

# **Practical Tools, the Beginnings of Professional Practice, and the Founding of AAPG: 1900-1917**

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## **Abstract**

Subsurface structure contours have been used as a method in delineating anticlines since the 1870s. In 1902, William T. Griswold of the U.S. Geological Survey, created a technique to map structure contours using spirit leveling, and later, plane table and alidade. Griswold taught this technique to his geologists colleagues, such as Malcolm J. Munn, where it was used to identify anticlinal traps for petroleum exploration.

In 1908, Griswold left the U.S. Geological Survey and started one of the first geological consulting firms in the world with his former colleagues at the U.S. Geological Survey: Edgar McCrary and Fred Hutchinson. The company, W.T. Griswold & Company, also hired an employee named Kessack D. White, a student at the University of Kentucky. After two years, Griswold left to become the Chief Geologist of the Philadelphia Company. The firm was renamed the McCrary & Hutchinson and was in operation for five years in Marietta, Ohio, until it was dissolved in 1912.

In early 1913, Edgar McCrary moved to Tulsa to work for the Guffey-Gillespie Oil Company, where he established the first geologic exploration department within a petroleum company in Tulsa. He brought with him the technique of mapping subsurface structure contours using plane table and alidade. While as Chief Geologist for Guffey-Gillespie Oil Company, Edgar McCrary hired a geologist, J. Elmer Thomas, who he fired a few months later for being too soft for field work. Soon after he was fired, J. Elmer Thomas landed another position in the industry and very soon afterwards became the first President of AAPG. Malcolm J. Munn left the U.S. Geological Survey and moved to Tulsa in mid-1913, where he organized and headed the geological department of Gypsy Oil (Gulf Oil) company. This was the second oil and gas company to establish a geological department in the mid-continent. Malcolm Munn was the Chief Geologist with Gypsy Oil from 1913 through 1918.

Edgar McCrary, Malcolm Munn, and Kessack D. White are recognized as founders of AAPG. They showed that the use of the plane table and alidade was cost effective in the creation of detailed structure contour maps. Sydney Powers, in 1926, mentions that the technique was rapidly adopted in the mid-continent region, after it was introduced in 1913. Mapping structure contours using plane table and alidade was the practical technique that made the use of geology indispensable to oil and gas exploration, and enabled the founding of AAPG.

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# Practical Tools, the Beginnings of Professional Practice, and the Founding of AAPG: 1900-1917

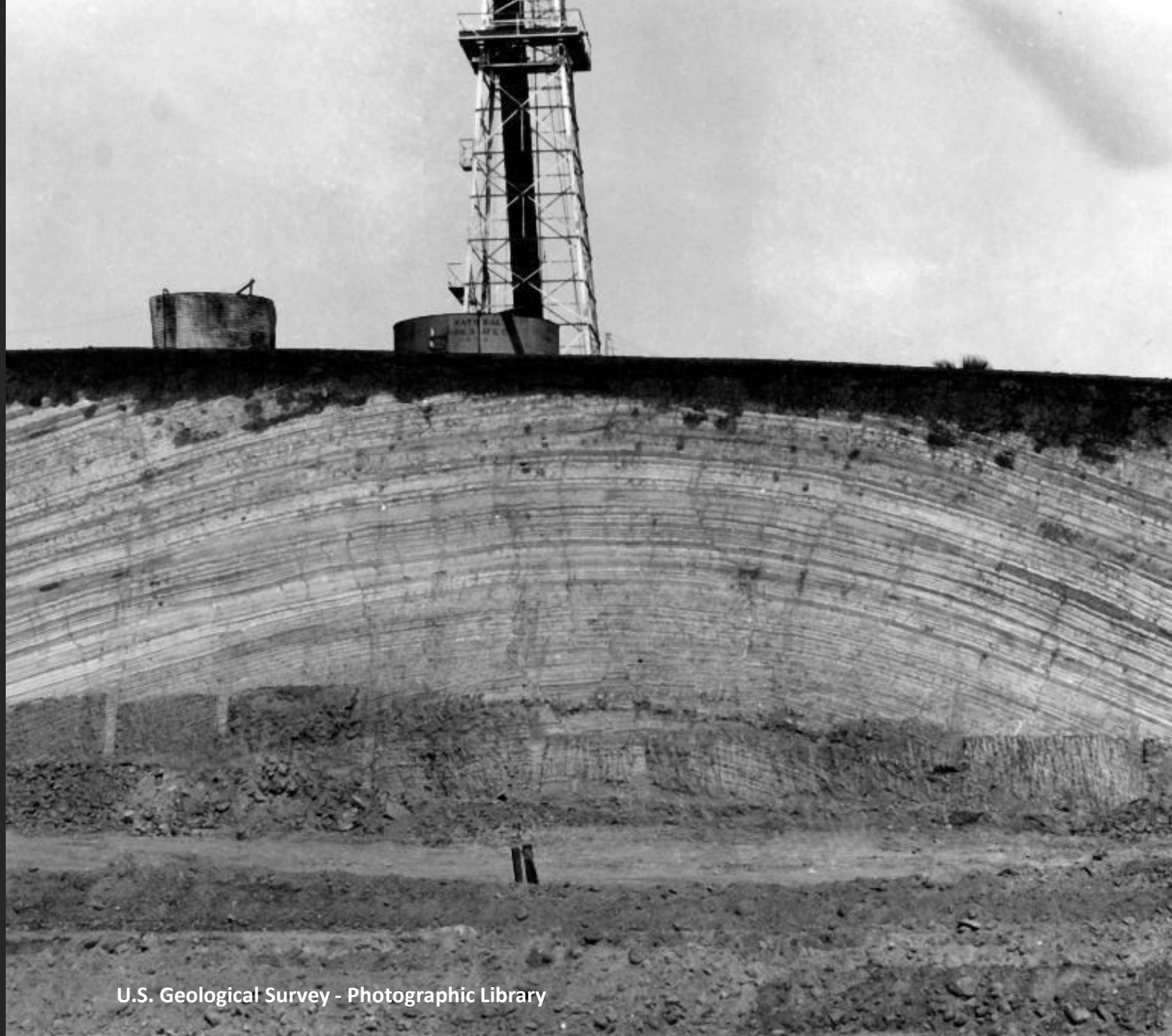
# Outline

- Anticlinal Theory/Structure Contours
- William T. Griswold – 1900-1912
- Marietta Ohio – 1908-1912
- Tulsa Oklahoma – 1913-1917
- Conclusions

U.S. Geological Survey - Photographic Library



# Anticlinal Theory/Structure Contour Mapping



U.S. Geological Survey - Photographic Library



# William Tudor Griswold 1859-1931

- Columbia School of Mines, C.E. 1881
- Topographer, USGS, 1883-1901
- Geologist, USGS, 1901-1907
- W.T. Griswold & Associates, 1908-1909
- Chief Geologist, Philadelphia Company, 1909-1917
- Independent Geologist, 1917-1927

# Cadiz 15-Minute Topographic Quadrangle

- Ohio Cooperative Topographic Survey – USGS & State of Ohio Project
- Surveyed in 1901
- Triangulation and Topography by W.T. Griswold

U.S. Geological Survey



THE  
BEREA GRIT OIL SAND

IN THE  
CADIZ QUADRANGLE, OHIO

BY  
W. T. GRISWOLD



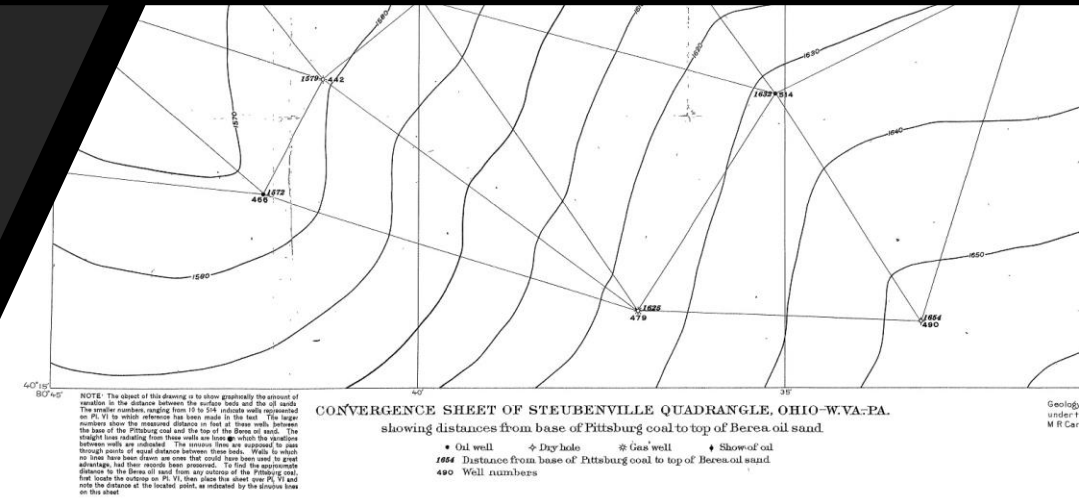
WASHINGTON  
GOVERNMENT PRINTING OFFICE  
1902

# Mapping Structure Contours

- Structure Contours
  - Use Existing Topographic Maps as Control
  - Mapped Elevations of the Outcrops
  - Mapped the Well Locations
  - Created a Structure Contour Map of the Pittsburgh coal bed
- Projecting Surfaces
  - Created a Convergence Sheet/Interval Map
  - Using the Convergence Sheet/Interval Map, Created Structure Contour Map of the Berea Sandstone

# USGS Method of Structure Contour Mapping

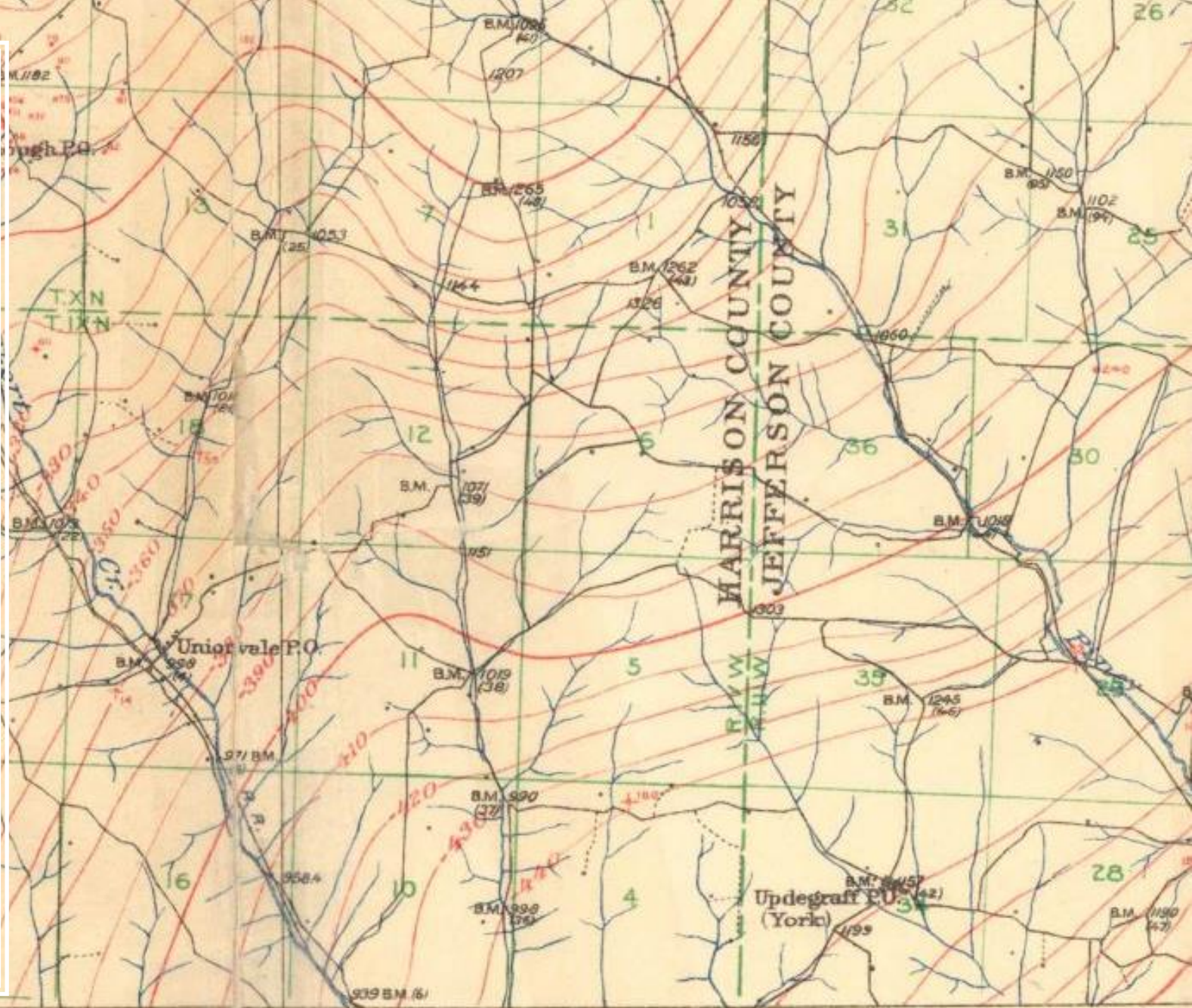
- Pittsburgh Coalbed Structure Contour Map
- Convergence Sheet (Isopach) between the Pittsburgh Coalbed and the Berea Sandstone



# Structure Contour Map

- Structure Contour Map of the Berea Grit Oil Sands, Cadiz, Ohio Quadrangle

U.S. Geological Survey



# Malcolm J. Munn

## 1874-1949

- AAPG Founder
- Attended University of Arkansas, 1894-1898
- USGS Geologist, 1899-1912
- Chief Geologist, Gypsy Oil, 1913-1918
- Consultant/Riverland Company, 1918-1919
- Munn Brothers, 1920-1949





JUNIOR CLASS

# Edgar Ware McCrary

- AAPG Founder
- Attended University of Arkansas 1900-1904
- Topographer/Geologist, USGS, 1904-1907
- Topographer/Engineer, Illinois State Geological Survey – 1907-1908
- Geologist, W.T. Griswold, 1908-1909
- Co-Owner & Geologist, Hutchinson & McCrary, 1910-1912



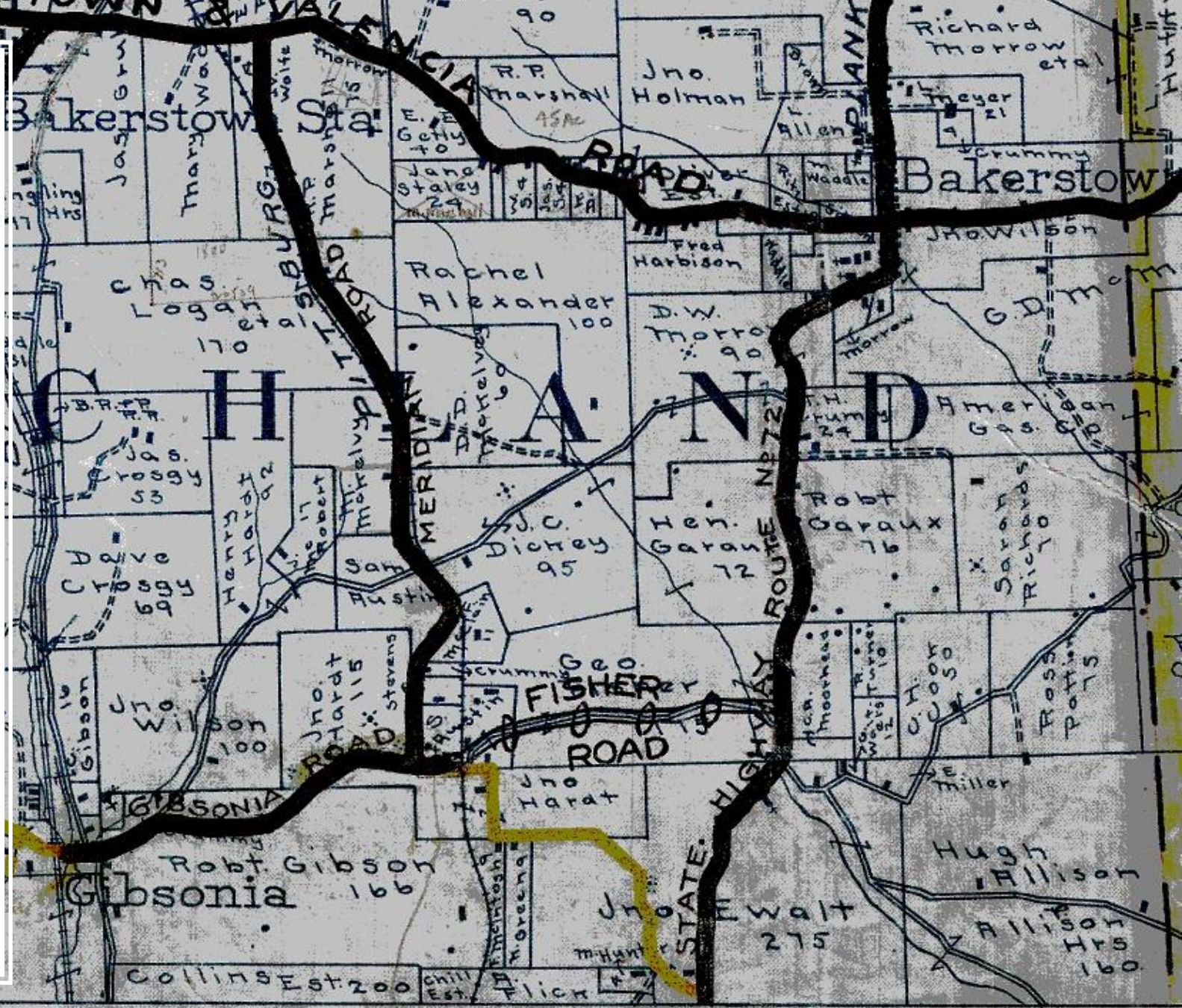
# Marietta Ohio – 1908-1912

- One of the 1<sup>st</sup> Consulting Oil Exploration Companies
  - W.T. Griswold and Associates – 1908-1909
  - Hutchinson & McCrary – 1910-1912
- Clients
  - Philadelphia Company
  - Guffey & Gillespie Oil Company
- Standard Products
  - Structure Contour Maps of Oil Producing Horizons
  - Farm Line Maps with Well Locations

# Farm Line Map

- New Kensington Quadrangle-NW
- 1 inch = 2000 feet (1:24,000-scale)
- Published 1912, Marietta Ohio
- One of the Standard Products
  - Farm lines
  - Well Locations

Northland Public Library, Pittsburgh, PA



HUTCHINSON & McCRARY  
MARIETTA OHIO

Scale 1 in = 2000ft.



# Tulsa Oklahoma - 1913

- McCrary to Tulsa Oklahoma – January 1, 1913
  - 1<sup>st</sup> Geology Department
  - Guffey & Gillespie Oil Company
  - One of his employees was J. Elmer Thomas, 1<sup>st</sup> President of AAPG
- Munn to Tulsa Oklahoma – July 1913
  - 2<sup>nd</sup> Geological Department
  - Gypsy Oil Company (Gulf Oil)/ Mellon Family
- Cities Services started Geology Department in August 1913



# Everett Carpenter

- AAPG Founder and Honorary Member
- Cities Services/Empire Oil Company
- His Discoveries in Kansas and Oklahoma were the Primary Driver in Adoption of Structure Contour Mapping in the Mid-Continent



# Sydney Powers

- AAPG Founder and President
- Okla. Geological Survey Bulletin 40 - Discusses the Influence of Griswold, Munn, and McCrary
- “E.W. McCrary ... introduced the method of plane table mapping which was developed by W.T. Griswold and others”

# Edgar Owen

- AAPG President & Sydney Powers Awardee
- “Griswold had one of the principal roles in the development of the USGS methods of working petroleum geology ... It was a program that practical oil men could appreciate”



# Conclusions

- Easy and Cost Effective Method
- Detailed Level of Mapping
- Spread Rapidly Throughout the Industry
  - Many of the AAPG Founders had worked for the USGS/State Geological Surveys
  - McCrary, Munn, and Carpenter Demonstrated the Ease and Cost Effectiveness of the Technique
- Final Technology Leading to the Use of Geology in Oil Exploration