


 "From the wisdom of the ages  
to the challenges of modern world"

**FIG WORKING WEEK**  
**17-21 MAY SOFIA BULGARIA** 2015

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**Surveying: The Second Paradigm**

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## The First Paradigm - 1

- **Pre History**
  - Armenian tablets showing property areas
- **The Egyptians**
  - Astronomy
  - Geometry
  - Linear and angular measurement (the Pyramids)
  - Topographical maps (irrigation)
  - Crops (taxation)
  - Re-instatement of boundaries (after flooding)



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## The First Paradigm - 2

- **The Greeks**
  - Tunneling
  - Town layout
  - Geodesy
  - Cartography
- **The Romans**
  - The agrimensores laying out garrisons
  - The aqueducts
  - The roads
  - Land law



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## The Sources of the Second Paradigm - 1

- **Mathematics**
  - From the East, brought by the Moors through Spain
  - The Decimal System
  - Logarithms
  - Advances in astronomy and navigation
  - Trigonometry - triangulation



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## Sources of the Second paradigm - 2

- **Angular Measurement**
  - Lenses
  - The telescope
  - The "theodolitus" (1570)
  - Cross hairs
  - Vernier scales (1631)
  - The level bubble (1666)
  - Machine division of the circle (1770)



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## Sources of the Second Paradigm - 3

- **Linear Measurement**
  - Form feudal rights to individual property rights
  - Standardisation of weights and measures
  - Standards of length and areas
  - Gunter's Chain
  - Calculated measurement by triangulation



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## Is Their Third Paradigm?

- **Aerial photography**
- **Electronic Linear Measurement**
- **Computerised calculations**
- **Miniturisation**
- **Digitisation**
- **Computerisation**
- **3D Modelling**
- **UAV**



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