Walking in the Footsteps
Of the
Colonial Surveyor

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Historical Development of Property Surveying

Egyptian Surveyors

Ogilby Map 1675
### Early Measurement Systems

<table>
<thead>
<tr>
<th>Gunter Chain</th>
<th>West Chain</th>
<th>Engineer Chain</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 link</td>
<td>7.92 inches</td>
<td>1 link</td>
</tr>
<tr>
<td>10 links</td>
<td>79.2 inches</td>
<td>1 link</td>
</tr>
<tr>
<td>20 links</td>
<td>158.4 inches</td>
<td>20 links</td>
</tr>
<tr>
<td>50 links</td>
<td>396.0 inches</td>
<td>50 links</td>
</tr>
<tr>
<td>100 links</td>
<td>792.0 inches</td>
<td>100 links</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Development of the English Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Barleycorns (laid lengthwise) = 1 Inch</td>
</tr>
<tr>
<td>12 Inches = 1 Foot</td>
</tr>
<tr>
<td>3 Feet = 1 Yard</td>
</tr>
<tr>
<td>5 Feet = 1 Span</td>
</tr>
<tr>
<td>5 Spans = 1 Ell</td>
</tr>
<tr>
<td>125 Paces = 1 Furlong (660 feet)</td>
</tr>
<tr>
<td>3 ½ Yards = 1 Rod (15.5 feet)</td>
</tr>
<tr>
<td>40 Rods = 1 Furlong (660 feet)</td>
</tr>
<tr>
<td>8 Furlongs = 1 English Mile (5280 feet)</td>
</tr>
<tr>
<td>12 Furlongs = 1 League (7920 feet)</td>
</tr>
<tr>
<td>1 Minute of Latitude at Sea Level = 1 Nautical Mile (6076.10 feet)</td>
</tr>
</tbody>
</table>
Early Accuracy Standards

English Accuracy Standards:
- Compass – nearest degree
- Survey chain – nearest pole/perch/rod

19th Century Standards:
- Compass – nearest ½ degree
- Survey chain – nearest ½ pole/perch/rod

1950 Standards:
- Transit – nearest 30 seconds
- Steel Tape – Tenth of a foot/temperature correction
Role of the Surveyor in Colonial America

- Determine Boundaries
- Lay Out Towns
- Survey Farm Land
- Report Settler & Indian Movements
- Write Deeds and Land Warrents
Role of the Surveyor in Colonial America

- Evaluating Land for Settlement
- Representative for Land Proprietor (Thomas Freeman for Washington)
- Legal Forms and Paperwork

Measuring with a Two-Pole Chain – Georgia 1792
Land Grants

► William Penn, 1625, 29 million acres
  • Thomas Holme - 1681 First Survey
  • Problems with Early Surveys
  • Lay out Philadelphia
► Purchase Indian Right
► Calverts - (Lord Baltimore)

Land Grants

► Virginia - Fairfax 1st Charter - 1606
► Carolina - 1663 (includes Georgia)
► Georgia - 1732 by Charter
► United States – 1789
► Western Lands- Lands west of colonies to Mississippi river
Surveyor’s Training

Important Books
- Aaron Rathborne - 1616
- Vincent Wing - 1700
- William Leybourn - 1722
- John Love - 1688
- Robert Gibson - 1785 (First Printed American Book)

Surveyor’s Training

Early Teachers
- Theophilus Grew - College of Philadelphia
- Charles Peale
- John Clare
- James Cosgrove
- Andrew Lamb - Latitude & Longitude
- Learning Surveying in the field
Surveyor’s Training

Early Field Surveyors
- Thomas Holme
- Moses McClean
- Andrew Porter
- John Morton
- Lightfoot Family
- Scull Family
- Ellicott Family
- Thomas Freeman

Instruments of the Surveyor

Small Surveys
- Chain
- Compass
- Offset Staff (10 Links)
- AX and Field Equipment

Latitude & Longitude Surveys
- Clock (weight-driven Pendulum)
- Zenith Sector
- Plane Table
- Reflecting Telescope
- Transit Instrument
- Theodolite
- Quadrant
- Sextant
Field Surveying

- Using the Compass
- Chaining
- Field Notes
- Other Field Equipment
- Marking the Corners

Marking the Trees

Mark the Trees
Fairfax Line Survey

► Why is the Fairfax Line Unique?
► Location of the Fairfax Line
Fairfax Line Survey

► Why the Survey?
► The Politics involved in getting the line set
Fairfax Line Survey

- Exploration Surveys of the 1730's
Fairfax Line Survey

Rulings of the Privy Council

The Actual Survey of 1746:
- Notes kept by Thomas Lewis
Fairfax Line Survey

Preparation of the Map and Report of Survey
Mason-Dixon Line

- Quaker Penns vs. Catholic Calverts
- 1760 Court of Chancery Decree
- Penn’s Lower Counties
- Town of New Castle (Courthouse)
- Charles Mason & Jeremiah Dixon - 1763
- Checked Out Earlier Work
- Surveyed Delaware
- Line 244 miles long and 8 yards wide

Mason-Dixon Line

- Mile Stones
- 5 Mile Stones
- Penn Family to the North - Lord Baltimore to the South
- 2 years when work was stopped 23 miles short
- Indians of the seven nations halt the work
- Return to England & collected $75,000 fee
Mason & Dixon Measuring Rods

16 ½ foot long
Levels as used by Mason & Dixon

Other Major Surveys

- Finishing the Mason Dixon line 1784
- South Line of Pennsylvania to 5 Degrees Longitude - 1785
- Western Boundary of Pennsylvania - 1785
- North Line of Pennsylvania - 1787
  - Andrew Ellicott and Andrew Porter
- Washington, DC - 1792
- Spanish Florida / United States - 1796
- North Carolina / Georgia - 1811

Finishing the Mason-Dixon Line

1779 Commissioners agree that the line should be finished
1784 Commissioners from Pennsylvania and Virginia established
Virginia – Dr. James Madison (President of William and Mary), Robert Andrews, John Page and Andrew Ellicott
Pennsylvania – Dr. John Eswing (University of Pennsylvania), John Lukens (Surveyor General of Pennsylvania), Thomas Hutchins and David Rittenhouse
Finishing the Mason-Dixon Line
1785 Setting the west line of Pennsylvania
West line to be five degrees West of Delaware River
Run the Western Boundary of Pennsylvania
Andrew Ellicott received an honorary Degree of Master of Arts on August 13th 1784 from the University of Williamsburg for his work on this survey
North line of Pennsylvania in 1787 (Andrew Ellicott and Andrew Porter)

Surveying the Federal City
1791- George Washington & Commissioners appoint Major L’Enfant as Engineer and Andrew Ellicott as Surveyor for The Federal City (Washington, DC)
1791 The black scientist and mathematician was part of the team working on the Federal City His main job was to regulate the astronomical clock
1792 After Major L'Enfant was released by Washington, Ellicott finished the final map
Other Surveys by Ellicott

1795 – Commissioned by the State of Pennsylvania to survey the cities of Erie, Franklin, Warren and other Pennsylvania lands

1796 - Survey the 31st degree of latitude between Spanish Florida and the U.S. from the Mississippi River to the Atlantic ocean
31 Degrees of Latitude by Andrew Ellicott

1796 – Left Pittsburgh with Thomas Freeman and about seventy men including thirty military
1797 – Arrived in spring only to find the Spanish deliberately obstructing implementation of the survey. Assisted in the Natchez rebellion
1798 – Initiate the survey from the Mississippi River East to the Pearl River
1799 – Returned to the survey after spending the winter in New Orleans. Set the Ellicott stone North of Mobile, Alabama. Reached the Chattahoochee River in the fall. Spent the winter months sailing around Florida to St. Mary’s Inland.
1800 – Finish the work on the line, returned to Philadelphia to file his official report
1801-1803 – Sell his library because payment was slow in coming. Publish his Journal of the trip in 1803
City of Philadelphia Regulators

1682 – Original surveys of the City of Philadelphia were started by Thoms Holme
1683 – Original surveys of the city finished
1710 – City of Philadelphia act appointed surveyors to regulators party walls.
1803 – Northern Liberties part of the city established, resulting in the painting of the Regulators.
1885 – Act created 14 different districts in the city, each controlled by a surveyor/regulator
1924 – Evaluation of the different standard of measurement used in the city
City of Philadelphia Regulators Measuring Frame/Gate
20 Feet Long
Men of the Western Lands

1783 – Colonial surveys in the Northwest Territory
1784 – Original Land Ordinance for ascertaining the mode and disposing of land in the western Territory
1785 – The Seven Ranges
1787 – The failure of the original Seven Ranges surveys – only four of the seven completed by Thomas Hutchins
1789 – The Ohio Land Company at Marietta, Ohio
Men of the Western Lands

1803 – Training Meriwether Lewis by Andrew Ellicott
1804 – Lewis and Clark and the Northwest exploration
1806 – Freeman and Curtis and the Southwest exploration
1805 – Start of the Government Land Office surveys in the Alabama and Indiana Territories
1806 - End of the Colonial period.

The End
Thank You

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