Dibner Library
NEWS

Fall 2002-Spring 2003 Joint Issue
Vol.3, No.2 / Vol.4, No.1

A Newsletter from the Dibner Library of the History of Science and Technology

Ken Alder to Give the 2003 Dibner Library Lecture

We are happy to announce that Dr. Ken Alder will deliver the 2003 Dibner Library Lecture on Wednesday, November 5. The title of the lecture is "The Measure of the World." The lecture is based on his recent book, *The Measure of All Things*, the fascinating story of the measurement of the Earth in order to obtain a foundation for the length of the meter. The lecture will be held at 5:00 PM in the Leonard Carmichael Auditorium of the National Museum of American History, Behring Center, at 12th Street and Constitution Avenue, NW, Washington, D.C. A reception will follow the lecture where you will have the opportunity to meet Dr. Alder and the staff of both the Dibner Library and the Smithsonian Libraries. The lecture is free and open to everyone.

Dr. Alder is an associate professor of history at Northwestern University and holds a Ph.D. from Harvard. A novelist and an avid bicyclist, he has biked the entire route that the French astronomers took to measure the Earth. His first book, *Engineering the Revolution*, won the 1998 Dexter Prize for the best book on the history of technology.

New Acquisitions

Thanks to our Special Collections Endowment Fund, we have added a few books this year to our collections. We try not to duplicate titles already held by the Library of Congress, the Folger Shakespeare Library, and other local libraries, but that leaves plenty of important titles out there that are not available in the metropolitan Washington, DC, area.

To add to our holdings in astronomy, the Library purchased Charles Leadbetter's *A treatise of eclipses of the sun and moon, for thirty-five years, commencing anno 1715, ending 1749* (London, 1731). Leadbetter, known primarily as a mathematician and surveyor, gained fame for his accurate prediction of the 1715 total solar eclipse. Two years later he produced the first edition of this work, covering the eclipses from 1717 to 1743.

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Resident Scholar Program 2005

The Smithsonian Institution Libraries' Dibner Library Resident Scholar Program awards stipends of $2,500 per month for up to six months to individuals working on a topic relating to collections in the Dibner Library of the History of Science and Technology. Historians, librarians, doctoral students, and post-doctoral scholars are invited to apply for calendar year 2005. Deadline **March 1, 2004**.

The strengths of the Dibner Library collection are in the fields of mathematics, astronomy, classical natural philosophy, theoretical physics (up to the early twentieth century), experimental physics (especially electricity and magnetism), engineering technology (from the Renaissance to the late nineteenth century), and scientific apparatus and instruments.

Successful applicants for the Dibner Library Resident Scholar Program must make substantial use of the materials housed in the Dibner Library of the History of Science and Technology. Scholars are expected to be in residence at the Smithsonian Institution in Washington, D.C. full-time during their award tenures.

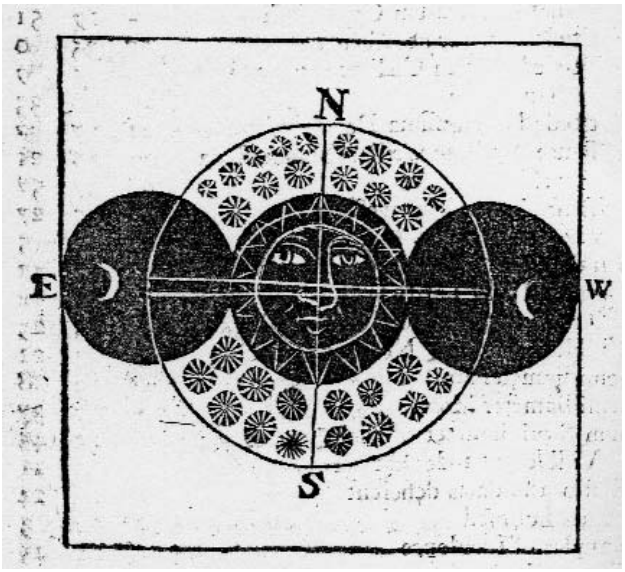
Three Ways to Obtain an Application Form

- **Download** the form from the Smithsonian Libraries' Web site (www.sil.si.edu)
- **Email** libmail@sil.si.edu to request the form.
- **Call** (202) 357-1568 to request the form.

Smithsonian Institution Libraries

New Acquisitions, continued...

The work we obtained is the second edition wherein Leadbetter extended his coverage of eclipses from 1715 (his favorite!) to 1749. It is also very interesting that at the end of the book there is additional coverage of the transits of Mercury and Venus from 1720 to 1799. As an additional bonus, the book contains a preliminary leaf with advertisements for other books by Leadbetter. This advertisement is known only in one other copy at the British Library. The work makes a fine addition to the Dibner Library's works on eclipses and our copies of two other books by him on astronomy and surveying and a third astronomical work edited by him. Copies of this book in the USA are only found at Yale, UCLA, U. Chicago, U. Michigan, and San Diego State.



The April 1715 total eclipse of the Sun from Leadbetter's *A treatise of eclipses*..., 1731.

Our technology collection received a boost from our purchase of a small pamphlet, *An account and description of an improved steam engine*... (London, 1776) by the incredibly unknown fellow, Nikolai Detlef Falck. This is a fascinating little work that is an excellent supplement to our many works on steam engines and steam technology. James Watt's great contribution to steam technology was his use of a separate condenser, patented in 1769, on the old Newcomen engine, thus preventing the large waste of steam that occurred with the old design. Watt took many years to actually produce a machine that worked according to his design, and in the interim, other alternative schemes arose. Falck's work is interesting as an example of someone who thought Watt's improvements would not work in the long run. This book details his disagreement with Watt's patent and how he feels that atmospheric pressure will provide more impetus than the pressure produced by the Watt engine. He may not have been right, but his work remains interesting nonetheless. One fascinating aspect of Falck's engine did eventually make it into practice, however: the idea to use two cylinders to provide continuous torque to a drive shaft by means of a system of chains. OCLC, RLIN, and NUC only list copies of this work at Harvard, Princeton, and U. of Michigan.

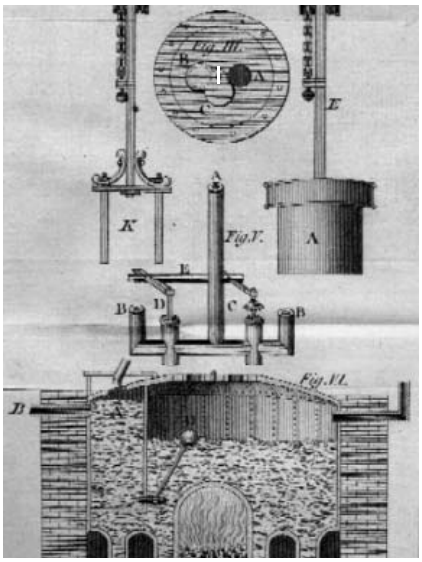
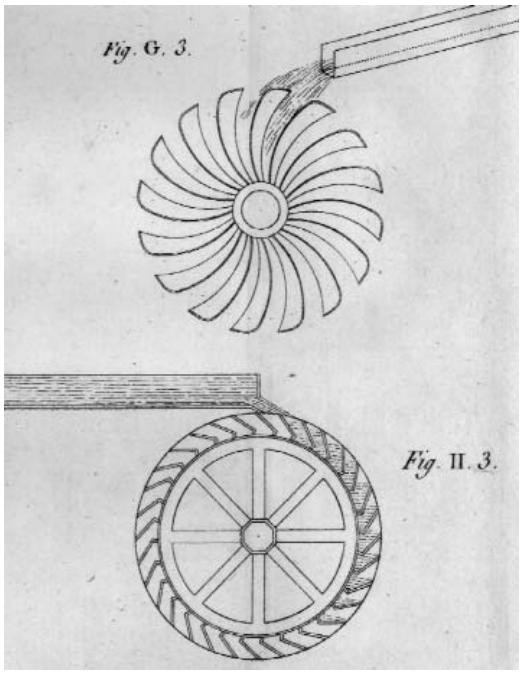


Diagram of parts of Falck's proposed steam engine from his *An account and description of an improved steam engine*..., 1776.

Another engineering purchase was of the dual texts: Jean Nicolas Pierre Hachette's *Programme du cours élémentaire des machines* and Philippe Louis Lanz and Augustin de Bethencourt y Molina's *Essai sur la composition des machines* (Paris, 1808). Hachette occupies an important role in engineering education in the nineteenth century. He taught at the Ecole Polytechnique, the first school that instilled rigorous mathematical training for engineers. The first course on basic machines was developed at the school by Hachette's teacher, Gaspard Monge. The Dibner Library has the books that came out of Monge's course, the *Géométrie descriptive* (1798-99) and the *Traité élémentaire de statique* (1794-95) as well as Hachette's revised 1811-12 edition of Monge's geometry text. Hachette's famous course on engineering mechanics was published in 1811 as *Traité élémetaire des machines* (also in the Dibner Library). In between those works, Hachette published a preliminary work that outlined the syllabus of his important course along with an essay by Lanz and Bethencourt that Hachette edited to form a basic text for his students, and that is the work we have just obtained. It fills a gap in our early works on engineering mechanics, and is also nicely supplemented by the Dibner Library's copies of English translations of the Lanz and Bethencourt text published in 1817 and 1820.

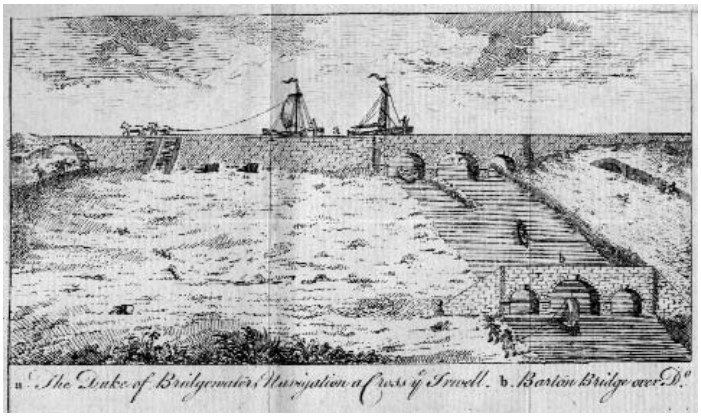


Two water wheels from Hachette's *Programme*..., 1808.

Continued on page 3

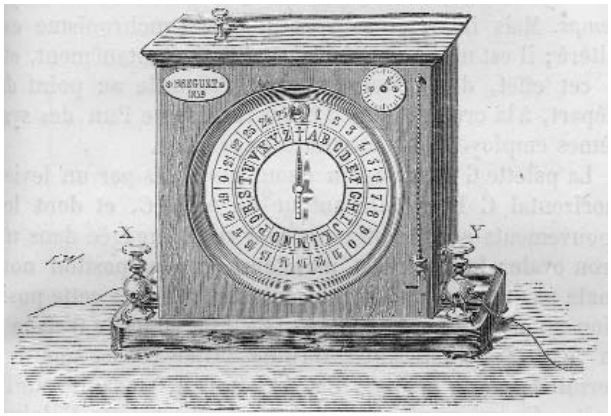
New Acquisitions, continued...

As a nice addition to our collection of works on canals, the Dibner Library has obtained a copy of James Brindley's *The history of inland navigations: particularly that of the Duke of Bridgewater* (London, 1779). This is the third edition of this landmark book in the history of canal engineering. Brindley (1716-1772), a millwright, was hired in 1759 by the Duke of Bridgewater to build a 10-mile canal to haul coal from his mines to the new industrial town of Manchester. Brindley con-



A section of the Bridgewater Canal, from *The history of inland navigations…*, 1779.

vinced the Duke to forego using a system of locks and to go with a gravity-flow canal instead. Brindley's excellent design included both a subterranean channel and an aqueduct and the end result was that the price of coal in Manchester was reduced by one-half! The first edition of this work (1766), the first published account of canals in England, discussed the Bridgewater canal and the many others designed by Brindley, such as the Grand Trunk Canal, that were built following its success. The second edition (1769) added some material on the Trent and Mersey Canal, and this final edition was updated due to the numerous other canals that were built in the interim.



Breguet telegraph receiver that uses a clockwork mechanism to turn the incoming signals into letters and numbers from Mercadier's *Traité élémentaire de télégraphie électrique*, 1880

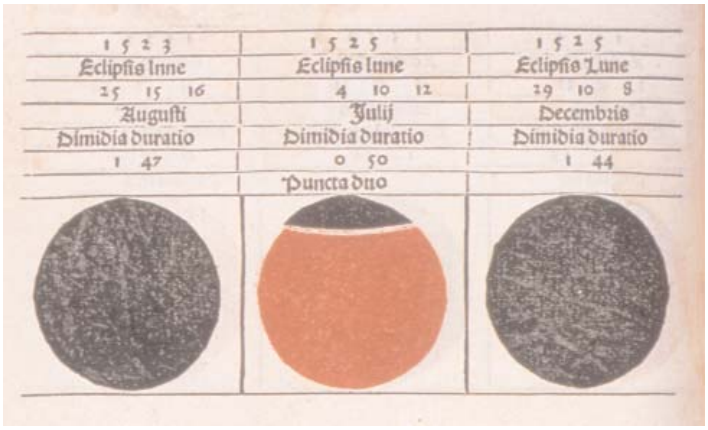
We are always on the lookout for works relating to electrical technology for the Dibner Library as our electromagnetism holdings are the strongest part of the collection. It is hard to find things not in our library that are also affordable, but this fits the bill. It is a first edition of a handbook on electric telegraphy by Ernest Jules Pierre Mercadier, *Traité élémentaire de télégraphie électrique* (Paris, 1880) and it describes the latest developments in electrical storage and instruments with extensive illustrations throughout the book. Mercadier developed electric telegraphs and exhibited his multiplex telegraphic system at the World's Columbian Exposition in Chicago in 1893.

Spotlighting the Dibner Library's Collections: History of Astronomy. Part III.

With the invention of printing by movable type in the 1450s, astronomical texts could be disseminated more widely than before. One of the great astronomers of this period, Johannes Regiomontanus (1436-1476), was also a printer, and he played a valuable role in producing a printed copy of Marcus Manilius's *Astronomicon* in 1473, arguably the first printed book on astronomy. The Dibner Library does not have a copy of this rare first edition, but it does have editions from 1579 (Paris) and 1590 (Heidelberg).

Regiomontanus was a disciple of the Austrian astronomer Georg Peurbach (1423-1461) who was the author of one of the more influential works of the fifteenth century, the *Theoricae novae planetarum*. Peurbach's straightforward treatment of an earlier thirteenth-century textbook on astronomy became a wild best-seller and went through dozens of editions after its first printing by Regiomontanus around 1474. Editions of 1495, 1534 (both Venice), 1515, 1534, 1557, 1558 (Paris), 1569, and 1596 (both Basel), can all be found in the Dibner Library's collections.

Regiomontanus also became well-known for his production of a set of ephemerides, or tables pointing out the locations of the Sun,



Regiomontanus (1436-1476). *Kalendarium.* Augsberg, 1499.

Moon, and planets for each day from 1475 to 1506. This work, known as the *Kalendarium*, was popular among astronomers and went through many printings. As 1506 neared, other astronomers extended the *Kalendarium* well into the sixteenth century. In the Dibner Library you will be able to find editions of 1476, 1483, 1498, 1507 (all Venice), 1499, and 1512 (both Augsburg).

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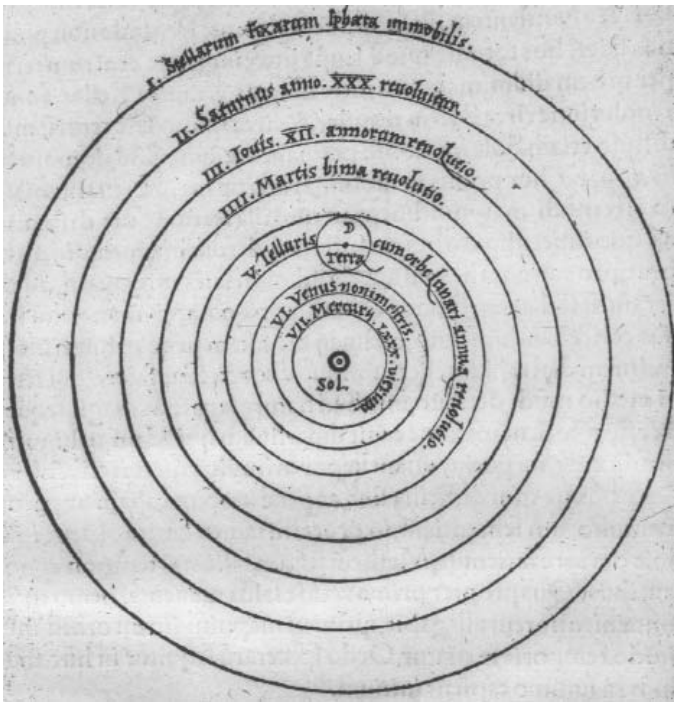
Unfortunately, Regiomontanus's printing and astronomical careers came to an untimely end when he died during a visit to Rome to assist on a project for calendar reform. His early death put a hold on the great project he had been working on with his mentor, Peurbach, a systematic abridgement of the great ancient treatise on mathematical astronomy, Ptolemy's *Almagest*. The abridgement finally saw the light of day in 1496. At half the length of the original and incredibly easier to understand, the *Epitome*, as it became known, had an immediate impact on the development of astronomy in the sixteenth century.

In 1503, Nicolaus Copernicus returned to his native Poland after spending time studying canon law and medicine in Italy. While in Italy Copernicus developed a keen interest in astronomy and quite a dissatisfaction with the current models of the solar system that had been passed down from Ptolemy. Copernicus took up an administrative post at Frombork cathedral and continued to study astronomy when he wasn't helping to fight off the marauding Teutonic Knights that were a constant threat. He began developing a new planetary model that was based on a Sun-centered system and even circulated the idea among some colleagues, but he was not prepared to publish his ideas. In 1539, Georg Joachim Rhäticus, a mathematics teacher at Wittenberg came to visit Copernicus and their time together resulted in Rhäticus publishing a short treatise called the *Narratio prima* (First Report) that was the first printed mention of Copernicus's ideas.

The first edition of the *Narratio prima* was printed in Gdansk in 1540 and is now extremely rare. Owen Gingerich printed a preliminary census of the copies of the 1540 edition as an appendix in his 2002 census of copies of *De revolutionibus* and listed 24 known copies of the work. There are only four copies in the United States and none in the United Kingdom, Australia, Asia, or Africa. We are privileged to have a copy of this seminal book in the Dibner Library. If you want to find the record of this book in our online catalog, SIRIS, at www.siris.si.edu, please note that searching by the commonly used form of his name, "Rheticus," will not locate the record; you need to enter "Rhaticus." The mild reception (mild in the sense that no one called this radical theory a heresy; it was popular enough among astronomers to warrant a reprinting in 1541) encouraged Copernicus to publish the full theory in his landmark work of 1543, *De revolutionibus orbium coelestium* (On the Revolutions of the Heavenly Spheres).

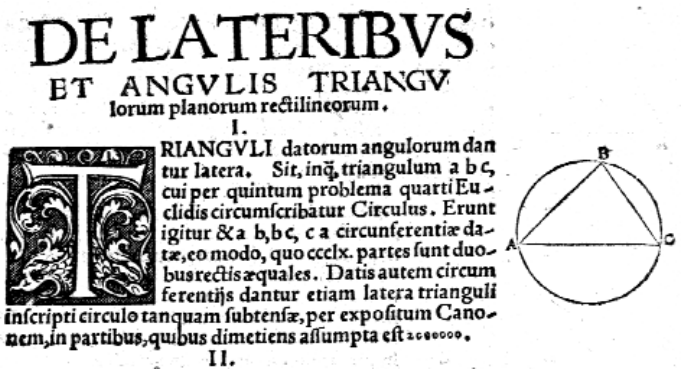
One of the greatest books in the history of Western intellectual thought, Copernicus's *De revolutionibus* was printed just weeks before the author's death at age seventy. In the first section of the work, Copernicus outlined his radical vision with the Sun at the center of the cosmos and the Earth as one of the planets orbiting the Sun. The system put forth by Copernicus makes sense to us today, but in 1543 it was trying to overcome thousands of years of long-established belief in an Earth-centered universe. Copernicus had to offer compelling proof for his model to change people's minds quickly and this he could not do. But in the remaining sections of the work, Copernicus justified his ideas by showing how the intricate mathematical structure he espoused could provide better predictions of planetary positions. The complexity of the book and the rigors of its mathematics kept all but the most adept



Nicolaus Copernicus (1473-1543). *De revolutionibus orbium coelestium.* Nuremberg, 1543.

astronomers from appreciating its benefits. The revolution in astronomy that this book caused would have to wait for the next century to burst forth, but the seed had been sown. The Dibner Library has the 1543 Nuremberg edition, but not the second edition (from Basel) of 1566 (this copy remained at the Burndy Library). A later but much changed edition of 1617 from Amsterdam, with the new title *Astronomia instaurata*, is also in our collection. The printing history of *De revolutionibus* is told in detail by Owen Gingerich in his book, *An Annotated Census of Copernicus'* De revolutionibus *(Nuremberg, 1543 and Basel, 1566)*, Leiden, 2002.

Finally, we are also proud to have in the Dibner Library a copy of the rare 1542 work by Copernicus, *De lateribus et angulis triangulorum*. This book consists of the trigonometric section from the first part of *De revolutionibus* and was printed one year prior to the main work by Rhäticus for the use of his students at Wittenberg. There are seven libraries in the United States that are known to have copies of both *De revolutionibus* and *De lateribus*.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Nicolaus Copernicus (1473-1543). *De lateribus et angulis triangulorum.* Wittenberg, 1542.

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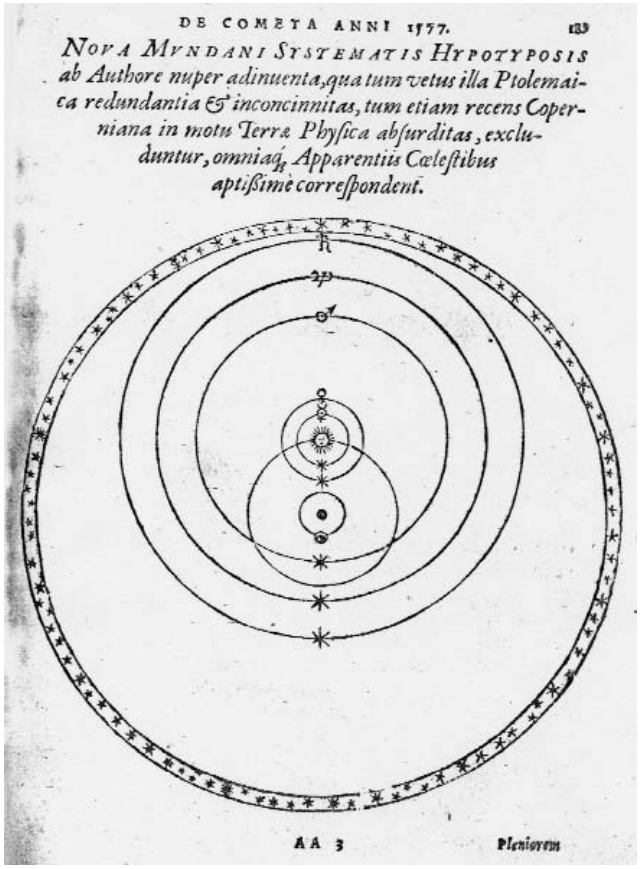
Bibliographical Note: The Fall 2002 issue of* Dibner Library News *was not published separately and is included as part of this joint issue for Fall 2002 and Spring 2003.

The acceptance of Copernicus' sun-centered theory of the universe required a better understanding of the universe and the forces that cause the planets to move. One of the first astronomers to have a major impact after Copernicus was Tycho Brahe. Tycho (like Galileo, Tycho is usually referred to by his first name) was born to a noble Danish family in 1546 but escaped his feudal career path by being raised by his academically-inclined uncle Jørgen. His early interest in astronomy was encouraged and his early observations convinced him that the current planetary tables were way off and astronomy needed a more solid foundation of accurate observations upon which to build. And he was just the guy to do it!

To begin his reformation of astronomy, Tycho needed an observatory and have it stocked with the finest instruments, but he had neither. That did not stop him from observing with what was available and in 1572 he made some observations of the brilliant nova ("new star") that appeared in Cassiopeia. His measurements indicated that the nova was too far away to be an atmospheric phenomenon, as many believed, and so therefore must be a part of the supposedly "unchanging and immutable" heavens. His work impressed King Frederick II and Tycho was granted the island of Hven in the Danish Straits. Here Tycho established his observatories Uraniborg (Castle of the Heavens) and Stjerneborg (Castle of the Stars) and had such fine instruments made for it that it was without doubt the leading observatory complex in Europe from 1580 to 1597.

Tycho knew that to have any lasting impact on astronomy he would have to publish his observations and findings. He was not terribly pleased with the printer who published his first book (on the 1572 nova), *De nova stella* (The New Star; Copenhagen, 1573; not in the Dibner Library, alas) and so he set up a printing press at Uraniborg that would allow him to be in control of his published output. In 1577 a bright comet appeared and Tycho painstakingly observed its motions so that he could use this to bolster his cosmological theory. As he worked on his book about the comet, Tycho thought about how the solar system had to be constructed to allow for his theories. Even though Copernicus's theory had many advantages, Tycho preferred to stay with the traditional physical notion of having the Earth at the center of the universe. The new Tychonic universe had the Earth at the center and the Sun and Moon orbiting the Earth but with the new wrinkle of having all the other planets orbiting the Sun. Rather than stop working on his long-overdue book about the comet, Tycho added in a few chapters about his cosmological model and printed off his first book from his very own press, *De mundi aetherei recentioribus phaenomenis* (On the Recent Phenomenon in the Heavens; Uraniborg, 1588). The Dibner Library's copy is in a contemporary vellum binding. Unfortunately, someone had earlier removed a smaller work that was bound with the Brahe book, so the gap has been filled with blank acid-free sheets. Still, it is in excellent condition just as when Bern Dibner purchased it from Branner's in Copenhagen in 1974.



Tycho's theory of the arrangement of the solar system from his 1588 *De mundi…*

Apart from his astronomical treatises, Tycho also planned to publish his astronomical correspondence. This project lagged because of a shortage of paper, so in 1590 Tycho started building a paper mill on Hven to assure him an ample supply of sheets for the many books he wanted to produce. His plan was to publish his letters chronologically in several volumes, but with the death of the esteemed astronomer Wilhelm, Landgrave of Hesse, Tycho decide to publish his extensive correspondence with the Landgrave and his mathematician, Christoph Rothmann, as a tribute. By 1596 Tycho had his paper stock in hand and printed his correspondence with the Landgrave and Rothmann as *Epistolarum astronomicarum libri* (Book of Astronomical Letters; Uraniborg, 1596). Brahe printed around 1,500 copies (his usual print run) and distributed a few of them as presentation copies. Most of the copies were not issued, however, and the remainder was obtained by the Nuremberg printer Hulsius who reissued the sheets in 1602 with a new title page and the first gathering reset. The remaining stock was later obtained from Hulsius by the Frankfurt printer Tampachius who reissued the sheets again in 1610 but with a different title page. Bern Dibner listed this work as his *Herald of Science* number 4, in part because of his belief that his copy was Tycho's personal copy. Today we are convinced that the Dibner Library copy is,

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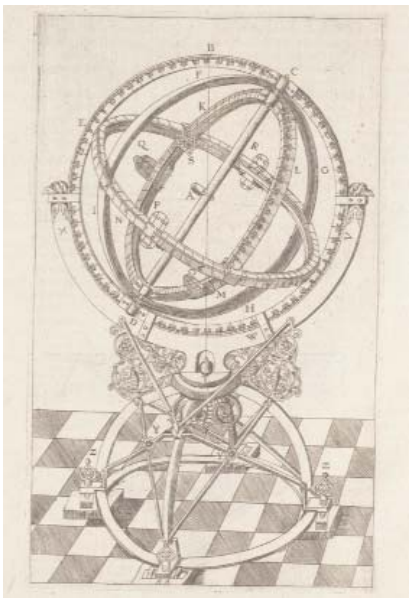
History of Astronomy. Part III, continued…

like most of the other known copies, a presentation copy with Tycho's image stamped in gold on the cover and a hand-colored portrait of Tycho tipped in at the front. Tycho never got around to publishing any further volumes of his correspon-

Cover of the Dibner Library's copy of Tycho's 1596 *Epistolarum...* with Tycho's image stamped on the center.

dence.Tycho's plans to reform astronomy were dealt a sharp blow in his deteriorating relationship with the new Danish king, Christian IV. Christian withdrew his support from Tycho and the latter decided that his only chance to continue his work would be in exile. Tycho left Denmark in 1597 and by the following year had taken up residence in a castle near Hamburg. At this time he began publication of a work that would illustrate the superiority of his astronomical instruments and that he was capable of making great discoveries with them. Even though he was planning to publish such a book for some time, he now knew that it would prove crucial to his finding support from a new patron. He arranged with a nearby printer to use his printing press (Tycho had taken this with him when he left Hven) and produce around 100 copies. Work went quickly and in 1598 his *Astronomiae instauratae mechanica* (Instruments for the Reformation of Astronomy) appeared as a folio dedicated to the Holy Roman Emperor, Rudolf II, with twenty-two illustrations of his instruments. Tycho distributed the copies to influential and powerful peo-



One of Tycho's astronomical instruments, an armillary sphere, from his 1602 *Mechanica...*

ple and his endeavor paid off as well as he could imagine. Rudolf was greatly impressed by the *Mechanica* (and its dedication, no doubt) and summoned Tycho to come to Prague as his court astronomer. While the Dibner Library does not have a copy of this rare first edition, we do have the first edition printed for sale, in 1602 by Hulsius, who had obtained the engravings and woodcuts from Tycho's heirs. This copy has been completely digitized and is available online at www.sil.si.edu/DigitalCollections/HST/Brahe/brahe.htm.

Back in the mid-1580s, as Tycho was putting together *De mundi…*, he realized that he needed to publish a more detailed work on the 1572 nova and his observations of it. As he worked on this new book he started moving toward an entirely new plan of publishing a much larger multi-volume work that would include the two books on the nova and the 1577 comet (*De mundi…*) as well as a general description of his solar and stellar research and theories. For this new comprehensive work, Tycho chose the title, *Astronomiae instauratae progymnasmata* (Introductory Exercises Toward a Restored Astronomy). According to his plan, the first published portion of the *Progymnasmata* would be the 1588 *De mundi* (on the 1577 comet, discussed earlier in this article). But because it lacked the necessary introductory material, he decided that it would actually be the second volume of the *Progymnasmata* and he printed it with the words "Liber Secundus" (Book 2) on the title page. In the meantime he continued to work on Book 1 of the larger work and even printed most of the 800-plus pages for the planned print run of 1,500 copies on his printing press, but he was unable to complete the book by the time he had to leave Denmark in 1597. The pages for the unfinished Book 1 were stored at a warehouse in Magdeburg while Tycho wandered in exile. When Tycho settled in Prague, he started thinking about finishing Book 1 and publishing it, but his sudden death in 1601 ended his plans. Shortly thereafter, his assistant Longomontanus completed the details of Tycho's lunar theory. Johannes Kepler composed the preface and conclusion, so Book 1 of the *Progymnasmata* was finally published in Prague in 1602. The title page of Book 1 called it the "Prima Pars," or First Part, of the *Progymnasmata*. Only a few copies were issued of this work, however, and the sheets for both books found their way to our old friend Tampachius in Frankfurt who issued both volumes of the *Progymnasmata* in 1610.

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History of Astronomy. Part III, continued...

Book 2 of the 1610 issue not only contained the *De mundi*, but also the *Epistolarum* (mentioned above). The Dibner Library has copies of the 1602 Book 1 and both volumes of the 1610 issue. The 1602 volume is bound in vellum and unfortunately no longer has its title page (it is replaced by one in facsimile). There are some markings in the book, but not enough to determine who owned the book. Our 1610 2-volume *Progymnasmata* is bound in blind-stamped leather. The books were once owned by the Rev. Francis Wollaston (1731-1815), an avid astronomer and author of the well-known work, *A portraiture of the heavens, as they appear to the naked eye* (London, 1811).

Engraving of Tycho Brahe after a portrait by Jacob de Gheyn (1565-1629).

Before leaving Tycho, I should note that the Dibner Library has a number of other items of interest related to him. Among these is a brief handwritten note signed by Tycho himself and dated July 20, 1590 (our MSS 163A). Another interesting item is the manuscript for most of the edition of Tycho's *Opera omnia* (complete works) by John Louis Emil Dreyer (1852-1926). Dreyer was a Danish astronomer who settled in Ireland and Northern Ireland, working at Lord Rosse's private observatory and Dunsink Observatory in Dublin before becoming Director of Armagh Observatory in 1882. The manuscript of his edition of Tycho's complete works is contained in three large boxes and composed in either Latin, English, German, or Danish. The bulk of the manuscript (our call number MSS 249B) is for the volumes of Tycho's observations (vols. 10-13) with the remainder being mostly Dreyer's notes and/or introductions to the other volumes of Tycho's printed works. A more detailed list of the contents of this collection is available upon request from the Dibner Library. Dreyer worked on the Tycho *Opera* mostly after he retired and moved to Oxford in 1916; the set consisted of fourteen volumes and one index volume and was published between 1913 and 1929 in Copenhagen. After his death in 1926, Dreyer's extensive library was sold by the London bookseller Henry Sotheran in his catalogue 804. The Dibner Library currently has fourteen volumes that were once owned by Dreyer, including his annotated copy of Antonio Favaro's *Carteggio inedito di Ticone Brahe, Giovanni Keplero… con Giovanni Antonio Magini* (Unpublished Correspondence of Tycho Brahe, Johannes Kepler [and others] with Giovanni Antonio Magini, Bologna, 1886).

To be continued in a future issue...

Ronald Brashear

Dibner Library Resident Scholars for 2003

Dr. Helen Hattab is Assistant Professor of Philosophy at The University of Houston. The title of her research program at the Dibner Library is "Causes, Laws, and Mechanics: Connections Between Renaissance Mechanics and the Mechanical Philosophy." This research is part of her book-length project that will place Descartes' modern view of causation and scientific explanation in its intellectual context and reassess its historical and philosophical significance. She will be using many of the Library's sixteenth- and seventeenth-century works on mechanics.

Dr. Michael Schiffer is Professor of Anthropology and Director of the Laboratory of Traditional Technology at the University of Arizona. At the Dibner Library he is working on a research project titled "Electrical Science from Volta to Edison." Dr. Schiffer intends to use works in the collection by authors such as Ampère, Davy, Ørsted, Faraday, Arago, Biot, de la Rive, and Maxwell to look at the changing application of electrical technology after the advent of Volta's battery and Ørsted's discovery of electromagnetism.

Dr. James Day is Associate Professor of Physics in the Division of Natural Sciences at Transylvania University in Lexington, Kentucky as well as Curator of the Moosnick Science Museum at Transylvania, a large collection of scientific and medical nineteenth-century teaching apparatus. Dr. Day used the Dibner Library collections to research the museum's scientific instruments. Instrument descriptions in the Dibner Library by firms such as Bland & Long, Brown & Pierce, E. M. Clarke, Daniel Davis, Jr., W. and S. Jones, and Pixii provided important information on the instruments themselves.

Dr. Gildo Magalhães dos Santos, filho, is Professor of History of Science and Technology in the History Department of the University of São Paulo, Brazil. His research project at the Dibner Library was "Electromagnetism and Natural Philosophy in the Early Nineteenth-Century." The marvelous collection of works on electricity provided a fertile ground for Dr. Santos's research and he looked at a number of titles and manuscripts by Ampère, Arago, Fresnel, Gauss, Kirchhoff, Ørsted, and many others.

FONTANA MACHINE HIGHLIGHTS GRAFTON LECTURE

On October 15th, Anthony Grafton (Dodge Professor of History at Princeton University, and winner of the prestigious Balzan Prize in History of the Humanities) presented the 2002 Dibner Library Lecture, "Technica Curiosa: Engineering and Magic in Early Modern Europe." He spoke eloquently on natural and artificial magic, especially the work of the 17th-century Jesuit Gaspar Schott and 15th-century engineer Giovanni Fontana.

The lecture featured many illustrations from works in the Dibner Library, including Schott's natural machine, a water-spewing lobster.

Gaspar Schott (1608-1666). *Mechanica hydraulico-pneumatica...,* Frankfurt, 1657.

To top it all off was the appearance of Fay, a scale model of one of Fontana's machines put together by Tony's wife, Louise, a production designer for a theater in Philadelphia. Using only the description in Fontana's manuscript, Louise fashioned a working model of a half-woman, half-demon machine and even placed fireworks in Fay's mouth and hands to add to the chilling effect.

Thanks to everyone who attended; we hope to see more of you here for the 2003 Lecture (see page 1 for details). The 2002 Lecture will soon be available in print and online.

Be sure to visit the Dibner Library's website:
www.sil.si.edu/Libraries/Dibner/index.htm

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