Madison County Historical Society

MCHS News

September 2013 | Opening Doors to Madison County History | Vol. 1, No. 5

715 N Main Street
Edwardsville, IL
62025

Hours:
Wed-Fri 9 am - 4 pm
Sunday 1 pm - 4 pm
Group Tours Available

Free Admission

Museum Phone:
618-656-7562
Library Phone:
618-656-7569

Web Address:
MadCoHistory.org

E-mail:
info@MadCoHistory.org

About Us:

The MCHS museum complex consisting of a modern archival library, the 1836 Weir House Museum and the Helms Collection Center, is owned and operated by the non-profit Madison County Historical Society with assistance from Madison County.

The Madison County Historical Society is a 501(c)(3) charitable organization.

The Madison County Historical Society Presents -

A History of Surveying

This extended issue of the *MCHS News* will focus on the importance of surveying and the history of the tools used by the trade. There are several articles, beginning on page six, that are coordinated with a September MCHS exhibit and a community program in October.

Surveyor Jeffrey Pauk will be the featured speaker on Sunday, October 6 at 2 p.m. at the Madison County Historical Society Archival Library where he will discuss the history of surveying. The program compliments a new exhibit on surveying and surveying instruments that opens September 15 at the Madison County Historical Society Museum. Pauk will provide a brief history of surveying, including how methods and applications influenced the history of Madison County. Following his prepared remarks there will be an open forum when Pauk will take questions from the audience about surveying or unfamiliar terms found in property abstracts.

An entertaining and informative speaker, Pauk has been researching the history of Madison County surveying for many years. He is the proprietor of Madison County Surveying, a second generation business located in Edwardsville.

"Tools of the Trade: Surveyors and Topographers" is an exhibit of surveying instruments from the museum's collection supplemented by instruments on loan from a private collector. The exhibit was curated by MCHS President and SIUE Emeritus Associate Professor Gary Denue. "Tools of the Trade" will run through mid-February, 2014.

Fall Calendar

Beginning September 15
MCHS Museum
Exhibit: Tools of the Trade:
Surveyors and Topographers

Sunday, October 6, 2 p.m.
MCHS Archival Library
History of Surveying in Madison County
with Surveyor Jeff Pauk

Sunday, November 3, 5:30 p.m.
Dining in History
Dinner at the Wildey Theatre
featuring Wildey Historian Joan Evers

November 1- December 1
MCHS Friends Wreath Silent Auction
MCHS Museum and Archival Library

Sunday, December 1, 1-4 p.m.
Holiday Open House
MCHS Museum & Archival Library

MCHS Goes to Market

On Saturday, August 3, MCHS went to market...the Land of Goshen Market in Edwardsville. The Society will have a regular booth on the first Saturday of the month for the remainder of the season. Research Manager Mary Westerhold (above) will welcome your history questions!

Archival Library Spotlight

By Mary Westerhold, Archival Research Manager

The Archival Library was a recent recipient of a large collection of research material from Don Hastings, Jr. The collection consists of several boxes of information relating to the Lewis and Clark Expedition. While that sentence seems a simple summation of a donation, the true value of the collection results from the donor.

Don Hastings, Jr., had just turned 61 when he passed away on June 1 of this year. Many of those 61 years were spent in historical research, with the Lewis and Clark Expedition being a major passion of his and his area of expertise. Even though I have only briefly scanned the donation during the initial process of cataloging and housing it, I can easily verify the work and passion that is contained in the boxes. The scope of the research is amazing. Don's research material does not stop with just a general story of the expedition, but includes material on the members of the expedition and their families, the various locations the expedition visited, the

Library continued on page 12

Museum Spotlight

By Jenn Walta, Curator

Edwardsville's A & W Root Beer

Midwest summers can be torturous, but in the past Edwardsville residents could beat the heat with a frosty mug of cold A & W Root Beer. For nearly half a century, (1954 - 2000) the A & W franchise restaurant stood at the corner of Myrtle and St. Louis Streets in Edwardsville. It was a popular stop for high school students as well as travelers along old US Route 66. The location was previously the headquarters of Orville West's "Popcorn Wagon," and before that the site of a grand two-story residence that was the home of A.O. French.

A & W Menu donated to MCHS by Mike and Carol Sporrer.

Mel Kaufmann, his wife, Vonney, and their five children opened the Edwardsville institution after moving from Marshfield, Wisconsin. In its first year of operation, a mug of the frosty concoction cost just five cents. The first few years were rough, but business soon picked up.

Dennis Kaufman returned from the navy in 1961. The following year, he married his high school sweetheart, Carol Brethorst, and they purchased the operation from his parents. Carol managed the business by herself after Dennis was killed in a 1977 automobile accident.

Edwardsville's A&W went to the movies in 1977 when a scene from the film "Stingray" was filmed at the restaurant.

On April 3, 1981, an F-4 tornado struck Edwardsville's downtown business district, including A & W's building and sign. Trash cans were thrown through the large plate glass windows, but there were no serious injuries. Fortunately the small building had a basement where employees took shelter.

In 1990, Art and Sandy McNeil, Dennis's step-sister and her husband, purchased the franchise from Carol and her second husband, Mike Sporrer. The McNeils ran the business until the restaurant closed in 2000. The building was razed the following year and the site is now a parking lot..

MCHS cares for a number of A & W artifacts including a napkin dispenser, plastic cup, and a menu board. There are also six mugs with logos from various time periods. Museum visitors are encouraged to stop by and share their memories of the drive-in.

News In Brief

The August MCHS program on the Edwards Trace was postponed due to a sudden illness in the presenter's family. The topic was a popular one, so we hope to have him back at another time.

Cindy Reinhardt provided a substitute program on "150 Years of Hometown News" as recorded in the pages of the Edwardsville Intelligencer. A book of the same title by Reinhardt was published last December and is available at the MCHS gift shop.

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The counter case containing maps and library cards has been expanded to include bound newspaper and additional map cases. The entire case makes a handsome, practical addition to the archival library.

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The Kane Collection exhibit has been postponed until March to allow a longer window of opportunity for those interested in the Survey Exhibit that opens Sunday, September 15th.

◆

Installation of decorative lighting on the MCHS plaza to match Edwardsville's new street lights on the historic north end of Main Street should be completed by October. Burial of electrical lines to the museum complex is also part of this project.

◆

An SIUE intern, Ryan Anderson, will be working with Curator Jenn Walta this fall. Anderson, a native of Collinsville, is a senior anthropology major who will work about 9 hours per week for the Society. His work for MCHS will include cataloging donated items and curating an exhibit of Indian artifacts from the MCHS collections.

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Additional volunteers are needed for the probate records project. The work is done on Thursday mornings beginning at 9 a.m. in the Archival Library. Call 656-7569 or stop by for additional information on serving as a volunteer for this interesting project.

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New Bookcases

Dr. Collins Encourages Bookcase Fund Donations

Dr. Janet Duthie Collins and her late husband, Dr. Lloyd Collins, have been loyal supporters of the Madison County Historical Society for many years, and she is now encouraging others to follow her lead. Dr. Collins has initiated a MCHS Bookcase Fund to pay for Phase Two of the Bookcase Project. When completed, the new cases will allow MCHS to have more publications accessible to the public for browsing.

Memorials for her husband funded upper cases on the east and west walls of the library. Custom built by Steve Stolte, the new cases match those already in place on the north wall. The estimated cost to install bookcases along the south wall of the library and complete Phase Two of the project is $7,000.

Dr. Collins has recognized the need and pledged $25 per month until the needed funds are raised. She invites others to join her in raising funds for this worthwhile endeavor.

Newly installed bookcases at MCHS are ready to be filled with materials from MCHS Archival Library collections.

MCHS: Another Year of Progress

Membership Levels

$15
Student

$35
Individual

$50
Family

$100
James Madison

$250
Edward Coles

$500
Elijah Lovejoy

$1,000
John Weir

Benefits of Membership

- Six issues of the MCHS newsletter
- Access to *Time Travelers,* a reciprocal membership network of over 200 historic sites and museums.
- Invitations to receptions and special programs throughout the year.
- 10% discount at the MCHS gift shop and to MCHS events.
- The opportunity to network with others who value the past as much as you do.
- The satisfaction of contributing to the preservation of our county's history.

Call 618-656-7562 for more information.

The Madison County Historical Society believed in "Opening Doors to Madison County History," nearly 100 years before making those words its new Mission Statement.

Many activities and events during the past year have allowed MCHS to open those doors to more people. Through 2013 newsletters, members of MCHS have learned about historic theater buildings of Madison County, been fascinated with Charlotte Johnson's article on the Underground Railroad, and read Route 66 Author Cheryl Eichar Jett's history of our piece of America's Mother Road.

The July newsletter featured the fascinating history of Madison County summer resorts during the last century, and, in this issue, an interesting history of surveying will entertain you. In the year's final issue, you will learn about Madison County's "Famous, But Forgotten."

We hope you will join members and friends on November 3 for what will be the first of many "Dining in History" events, where we will tour and learn the history of a historic place in Madison County and enjoy a delicious meal. For the inaugural year, the venue is the historic Wildey Theatre in Edwardsville. You'll also want to mark your calendar for December 1 for our annual Holiday Open House and Wreath Silent Auction, hosted by the Friends of the Madison County Historical Museum.

This year, MCHS has presented programs about Fort Russell, the History of the Edwardsville Intelligencer and, coming on October 6, the History of Surveying. In addition, the Museum sponsored a display of historic surveying instruments and an exhibit about Alton's abolitionist newsman and martyr, Elijah P. Lovejoy.

Mary T. Westerhold, Archival Library Research Manager, authored a pictorial history of Madison County from the photographic collection of MCHS; she also hosted a delightful program and book signing in June.

We are pleased to report that thousands of area photographs have been scanned and added to the collections in the past year. Some of you helped identify people in photographs from the Dick Norrish Collection at our "Tube Sock Palooza" event. In addition, many artifacts, books and other memorabilia tracing the history of Madison County have been added to the collection.

In the past year, the MCHS Museum and Archival Library saw thousands of visitors, who came to research their families or homes, attend programs or enjoy a tour. All were assisted by a welcoming staff and our wonderful MCHS volunteers. No one was charged for admission or services.

The Madison County Historical Society will continue to work hard to provide more exhibits and programming for 2014 – some of which are already in the planning stages.

We need your help to continue this important work. We hope you will renew your annual membership by returning the application that will be enclosed in your November newsletter. Your gift helps us maintain and expand our collections, artifacts, and buildings as well as provide programs and exhibits. *Your gift ensures that Madison County's history will be preserved for future generations*.

The benefits of MCHS membership are listed in the column on the left side of this page. If you are thinking about joining MCHS for the first time, you can sign up now to receive 15 months of benefits, beginning Oct 1, 2013 and running through Dec 31, 2014. We hope you will consider becoming a member of the society or giving gifts of MCHS memberships to friends and family. For more information, please call 618-656-7562 or go to www.MadCoHistory.org for an application.

DINING IN History

Opening Doors to Madison County History

Sunday, Nov 3 5:30 pm

Wildey Theatre
The Marquee Room

252 North Main Street
Edwardsville, Illinois 62025

Tickets
$22 Members
$25 Non-Members

This "Dining in History" event is the first of what MCHS hopes will become an annual event featuring historic venues all over Madison County.

Madison County Historical Society

For more information
MCHSnews.org
618-656-7569 (Wed - Fri 9-4)
618-656-1073 (After hours)

Last date for reservations
Sunday, October, 27, 2013.

Program

Wildey Theatre Historian Joan Evers will tell stories of the history of the Wildey including her personal recollections. As the daughter and niece of the early Wildey projectionists, Evers grew up in the Wildey and heard many stories of the beginning years of film at the historic theater. The program includes a tour of the theater.

Evening Meal

Mixed Green Salad
with tomatoes, shaved parmesan & toast onion tossed with a Vidalia onion balsamic vinegarette

Grilled Chicken Breast
served with a creamy tarragon sauce

Grilled Marinated Pork Tenderloin
with your choice of honey orange chutney or sour cream horseradish sauce

Fresh Snap Beans
tossed in herbed olive oil

Roasted Red Potatoes
with rosemary tossed in light olive oil

Hawaiian Dinner Rolls

Cake

Coffee Or Tea

Wine Or Beer (Cash Bar)

Benaiah Robinson

Pioneer Surveyor

By Jeff Pauk

Professional Life

Benaiah Robinson was one of the more influential County Surveyors of Madison County in its early development. He was appointed to the position from 1820 to 1825 and was elected from 1835 to 1853. He held the position longer than any other surveyor. In addition to this post, he was elected as a delegate to the 2nd Constitutional Convention to the State of Illinois in 1847.

Personal Life

Benaiah Robinson was born on March 11, 1796 in Lincoln County, NC at a location about 10 miles Southeast of the Battle of King's Mountain. He was the son of Mary and John Robinson. John, it is believed, was a veteran of the North Carolina Continental Army during the Revolutionary War. He had an older brother also named John and two younger brothers named James and Gedien. Based upon probate information, it appears he also had two sisters named Margaret and Eliza.

The family moved to Illinois in the early 1800's, arriving first at Kaskaskia and later settling in what would

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Surveying and Surveying Instruments

The Golden Age: 1800-1900

By Gary Denue

With the end of the Revolutionary War and the establishment of the United States, both the federal and state governments were involved in paying off their debts from the war through the sale of land to settlers. Several of the states had land gained from English Charter grants. Most notably Virginia, Connecticut, Massachusetts and Georgia had charters that had extended their borders to the Mississippi River. During the period 1782 to 1802, all of the original 13 colonies ceded their land beyond their present boundaries back to the Federal Government. A large portion of this land north of the Ohio River and east to the Mississippi River was known as the Northwest Territory. It totaled over 260 million acres.

In 1803, the United States purchased the Louisiana Territory totaling over 524 million acres. Between 1804 and 1868, the United States added 1,180 million acres of land through the various annexations, treaties and purchases including Alaska in 1868. This exponential growth of the United States established a need for surveyors and topographers as well as reliable surveying instruments to enable settlement and cultivation of this enormous resource.

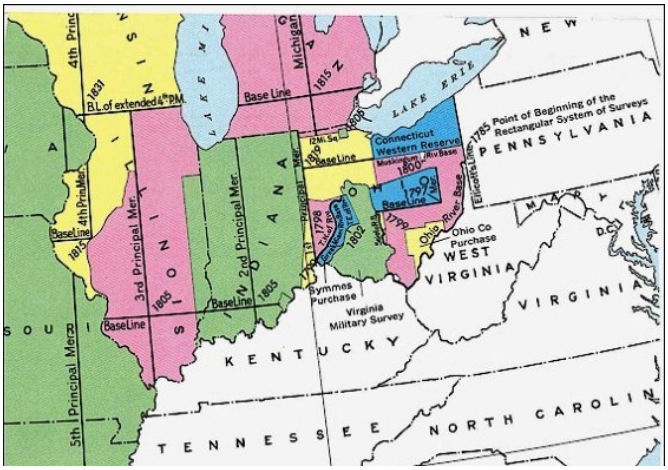

Figure 1. Northwest Territory (Bureau of Land Management, 1968)

The ceding of land by the original 13 colonies resulted in a number of land ordinance acts between 1785 and 1805. The Ordinance of 1785 set a system for surveying and the Northwest Ordinance of 1787 set up a system for insuring legal regularity for the sale of land in the Northwest Territory. The surveying system set up in the Ordinance of 1785 is commonly known as the Rectangular Survey system. The Ordinance established a coordinate system for locating townships based on the intersection of a north-south meridian and an east-west base line. It provided for the creation of townships of six miles square and when necessary, fractional townships. Each township comprised 36 sections, each section having an area of one square mile or 640 acres. The law also required the appointment of surveyors to draw plats of land surveyed as well as gave the Federal government the power to sell land located in the territory. The Rectangular Survey system would be used to survey all public lands in the United States with the exception of Kentucky, Tennessee and Texas.

The Rectangular Survey system was totally different than the system of metes and bounds used in the original 13 states. "Metes" refers to a boundary defined by the measurement of each straight run, specified by a distance between the terminal points, and an orientation or direction. "Bounds" refers to a more general boundary description, such as a stream, a stone wall, a tree, a road or a building. The resulting surveys in metes and bounds were often irregular shapes with complex descriptions. However this system was not suited for large areas in the Northwest Territory where there was no established government to maintain records and property was being sold unseen to investors.

This Ordinance of 1785 resulted in the establishment of the Point of Beginning with a geographer's baseline running to the west from it. (Figure 1.) The surveying of the Seven Ranges in Ohio took place between 1785 and 1789 by a team of thirteen surveyors (only eight showed up) including Thomas Hutchins the Geographer of the United States who died while

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surveying. These ranges were to be the first land sale for the United States. The sales were disappointing, only 72,974 acres were sold for $117,108. The cost to survey the Seven Ranges was almost $15,000. The Congress of the Confederation held no additional land sales. From 1789 until1796 no other rectangular surveys were conducted in Ohio resulting in six other surveying methods being employed.

In the Land Act of May 18, 1796, the position of United States Surveyor General was created operating independently of Congress. With the appointment of a Surveyor General, a set of specific instructions and standards was issued to the deputy surveyors responsible for surveying the new territories which included Ohio, Indiana, and Illinois. The standards specified issues such as description, note taking, setting markers, drawing plat maps for each township, and oaths for both the surveyor and chainman. The instructions also specified what type of equipment was to be used. An early set of instructions by Jared Mansfield, Surveyor General 1803-1813 reads, "The Instrument called a Rittenhouse Compass with a Nonius (vernier to correct the compass for magnetic variation) and a common 2 pole chain of 50 links (will) be used in measuring your line. You will be careful that your chain be compared and adjusted by the standard chain in the Office of the Surveyor General. It will be of importance that your instruments be also occasionally examined when in the Field and corrected or allowances made for variations and errors if any should be found in them." These instructions continued to be updated by each succeeding Surveyor General and the successor government agency the Bureau of Land Management and are still in existence today.

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Instruments and Makers

Surveyors in this time period used two principal instruments to survey – the surveyors compass and the two or four pole Gunter chain. The surveyors compass is an instrument for measuring horizontal angles with reference to magnetic north. It has vertical sights for aiming at distant objects such as the staff used with a chain or a landmark. The compass was mounted on a staff with an iron foot to provide stability and leveling capability. The compass in this format was originally a colonial instrument. Early surveyor's compasses in New England were sometimes made of wood (with a printed paper dial or compass rose) due primarily to the shortage of brass in the colonies and the expense of importing instruments from England. However, instrument making did flourish in the eastern coastal cities, primarily Boston, New York and Philadelphia. The instrument makers were primarily one or two person shops and usually had another trade such as clockmaker or brass founder.

Figure 2. Nonious or vernier compass. (Smithsonian Institution NMAH)

Brass surveyor's compasses came into common manufacture after the Revolution. Until 1780, they had no means of setting magnetic variation on the compass. About 1780 David Rittenhouse made a compass with nonius. A compass with nonius is a compass with a variation arc and a vernier mechanism. (Figure 2.) With it, a surveyor can compensate for magnetic variation, and thus run lines in relation to the meridian. With the addition of the vernier, this became the surveyor's compass and compasses without the vernier became known as plain compasses. Some surveyor's compasses are equipped with an outkeeper, a dial that helps keep track of the number of times the chain has been run out and some have a dial that converts outs to poles. Used

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become Edwardsville in 1809. John Robinson Sr., by 1814 had purchased over 480 acres of land from the Federal Government.

By 1812, Benaiah had learned to read and write well and decided it was time to learn 'figures' (mathematics). He borrowed books from other local settlers and since plank wood was scarce at the time, he procured a piece of walnut from a stump, then smoothed and blackened the surface to craft his own blackboard to practice his work.

By 1817, Benaiah had mastered mathematics, including trigonometry, and had applied for the position of deputy surveyor under Ashael Enloe who was the Madison County Surveyor. By the end of 1817, John Sawyer had been appointed County Surveyor and he hired Benaiah as his assistant. Since Mr. Sawyer had an eye deficiency, Benaiah performed the work in exchange for half of the pay of the County Surveyor. By February of 1821, Benaiah was appointed by the Legislature as County Surveyor.

Among his jobs were the marking of the street right of ways for the

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Robinson
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Original Town of Edwardsville.

He helped found the Edwardsville Library Association and in 1823 was listed as one of the library officers. This was the first public library in the State of Illinois.

Robinson ran for state office in 1822 and 1824, but lost. His father died in 1821 and his brother James in 1825. Probate records seem to show difficulties in finances in the handling of James' estate and that may have been a source for his moving to central Kentucky in 1825. When he returned in 1830, he taught school and wrote a Farmer's Almanac in 1832 and 1833. He married Jane Hoxsey on August 1, 1830.

In 1835, the office of County Surveyor became one elected by the populace of the county, and he won the election by defeating Gershom Flagg. He held the position for four successive terms and was asked to serve a two-year term afterwards.

He ran as a delegate to the Second Constitutional Convention of the State of Illinois in 1847 and was elected with more total votes than that of all of the other candidates combined.

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Surveying and Surveying Instruments

properly the vernier compass was an accurate instrument. Lewis and Clark used one as their principal instrument when exploring the Louisiana Purchase. The map that Clark drew after the expedition from the notes, observations and calculations of Lewis is accurate to within 40 miles over an 8,000 mile journey. The vernier compass remained a staple instrument for surveyors and topographers through the beginning of the 20th century.

David Rittenhouse (1732-1796) is considered the "Dean of Instrument Makers". He was not only a maker of instruments for surveying and astronomy, he was one of

Rittenhouse Compass with nonius 1798-1801 It has a "variation arc on the south arm that extends 15 degrees either way; the "folded" vernier is moved by rack and pinion and reads to 5 minutes." (Smithsonian NMAH)

the most talented surveyors in America at that time. He invented the vernier compass so a surveyor could set the magnetic variation in the field as well as the automatic needle lifter for the compass. He also perfected the use of spider webs for crosshairs in telescopes a technique that would last into the 19th century. The design of his compasses utilized a counterclockwise reading with East to the left of north, a design still utilized today. He was both an innovator and a scientist, succeeding Benjamin Franklin as the President of the American Philosophical Society.

Benjamin Rittenhouse (1740-1825) was David's younger brother and had the same pursuits as David in surveying and astronomy. Although less well known than his brother, his instruments were not only practical, they were works of art. Look at the dial of the instrument pictured at left.

Both brothers created instruments that have historical significance. David made a compass for George Washington in 1782 and Lincoln used a Rittenhouse compass during his time as a surveyor. Benjamin was to create the standard chain for the U.S Surveyor General.

The Act of 1796 specified "all lines shall be plainly marked upon trees with chains containing two perches of sixteen feet and one half each, subdivided into twenty-five equal links and the chain shall be adjusted to a standard to be kept for that purpose" at the Surveyor General's office. David Rittenhouse produced a chain to be used as the standard by the following May. It was a four pole or 66 foot chain with 100 links made of brass. The chain pictured below is a two pole chain.

The chain is the second primary instrument for surveying at this time. There was a standard and in later

2 Pole Surveyor's Chain

"Instructions to Deputy Surveyors", the chainman had to take an oath and provide a second chain as standard. The chain being made of iron was subject fluctuations in temperature as well as stretching during use. The chainman was required to plumb the chain during measurements and set the pins for each start and end of the measurement. The standard chain was a four pole or 66 feet but because of the terrain and natural surroundings being dense the two pole or 33 foot chain was often used. In the Rectangular Survey, the mile was one of the primary measurements and it took 160 two pole chaining sequences to do a mile or 80 four pole chains.

Surveying and Surveying Instruments

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Although the Rittenhouse brothers are considered the premier instrument makers of the 18th and early 19th century, there were over 90 instrument makers working in the United States between 1800 and the 1840's. Names like Breed, Draper, Goldsmith Chandlee, Colton, Julius Hanks, Heisley, John Locke, M.D., Meneely, Pike, Platt, Thaxter, Whitney and Young were prominent in the manufacture of quality instruments during this time.

Thomas Whitney who emigrated from England and settled in Philadelphia around 1800 placed an ad in the1820 issue of Whitely's Annual Advertiser stating that he has made "over 500 surveyor's compasses during the past 13 years". (Smart, p. 166)

Whitney Vernier Compass, 1817
(Smithsonian NMAH)

Whitney, like most other instrument makers of the time, did not depend solely on the sale of instruments for his livelihood. His shop sold cloth, razors, knives and scissors. William J. Young, who became his apprentice in 1813, went on to fame as an instrument maker.

William J. Young finished his apprenticeship with Whitney after 7 years at the age of 20 with $30 to his name. He opened his first shop about 1821. His first order of business was the construction of the dividing engine for accurately dividing and engraving the face of a compass. Earlier instrument makers had used a variety of methods from hand engraving with a divided protractor to use of watch makers engraving machines. The dividing engine had been perfected in England by Jesse Ramsden in 1773 and it allowed for extremely accurate division of the circle without human error into degrees,

The Chandlee Compass
(Smithsonian NMAH)

Colton Surveyors Compass
(Smithsonian NMAH)

Draper Vernier Compass 1835
Featured in MCHS exhibit

In 1853, he packed up his family and headed over the Oregon Trail with his wife and four children. They settled in Benton County, Oregon in October of 1853. He signed an Oath of Allegiance to the U.S. in March of 1865. He died on March 24, 1869. At the time of his death, he owned over 750 Acres in Township 11 South, Range 5 West in Oregon.

Based upon his writings from various sources, he appears to be a well educated man even though he appeared to be mainly self-taught. He owned or developed the majority of the area that is now within the City of Edwardsville and was a business partner with major politicians of the day such as Ninian Edwards and Benjamin Stephenson. He had a repertoire as a surveyor, teacher, author, farmer, businessman, philanthropist, politician, and developer. He may have been one of the most influential people in the early development of Madison County, Illinois.

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Jeff Pauk is a second generation surveyor in Madison County and an MCHS Board Member.

From the MCHS Collection

By Gary Denue

The Nutz/Robinson Surveyor's Compass

The Madison County Historical Society owns a vernier surveyor's compass manufactured by Leonard N. Nutz of St. Louis, Missouri.

Leonard Nutz first appeared in the St. Louis City Directory in 1848 with an occupation as a machinist. In an 1852 listing in the St. Louis City Directory, his occupation is again listed as a machinist located at 10 Second Street. There is a five year gap until the 1857 Directory where Leonard Nutz is listed as a mathematical and philosophical instrument maker whose shop was located at 21 North Washington. After 1857 there are no further listings for Nutz in St. Louis directories.

The compass is 19 inches in length and 8.25

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Surveying and Surveying Instruments

minutes and, in later productions, seconds. To import one to America would have been extremely costly. Young developed one of 24 inches diameter by studying engravings of the English engine. Later he would build a 26 inch and 48 inch diameter engine.

Young also developed a new compass called the Railroad Compass. "Young designed this instrument so that surveyors could measure horizontal angles either with or without reference to magnetic north. Young's patent describes a compass with two plates of nearly equal diameter. The upper plate carries the sights, ring, and needle, as in an ordinary

Dividing engine; Ramsden design. (Smithsonian NMAH)

compass. It also has an opening through which is visible a small portion of the finely graduated circle on the lower plate, and a vernier for subdividing the divisions of that lower circle. The two plates are moved relative to one another by tangent screw, by rack and pinion." (Smithsonian: NMHA: http://amhistory.si.edu/surveying/type.cfm?typeid=14)

Another problem Young tackled and that for which he is most famous is the invention of the transit. While the English had an instrument called the theodolite, it was very delicate and cumbersome to use in the terrain of America. "The chief disadvantage, as of the plain surveying compass, was that the sights or telescope could not revolve completely on the axis, limiting the sightings that could be taken before repositioning the device." (Bedini, pp. 485-486).

Young essentially took his railroad compass and added a telescope between two A-frames over the compass along with a leveling head so the instrument could be leveled easily on a tripod rather than a staff. The transit was an improvement since the telescope could be completely revolved on its axis allowing for back sighting and it could be leveled more precisely. It was also rugged and economical, costing no more than $150.00. Although early models could measure only horizontal angles, later instruments carried an arc on the telescope for vertical angels.

Young also played a significant role in the development of the Burt Solar Compass. William Austin Burt was the Deputy Surveyor for Michigan. While surveying in Wisconsin and Northern Michigan, he noted problems with his standard surveying compass caused by the large deposits of iron ore. To remedy the problem he invented a compass constructed of brass with a solar attachment that allows surveyors to determine

Above is a William Young transit from 1831 (Smithsonian NMAH)

Below is a Young Transit circa 1840-1850 [MCHS Exhibit]

SURVEYING AND SURVEYING INSTRUMENTS

Robinson
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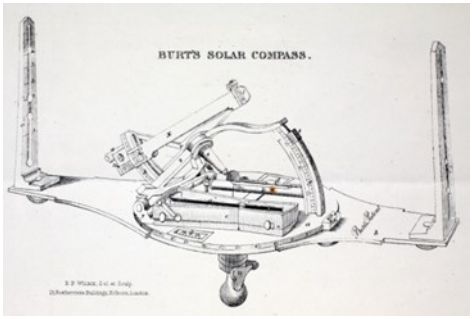
the true north direction by sighting the sun or other astronomical feature rather than by reference to the magnetic north.



Burt's Solar Compass Patent Sketch, 1836

Burt was awarded a patent in 1836 and had William Young build the prototypes. His patent expired in 1850 and he tried to have it renewed. However renewal was denied and he was asked to take compensation by the Land Commission of the Senate. Compensation did not materialize in his lifetime or after.

In the same year that the patent expired, the General Land Office adopted the solar compass as the standard instrument for use in surveying public lands with extreme magnetic disturbances. With the patent expired, other instrument manufactures began producing it. Most notably W. & L. E. Gurley who designed a Burt's Solar attachment for the transit.

While William Young was the most innovative instrument maker of his contemporaries and produced instruments of high quality, he produced only about 65 instruments a year during the period of 1830 to the 1850's. The Young enterprise continued to build instruments through 1918.

One of Young's chief competitors was W. & L.E. Gurley of Troy, New York. William Gurley was a civil engineering graduate from Rensselaer Institute, who after not finding work in his profession went to work as a foreman for Oscar Hanks, an instrument maker in Troy. He went into partnership with another Hanks employee Jonas Phelps and founded the firm of Phelps and Gurley. Gurley's brother, Lewis had apprenticed with Phelps and joined the firm after his graduation from Union College. In 1852, the Gurley's bought out Phelps' interest and the firm became W. & L.E. Gurley. The Gurley's bought the Hanks factory later in 1852 and began manufacturing high quality surveying instruments utilizing the concepts of the industrial revolution such as division of labor

Figure 3. Gurley Surveying Transit with Solar Attachment, 1885 [MCHS Exhibit]

and interchangeable parts. They utilized a comprehensive catalog which contained not only a listing of their instruments but their construction, use and adjustment. One of the firm's notable customers was John Brown. In 1855, he ordered several compasses. In 1859, just before the Harper's Ferry raid, he visited the Gurley factory and bought an illuminated compass for use at night.

Figure 3 shows a Gurley surveyors transit with the Burt solar attachment. By 1850, according to the U.S. Census, the industry had started to move West with four shops in Ohio and two in Missouri. By 1860, there were 116 makers and by 1870, 135 existed with instrument makers established as far west as California including eight in Missouri. By the 1900 Census, there were 265 makers. The industry was fueled by not only by the increasing number of surveyors and civil

Vernier Compass Transit, 1860-70 by Gurley [MCHS Exhibit]

Continued on Page 12

inches in diameter. The compass face measures eight inches with a seven inch needle. With its detachable sights it measures 10.75 inches high. It has two level vials at the south end and a vernier at the north end to adjust for magnetic declination ranging from 0 to 30 degrees in both the east and west directions. The compass dial is graduated into 1/2 degrees and is engraved "L.N. Nutz, Maker, St. Louis, 1853 for Benaiah Robinson." The compass has a two part Jacobs staff with a ball, socket and spindle assembly to support and level the compass in the field. The staff is 56.5 inches long.

The compass was made for Benaiah Robinson who Jeff Pauk calls one of the more influential County Surveyors of Madison County (See article on page 6). Robinson sold the compass to Gershom Flagg for $81.00 in 1853 when he moved with his family to the Oregon Territory, in all probability to take advantage of the Land Donation Act which gave every immigrant family to the Oregon Territory 640 acres.

The compass was donated to the Society by Mr. and Mrs. Willard G. Flagg.

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Library
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search for additional camps of the expedition, etc. Supplementing the hundreds of carefully labeled folders are books, magazines, newsletters, and maps. While this may sound like an overwhelming collection to catalog, I have found the hardest part is not the processing of the collection, but rather not being able to spend every day totally immersed in it!

SURVEYING AND SURVEY INSTRUMENTS

Railroad Compass (double vernier) with telescopic sight by Gurley. [MCHS Exhibit]

engineers and an expanding nation but by the significant immigration to the United States of Europeans, primarily Germans, Swiss, Irish and Italians who had a tradition of instrument making in their home countries. Companies with the names of Keuffel and Esser, Berger, Fauth, Bausch and Lomb, Randolph and Sala became the competitors of Gurley and Young. By the 1970s over ninety percent of the makers were either out of business or not making surveying instruments as European and Japanese firms captured the market with electronic and digital instruments.

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Gary Denue is a long-time collector of surveying instruments. He is an SIUE Emeritus Associate Professor and currently president of the MCHS.

MARY'S RESEARCH TIP

Cemeteries! How I love to wander through a cemetery searching for ancestors. Before I get to the cemetery I search through every published index or history I can find to (hopefully) help me find the ancestor I am seeking. Then I visit www.findagrave.com to see if there is any information on the cemetery or the ancestor I am seeking. Finally I pack my digital camera and notebook and head to the cemetery. A digital camera can produce amazing tombstone photos. I can quickly tell if the photo looks good enough or if I need another one. But the best part is the ability to zoom in on the photo when I get home and have it uploaded to my PC. All those small inscriptions that make me curse my bifocals show up clear and crisp and easy to read!