the numbers of stellar parallaxes determined by photography soared into the thousands. But now, in the era of space flight, HIPPARCOS, in operation only four years, yielded parallax and other data for 2.5 million stars electronically, and the acceleration continues exponentially with a billion more expected by 2010. The past few decades have indeed demonstrated a successful "race" which is continuing at a still faster pace. Figure 1 (next page),

illustrates the logarithmic progress of the acquisition of stellar parallaxes from Bessel to the present, together with the prediction for 2010 AD. The Figure is based upon Hirshfeld's table on page 284, with the addition of Louise Jenkins' *General Catalogue of Trigonometric Stellar Parallaxes* (Yale, 1952) containing mainly photographic determinations through 1950.

The book is profusely illustrated with black and white graphs, portraits, and pictures (non glossy), and contains a list of more than 250 references.

Figure 1 (right). The exponential progression of the determination of stellar parallaxes

1. By heliometer
2. By photography
3. By HIPPARCOS
4. Anticipated from future space flights

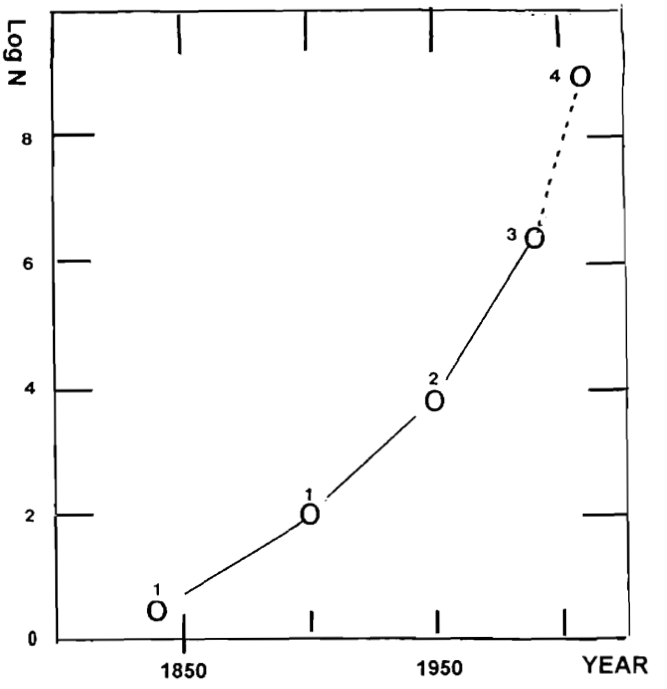

Figure 1

BOOK REVIEW II:

Dorrit Hoffleit
Yale University

Maria Mitchell, A Life in Journals and Letters, Henry Albers, (College Avenue Press, Clinton Corners, New York, 2001) xiii + 370 pp. ($27.95 hardback)

Maria Mitchell (1818–1889), the first American woman astronomer, was the third of ten children of Quakers William and Lydia Coleman Mitchell. Her father was a versatile person, having at various times been a cooper, soap broiler, oil and candle manufacturer, farmer, school master, insurance broker, surveyor, chronograph rater, astronomical observer for the Coast Survey, and finally bank cashier. He was a good friend of the Bonds at Harvard, the first two Directors of Harvard Observatory where Mitchell was appointed an Overseer and was made chairman of the Observatory Visiting Committee.

William Mitchell rated chronometers for the Nantucket whalers, worldwide the most productive whalers of that era. Maria early learned how to check chronometers and volunteered as a child to do so whenever her father was off island. In 1831 there was an annular eclipse of the sun visible from Nantucket. The 12½ year old Maria helped her father timing the contacts of the moon, observations needed for the determination of the longitude of their house on Vestal street, their observatory. These were the early beginnings of her career as an astronomer. The story of her discovery of a comet in 1847 and the fact that the President of Harvard, Edward Everett, aided in sponsoring her for the Medal awarded by the King of Denmark is well known–the beginning of her fame as America's first woman astronomer.

Heretofore there have been two biographical treatises on Maria Mitchell: Phebe Mitchell Kendall's *Maria Mitchell, Life, Letters, and Journals,* 1896, and Helen Wright's *Sweeper in the Sky,* 1949 (reprinted four times through 1997). Professor Henry Albers, recent Director of the Vassar College Observatory, has devoted his retirement to a more comprehensive study of archival materials on and by Maria Mitchell. The three books now available contain much in common, but nevertheless each has accounts not included in the others. Thus Helen Wright's *Sweeper in the Sky* includes more accounts than the others on Maria's contacts with children, of whom she was obviously fond. Wright also quotes some twenty-seven verses or longer poems either by or quoted by Maria in her diaries or letters. Albers quotes only six, of which just one is common to Wright, while Kendall quotes five, of which three are in Wright's, with only one common to all three compilers. Among them they cite thirty-one verses of which fourteen are either definitely or probably composed by Maria herself.

Phebe Mitchell Kendall, a ten-years-younger sister of Maria, became custodian of Maria Mitchell's diaries. In publishing those diaries she edited out sections she felt should not become common knowledge, actually destroying some of them. However, neither Wright nor Albers included everything in those diaries and letters as published by Kendall. For example, Albers cites about 340 items in the diaries or letters that are not cited by Kendall, while Kendall has thirty-five not cited by Albers. Only twenty-six references are common to both.

Albers's treatise concentrates on the more scholarly and academic aspects of the life of Maria Mitchell, providing helpful commentary. Whereas observational astronomy was her major interest in her younger years, after her appointment as the first Professor of Astronomy at Vassar, teaching and the advancement of women became her major concern, with woman suffrage a close second.

At only age seventeen Maria Mitchell advertised in the local newspaper that she proposed opening a school for girls six years or older, teaching not only all the subjects normally considered appropriate for grade schools, but also the high school studies natural philosophy (as physics was then called), algebra, and geometry. This adventure lasted but a single year as she was appointed the first librarian at Nantucket's Athenaeum, a job she held for twenty years until she was called to Vassar Female College. Becoming a librarian was an incentive for a tremendous amount of self-education as she studied many of the books that came to the library, including the works of Laplace, Bowditch, and Gauss. Her self-education amounted to the equivalent for a college degree.

After her success in discovering her comet in 1847, her fame became assured. The U.S. Nautical Almanac was started in 1849 and Maria was invited to share in the necessary computations, being assigned those for the planet Venus. This work she carried out for nearly twenty years, resigning only when, after three years at Vassar, her work there was not only assured but required more of her time.

Maria did her best to conform to Quaker beliefs, but found some of their rules unreasonable. Albers noted that at age twenty-five she was disowned by the Friends Meeting for not conforming to all their regulations (Quakers called themselves the Society of Friends; friends indeed!). Although Albers does not mention it, both Kendall and Wright indicate that a piano had much to do with her final resignation from the Quakers. The Founder of the Quaker sect, George Fox (1624–91), who was mainly responsible for its rules and regulations, according to Kendall "had blown a blast against music" and Wright quoted some Friends as saying that "music stirred up lower impulses." The Mitchell children were fond of singing and eventually acquired a piano. Maria herself was not musical but she was the one who generously funded the purchase of the piano. It was largely her own Uncle Peleg who pressurized her dismissal from the Quakers. Thereafter she attended the services at the Unitarian Church. Sadly, after she was employed at Vassar College her allegiance to this church was disapproved by her colleagues.

In 1857 a Chicago banker hired Maria to chaperone his young daughter on travels in America and Europe. From Chicago they traveled to New Orleans and then to the Eastern states. Later they sailed to England. While there, the banker in Chicago encountered financial losses and his daughter had to return home; but Maria stayed on to finish her planned tour. She was already well known by reputation and was well received by many of the most distinguished astronomers of the time, including England's famous woman astronomer Mrs. Mary Someville, astronomers Airy, Secchi, Leverrier, Encke, Humboldt, and William Struve (Director of the Pulkova Observatory). She was the first woman to have been admitted to visit the Vatican Observatory, a privilege previously denied Mrs. Somerville. In 1873 she would make another European tour, this time accompanied by her young nephew, Willie Kendall.

Matthew Vassar, despite opposition, wanted to make the College he was founding "not only a College to educate women, but a College of Instruction by women." The first Presidents of Vassar Female College were not enthusiastic about the appointment of women professors, but Matthew Vassar prevailed. He was intensely impressed by Miss Mitchell's qualifications. She was appointed Professsor of Astronomy in April, 1865, and began teaching when the college formally opened in September.

At first satisfied with her salary, she soon discovered that the men professors were being paid significantly more. Typically, for the rest of her life she fought unsuccessfully for equality of pay for equality of work. Nevertheless, as late as 1915 her appointment was described as "a costly luxury." How contradictory this opinion is to her own altruistic statement in October 1868, "In case of my outliving Father and being in good health, to give my efforts to the intellectual culture of women, without regard to salary."

Maria's first class at Vassar had seventeen students aged sixteen to twenty-two. She commented that she doubted that Harvard had as many in its mathematical astronomy classes. Even in my undergraduate years (1924–28) neither Harvard nor Radcliffe did have that many after the introductory course in descriptive astronomy.

In 1880 Maria Mitchell attended a lecture in Professor Byerley's course at the Harvard Annex (later named Radcliffe College). She was not appreciative, commenting, "Why should Byerley or anyone lecture that which is in a book?" This is reminiscent of her own self-education in the years she was Nantucket's librarian.

Concerned that teachers were required to teach too many students, she remarked,

> We should increase the number of teachers by lessening the number of students to each, and diminish the number by retiring the old and worn out.... Our colleges are too expensive for the class which most needs them. We ought to reach the large middle class. We do not.

Although she was unquestionably the most influential person in advancing educational opportunities for generally discriminated-against women, it is somewhat surprising to find the two following of her recommendations:

> Do not attempt to put the daughters of the very poor through a college course. It is barely possible that a rare genius may be found even among the unworthy poor, but the chance is so small that we shall waste time in looking for it.

Why would the poor necessarily be unworthy? Or would she be correlating worth with wealth? And in regard to the less healthy,

> Do not aid the sickly girl to enter college.... I should dissuade the delicate girl from the attempt to take a regular college course. Let her study in the open air.

If these precepts had been strictly followed throughout the years, I, for one, would not have been given the opportunities to become successful. As for the sickly, what about the blind deaf-mute Helen

Keller (1880–1968), Radcliffe AB cum laude 1904, author of several books? Obviously scholastic ability is not limited to the financially middle and upper classes or to the physically healthy. In one letter in 1888 Maria Mitchall made the more modern remark, "But a better way is coeducation." Eighty years later Vassar College was the first women's college to become coeducational. On the whole one can only laud Miss Mitchell's achievements in regard to higher education for women.

It is amusing to note a comment she made in an article on women in science:

> It is better to be spending an hour in watching the habits of an insect than in trying to put up the hair fantastically.

In comparing all the photographs of Maria in Albers's book, one notices that in her younger years (1847) she put up her apparently straight hair primly with no suggestion of vainly displaying curls. Margaret Harwood, the first Director of the Nantucket Maria Mitchell Observatory, met numerous descendants of William and Peleg Mitchell. From them she gained unpublished anecdotes about Maria. One was to the effect that after a certain age, Maria gave herself one more curl a year. Her portraits while she was at Vassar (1867) suggest that she, herself, must have spent appreciable time arranging those fantastically beautiful curls.

The success of a great teacher is to some extent judged by the achievements of her students. Three of Mitchell's deserve special mention, two of whom are mentioned by Albers. Mary Whitney (1847–1921) upon Mitchell's recommendation became her successor as the Director of the Vassar Observatory. Margaretta Palmer (1862–1924) had been Mitchell's assistant, and in 1888–89 was a teacher at Vassar. Albers does not mention that Miss Palmer was subsequently employed at Yale, and when Yale started its programs for graduate students, women were also admitted to the Graduate School of this otherwise male institution. Palmer received her Yale Ph.D. in 1894, the first woman to get a Ph.D. degree in astronomy from any American university. Among the last of Maria Mitchell's Vassar students before her retirement was Harvard astrophysicist Antonia C. deP. P. Maury (1866–1952), not mentioned by Albers. Maury became famous for her discovery of the c-characteristic in stellar spectra, the first to reveal a criterion for recognizing supergiant stars. I knew Miss Maury well in her later years. She told me that all the successive Professors of Astronomy at Vassar were excellent teachers. However they all lacked "that special spark" that characterized Maria Mitchell's teaching.

Dr. Henry Albers is to be congratulated for his scholarly presentation of the diaries and letters of Maria Mitchell, bringing her character clearly back to life.

References

Kendall, Phebe Mitchell, 1896, *Maria Mitchell, Life, Letters, and Journals,* Lee and Shepard Publishers, Boston, vi + 293 pp.

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NEW AIP REPORT SHOWS THAT DOCUMENTING LARGE-SCALE SCIENCE IS DIFFERENT

Those responsible for preserving the record of scientific research must take into account dramatic changes in its organizational structures. The multi-institutional collaboration has become the organizational structure of choice in a number of fields of science and engineering. Instead of evaluating the contributions of a scientist as an individual researcher, or the records of a research project conducted by one institution, archivists are confronted with the records of collaborations that may continue for a decade before disbanding and involve multiple institutions, disciplines and even nations. This does not necessarily mean more work for archivists and others responsible for records. But it does mean they need to understand how the new organizational structures affect the creation and use of records.

To help find solutions, the Center for History of Physics of the American Institute of Physics has issued *Documenting Multi-Institutional Collaborations*, the final report of its decade-long study of multi-institutional collaborations in physics and allied fields. The main goal of the project was to learn enough about these transient mini-institutions to be able to advise how to document them. The study was built on interviews with over 600 scientific collaborators; numerous site visits to archives, records offices, and federal agencies; and advice from working groups of distinguished scientists, archivists, records officers, historians and sociologists. The study group gathered and analyzed data on characteristics of collaborations such as their formation, decision-making structures, communication patterns, activities and funding.

The final report consists of three parts: Findings (Historical-Sociological and Archival) of Fields Studies by AIP, Appraisal of Records Created, and Current Archival Practices and Project Recommendations. Archivists and records officers may find most valuable the fact that we provide three approaches to appraisal: a typology of collaborations, a functional analysis of records creation, and the more standard appraisal guidelines. The section on archival practices assesses the capability of saving adequate documentation of collaborations in academic archives, federal agencies, and corporate archives. Project recommendations are addressed to research centers, to federal funding agencies, and to the National Archives. The several appendices include a bibliography of selected readings.

The full final report, *Documenting Multi-Institutional Collaborations*, is accompanied by *Highlights and Project Recommendations*, which provides excerpts from the full report and a set of recommendations. **Both reports are available upon request from the AIP History Center, One Physics Ellipse, College Park, MD 20740-3843; phone: 301 209-3165, fax: 301 209-0882; e-mail: chp@aip.org**. These and other project reports will also be found on our Web site at:

http://www.aip.org/history/pubslst.htm#collabs.

The long-term study was funded by the AIP, the Andrew W. Mellon Foundation, the National Science Foundation, the National Historical Publications and Records Commission, and the Department of Energy.

RECENT PUBLICATIONS RELATING TO THE HISTORY OF ASTRONOMY

R. S. Freitag
Library of Congress
February 2001 (Part II)

NOTE: Some of the entries in the "Articles..." section appeared in the previous list.

Articles, Including Essays in Books and Papers in Proceedings

(continued)

Hoffleit, Dorrit. In memory of Helen Meriwether Lewis Thomas, August 21, 1905–August 6, 1997. In American Association of Variable Star Observers. Journal, v. 28, no. 1, 2000: 40–46. port.

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Hunger, Hermann. Planetenstellungen bei der Geburt. In Munuscula Mesopotamica. Festschrift für Johannes Renger. Hrsg. von Barbara Böck, Eva Cancik-Kirschbaum, Thomas Richter. Münster, Ugarit-Verlag, 1999. (Alter Orient und Altes Testament, Bd. 267) p. 229–239. illus.

Includes illustration and transcription of text on a cuneiform tablet, with transliteration, German translation, and commentary.

Impey, Chris D. Reacting to the size and the shape of the universe. Mercury, v. 30, Jan./Feb. 2001: 36–39. illus., ports.

"As astronomers changed humanity's perception of the universe, the great writers and poets have risen to the challenge."

To be concluded in the Mar./Apr. issue.

Introductory session. In Optical and infrared spectroscopy of circumstellar matter. Proceedings of a workshop held in honor of the 65th birthday of Josef Solf at the Thüringer Landessternwarte Tautenburg, Tautenburg, Germany, 10–12 March 1999. Edited by Eike W. Guenther, Bringfried Stecklum, and Sylvio Klose. San Francisco, Astronomical Society of the Pacific, 1999. (Astronomical Society of the Pacific conference series, v. 188) p. 1–22. illus., ports.

Contents: Sedlmayr, E. Laudatio: Josef Solf.—Elsässer, H. Thirty years of partnership—laudatio.—Böhm, K. H., and S. Matt. Spectroscopic insight and the physics of circumstellar matter: Josef Solf's contribution to astrophysics.

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"The artwork on the [book's] front cover is a pastel sketch of Hyron Spinrad by his wife, Bette Spinrad, entitled 'The Great Observer', circa 1965."—p. xxiii.

Krebs, Robert E. Astrology, astronomy, and cosmology. In his Scientific development and misconceptions through the ages, a reference guide. Westport, Conn., Greenwood Press, 1999. p. 163–212. illus.

Krupp, Edwin C. Managing expectations. Sky & telescope, v. 100, Aug. 2000: 83–85. col. illus., col. port.

Explains why it took so long to realize that the object discovered by William Herschel in 1781 was actually a planet.

Krupp, Edwin C. Negotiating the highwire of heaven: the Milky Way and the itinerary of the soul. In Alexandria. 5. Edited by David Fideler. Grand Rapids, Mich., Phanes Press, 2000. p. 74–102. illus.

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"We read the 'Classical Scholium' to the Propositio VIII of the Third Book of the Principia, in which Newton stated the law of the inverse square in the distance for gravitational attraction between the bodies. In that scholium, already published by P. Casini, he constructed a musical model for the attraction considering sounding strings. We point out a mistake in the argument and discuss why Newton tried to justify his law in such a way."

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HAD in Washington, DC (continued from p. 1)

of American History. From 1:00 to 5:00 pm, there will be a tour at the National Air and Space Museum of the new exhibit by David DeVorkin, "Explore the Universe." Contact Barbara Welther, bwelther@cfa.harvard.edu, about participating.

Also of interest to HAD members will be a tour of the US Naval Observatory offered on Tuesday, January 8, from 8:15 to 10:15 pm. Buses will transport the tour group from the Washington Hilton at 8 pm to the USNO, just a few minutes from the hotel. The guided tour will include the 12-inch and 26-inch refracting telescopes. Viewing through one of the telescopes will be offered, weather permitting. Participants will also visit the USNO Library and the Master Clock of the United States. Cost is $10 per head for the buses and the tour is limited to the first 100 people.

On Wednesday, January 9, from 3:00 to 5:00 pm, Joe Anderson has invited HAD to an open house at AIP for tours of the Niels Bohr Library and Center for History of Physics. He will also give a presentation of "New Resources in Historical Research." For more information and transportation, it is important to contact him directly at janderso@aip.org.

The Occasional Gallery of Odd Astronomical Imagery (number 1):

The constellation of Cetus looks quite ferocious in this image from Peter Apian's *Quadrans Apiani astronomicus et iam recens inventus* (Ingolstadt, 1532). Image courtesy of the Dibner Library, Smithsonian Institution Libraries.

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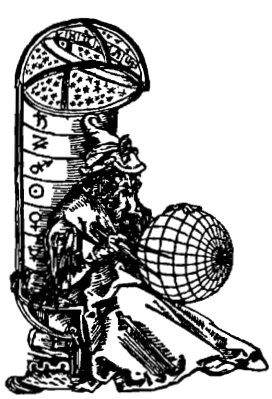

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