Historic Land Surveying

Social Studies Standards

Kindergarten - Yellow
1st Grade - Orange
2nd Grade - Green
3rd Grade - Light Blue
4th Grade - Red
5th Grade - Purple
Arkansas History - Grey

G.1.1.1 Show relationships between familiar places using map keys, legends, compass rose, and directional words
H.1.1.1 Explain similarities and differences of everyday life in different times using chronological terms.
H.1.1.3 Compare present day families, objects, and events with those in the past using visual representations, news stories, and artifacts (e.g., daily life tasks, food, clothing, transportation, communication, recreation).
H.1.1.7 Draw conclusions about life in the past using historical records and artifacts (e.g., photos, diaries, oral history).
G.1.2.1 Interpret the information on a map of local places using map keys, symbols, intermediate directions, scale, and compass rose.
H.1.2.3 Compare life in a community past and present using maps, photographs, news stories, artifacts, or interviews (e.g., transportation, communication, recreation, jobs, housing).
G.1.3.1 Describe the spatial organization of local and global places based upon the relative location, distance, direction, legend, compass rose, and scale on a map.
H.1.3.3 Compare life from a specific historical time period to life today noting changes over time (e.g., transportation, jobs, urban growth, population density, natural resources, communication).
G.1.4.1 Compare relative and absolute location (e.g., latitude and longitude) of local and global places on a map.
H.1.4.3 Compare life from a specific historical time period to life today to explain changes over time (e.g., economic growth, urbanization, resources, population density, environmental issues).
G.1.ARH.1 Compare and contrast the six geographic regions of Arkansas using geographic representations and available geospatial technologies (e.g., Global Positioning System, Geographic Information System)
H.1.ARH.3 Evaluate the human impact on water systems in Arkansas over time, including the use of aquifers for agriculture and the use of rivers and lakes for trade, transportation, recreation, and flood control such as the McClellan-Kerr Arkansas River Navigation System.

Vocabulary

Surveying:
examining and measuring the surface of the Earth for planning, preparing to build, or mapping

Map:
A two-dimensional, or flat, representation of Earth's surface or a portion of it.

Compass:
an instrument that shows the direction of magnetic north

Surveying Chain:
sixty foot chain composed of one hundred links for surveying land

Scope:
A surveyor stands at the compass with a scope to sight the staff and direct the surveyor with a staff where to go

Staff:
A surveyor stands with a staff with a flag at the corner of a quadrant to mark the end of the boundary

Vocabulary

Surveyor:
a person who measures land

Quadrant:
collections of quadrants are what make up maps

Louisiana Purchase:
1803 purchase of the Louisiana territory from France. Surveying of the Louisiana Purchase began in Arkansas.

Hunter and Dunbar Expedition:
expedition commissioned by Thomas Jefferson for the exploration of the Ouachita River and Hot Springs in today's Arkansas and Louisiana.

Vernier Scale:
A precise measuring tool from the 17th century used by surveyors to measure height, as well as distance.

Furlong:
A unit of distance equal to 220 yards (about 201 meters)

Context

In the 1800s, Arkansas was a relatively new state with much of its land still being divided and sold to settlers. Land surveying played a critical role in this process, as it established property boundaries, facilitated land sales, and contributed to the organized settlement of the region. Surveyors were essential figures in the expansion and development of the state.

The Importance of Land Surveying

1. Settlement and Development:

Accurate surveys were crucial for the orderly settlement of Arkansas. Surveys defined property lines, which were necessary for legal land ownership and avoiding disputes. Surveying helped in planning towns, roads, and infrastructure.

2. Economic Impact:

Surveying enabled the sale and distribution of land to settlers and speculators. It supported agricultural development by defining farm boundaries. Land speculation and real estate development relied on precise surveys.

3. Government Role:

The federal government, through the General Land Office (GLO), oversaw the surveying of public lands. Surveying was a prerequisite for the issuance of land patents and titles.

Context

Surveying Techniques and Tools

1. Surveying Instruments:
   - Compass: Used to determine direction and establish lines.
   - Chains: Measuring devices made of metal links, typically 66 feet long (Gunter's chain), used to measure distances.
   - Surveyor's Transit: An early form of theodolite, used for measuring horizontal and vertical angles.
   - Leveling Rods: Used in conjunction with a level to measure elevation changes.

2. Methods:
   - Compass and Chain Surveying: The most common method in the 1800s. Surveyors used a compass to establish directions and a chain to measure distances.
   - Baseline and Meridian System: A rectangular survey system established by the Land Ordinance of 1785. It divided land into townships and ranges using principal meridians (north-south lines) and baselines (east-west lines).

3. Surveying Process:
   - Initial Surveys: Establishing baseline and meridian lines as reference points.
   - Subdivision: Dividing townships (36 square miles) into sections (1 square mile each).
   - Fieldwork: Physically marking boundaries with stakes, stones, or blazed trees.
   - Mapping: Creating detailed maps and plats from field notes.

Context

Challenges of Land Surveying in Arkansas

1. Terrain:
Arkansas's diverse geography, including dense forests, mountains, and swamps, made surveying difficult. Surveyors had to navigate through challenging environments, often with limited visibility.

2. Weather and Climate:
Extreme weather conditions, such as heat, humidity, rain, and cold, impacted surveyors' work. Surveyors faced the risk of disease, particularly malaria, in swampy areas.

3. Accuracy and Tools:
Early surveying tools lacked the precision of modern instruments, leading to potential errors. Maintaining accurate records and measurements in the field was challenging.

4. Interactions with Indigenous Peoples:
Surveyors often worked in areas still inhabited or used by Indigenous peoples, leading to potential conflicts. Understanding and respecting existing land use and boundaries was necessary to avoid disputes.

Cultural and Social Aspects

Role of Surveyors:
Surveyors were highly respected professionals whose work was essential for community development. Their reports and maps were used by settlers, government officials, and land speculators.

Legal Implications:
Accurate surveys were vital for legal land transactions and resolving boundary disputes. Surveying errors could lead to legal battles and community tensions.

Community Development:
Surveying facilitated the establishment of towns, roads, schools, and other infrastructure. Surveyed lands were often advertised and sold to attract settlers to the region.

Context

Teaching Tips

- Visual Aids: Provided are maps, illustrations of surveying instruments, and diagrams of the baseline and meridian system.

- Hands-on Activities: Have students use a compass and measuring tape to conduct a simple survey on school grounds.

- Primary Sources: Included are surveyors' field notes, maps, and historical documents related to land sales and patents.

- Comparative Analysis: Compare 1800s surveying methods with modern techniques using GPS and digital mapping.

Discussion Questions:

- Why was land surveying essential for the settlement and development of Arkansas in the 1800s?

- What were the main challenges faced by surveyors, and how did they overcome them?

- How did accurate land surveys impact legal and economic aspects of community life?

Understanding land surveying in 1800s Arkansas helps students appreciate the complexities and importance of this profession in shaping the state's history and development.

Primary Source Analysis

On the following pages are primary sources for teachers to review with their students. As you review the materials, promote student inquiry. Be sure to ask them about things that they notice or things that they wonder. You may also ask students about the author's purpose, how this source ties into what they have learned in class or from prior knowledge.

Analyze a Photograph

Meet the photo.

What do you see?

Is the photo?

- ❑ BLACK AND WHITE
- ❑ COLOR

Is there a caption?

- ❑ YES
- ❑ NO

If so, what does the caption tell you?

Observe its parts.

Circle what you see in the photo.

PEOPLE OBJECTS BOTH

What are the people doing in the photo?

What are the objects used for in the photo?

Write two words that describe the photo.

Try to make sense of it.

Who do you think took this photo?

Where do you think this photo was taken?

List something that helps you prove where it was taken.

Why do you think the photo was taken?

How does this photo compare to modern times?

Use it as historical evidence.

Where do you think you could find out more information about the people or objects in the photo?

NATIONAL ARCHIVES

Analyze a Written Document

Meet the document.

Are there any special markings on the document? Circle all that apply.

STAMP

POSTMARK

HANDWRITTEN NOTE


OFFICIAL SEAL

SPECIAL LETTERHEAD


OTHER

Is it handwritten or typed?

❑  ❑  ❑ BOTH

Write down any words that you don't know. Then look up the definitions.

Try to make sense of it.

What is the main idea of the document?

List two quotes (words from the document) that help support the main idea.

Observe its parts.

Who wrote this document?

What is the date of the document?

Who read or received this document?

Use it as historical evidence.

Where do you think you could find out more information about the persons who wrote or received this document?

Where do you think you could find out more information about this event?

NATIONAL ARCHIVES

Analyze an Artifact or Object

Meet the Artifact.

What do you think it is?

Observe its parts.

What do you think the object is made out of? Circle all that apply.

BONE | CERAMIC POTTERY | FABRIC | GLASS | LEATHER | METAL | PAPER | PLASTIC | STONE | WOOD

How do you think the object feels? Circle all that apply.

HEAVY | LIGHT | SMOOTH

ROUGH | HARD | SOFT

What is the color of the object?

What is the shape of the object?

What size is the object? Circle one.

- ❑ SMALL LIKE A COIN
- ❑ MEDIUM LIKE A BASKETBALL
- ❑ LARGE LIKE A CAR

What are three words that describe the object?

Use it as historical evidence.

Where do you think you could find out more information about the object or the people who used it?

Try to make sense of it.

What do you think the object was used for?

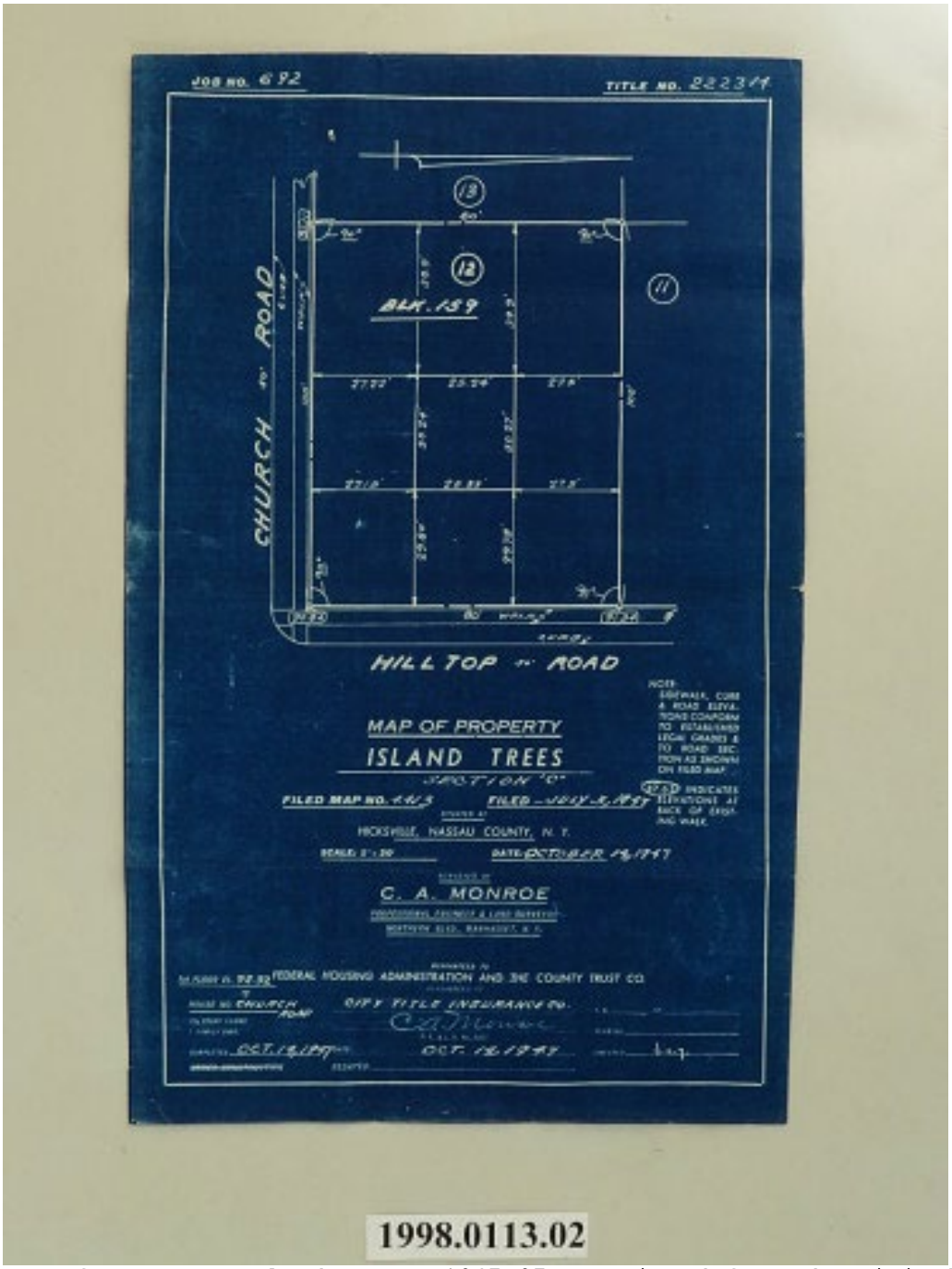
Who do you think would have used the object?

What does the object tell us about the time period when it was made and used?

Do we still use this object today? If so, how is it different?

NATIONAL ARCHIVES

Map



Monroe, C. A. Map of Property Island Trees. 1947-07. Retrieved from the Digital Public Library of America, http://collections.si.edu/search/results.htm?q=record_ID=nmah_214226&repo=DPLA. (Accessed June 25, 2024.)

Compass

Surveying Equipment. 1800-01-01-1800-12-31. Retrieved from the Digital Public Library of America, http://www.worthingtonmemory.org/scrapbook/realia/surveying-equipment. (Accessed June 26, 2024.)

Survey Chain

Surveying Equipment. 1800-01-01-1800-12-31. Retrieved from the Digital Public Library of America, http://www.worthingtonmemory.org/scrapbook/realia/surveying-equipment. (Accessed June 26, 2024.)

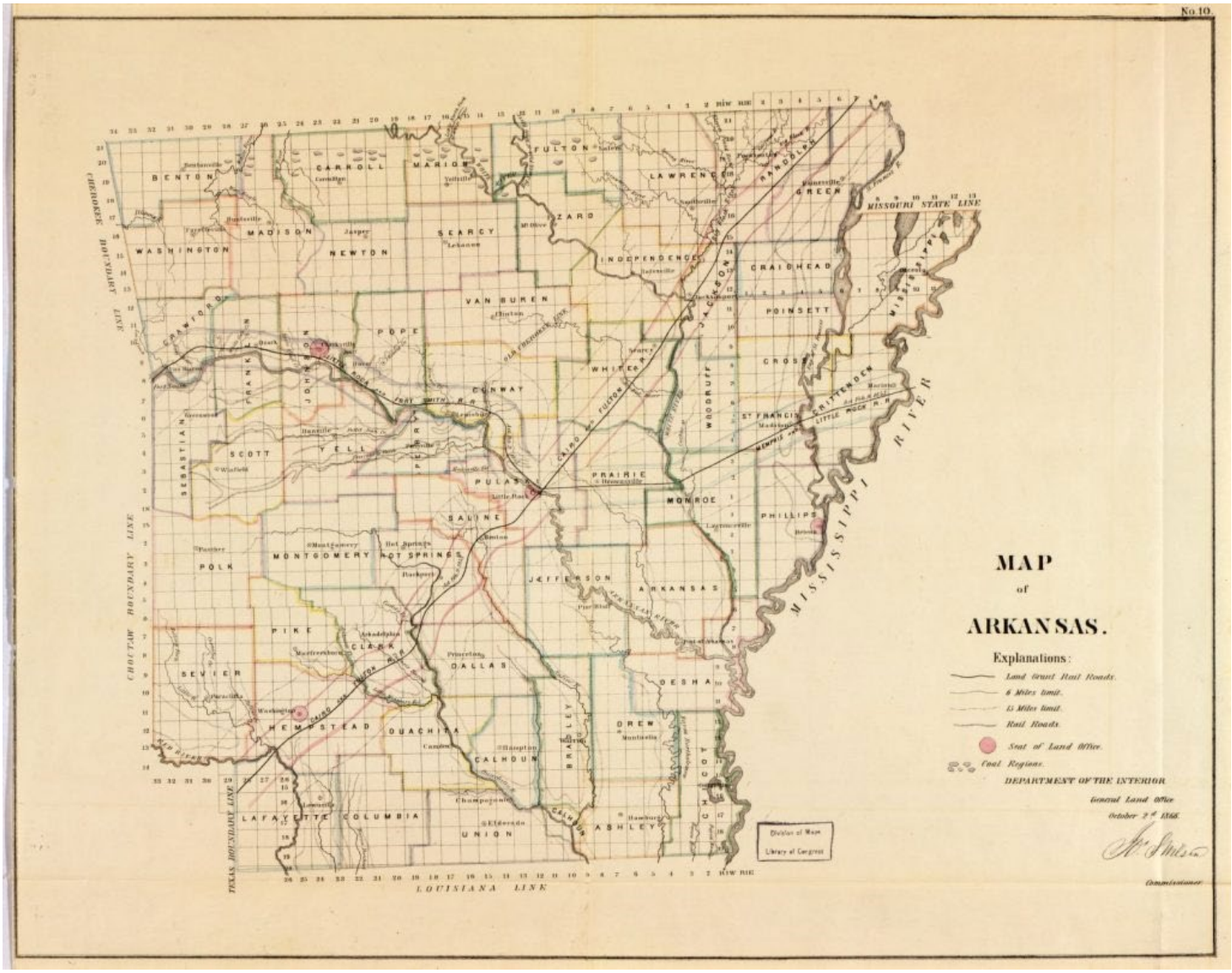
Survey Staff and Scope

Surveying Equipment. 1800-01-01-1800-12-31. Retrieved from the Digital Public Library of America, http://www.worthingtonmemory.org/scrapbook/realia/surveying-equipment. (Accessed June 26, 2024.)

Survey Chain

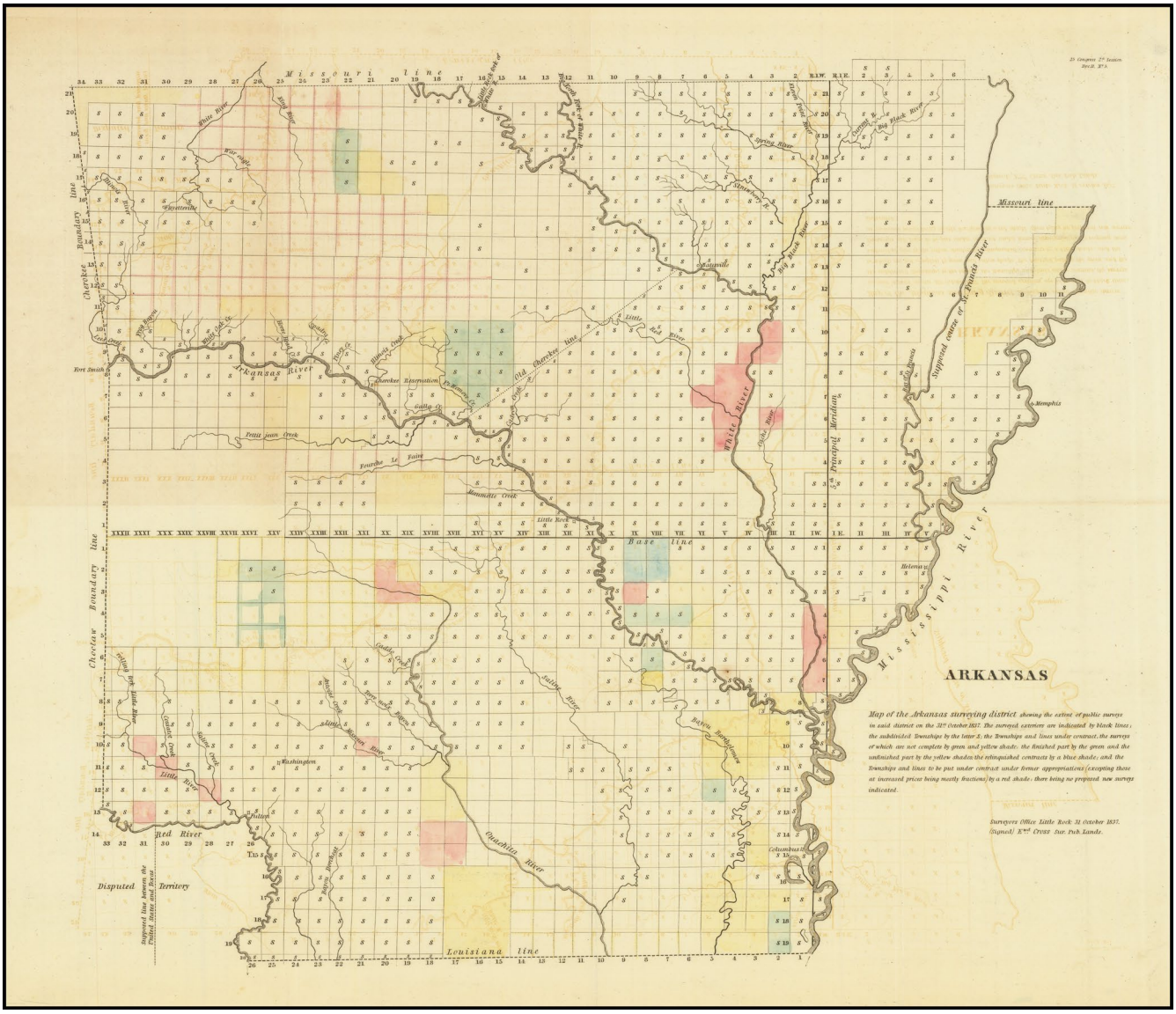
Steel survey chain. Retrieved from the Digital Public Library of America, https://texashistory.unt.edu/ark:/67531/metapth30401/. (Accessed June 26, 2024.)

Quadrant Map of Arkansas



United States General Land Office. Map of Arkansas. [S.l.: $b s.n., $, 1866] Map. https://www.loc.gov/item/2009579451/.

Quadrant Map of Arkansas



Surveyors Office little Rock, 31 October 1837, Map provide by C. Micheal White, Attorney, The White Law Firm.

Pages from The Civil Engineer’s Pocket Handbook