Hagen Mounds:

Magnetic Exploration at a Lower Illinois Valley Mound Group

By: Benjamin D. Rohde
Research Direction

- Magnetic Survey of Hagen Mounds
- First Magnetic Analysis of Mounds In Illinois Valley
- Hagen Mounds Pristine Condition Is Ideal For Survey
- Do Mounds Display Distinctive Magnetic Signatures?
- How Does It Relate To The Archaeological Record?
- What Are The Ethical Benefits?
The Lower Illinois Valley: Calhoun County
Hagen Mounds

- Hagen Mounds
- Landowner: Dale Hagen
- Illinois River: 2.5 km
- Swan Lake
- Largest mound
- 2-3 mounds
- Hagen

Landowner: Dale Hagen
Middle Woodland Occupation of the Illinois Valley

Time Frame: 2,000 Years Ago

- Havana Complex of the Hopewell Tradition
- Havana Hopewell: 150 BC-350 AD
- Mississippi & Illinois River Valleys - epicenter of occupation
Investigations

- Aerial Photo Analysis
- Topographical Map Analysis
- Topographic Mapping
- Geophysical Survey With Gradiometer
1940 Historical Aerial

plowing

dense overgrowth
2009 Aerial

- Tree reduction result of land maintenance
- Little agricultural encroachment
- Magnetic Survey
Topographical Maps

1939

1995
Topographical Maps (bedrock)

Burlington Limestone (outcropping)

Burlington outcropping
Hagen Site Is Ideal For Magnetic Survey

- Pristine Condition
- Untouched By Agriculture
- Magnetically Clean Of Historical/Modern Metals
- Little Tree Cover
What Is Magnetometry?

- Maps Spatial Variation Of Earth's Magnetic Field
- Variation In Magnetic Signatures Produces Anomalies
- Anomalies: Magnetic Signatures That Contrast Against The Natural Surrounding Magnetic Background
- Prehistoric Anomalies: Low Magnetism
Anatomy of a Middle Woodland Mound

capping layer

peripheral burial

base soil

log crypt

bundle burial

ramp
What Causes these Anomalies?

Metal Pipeline

Pit Feature

Gehring Site (11MS99)

House Postholes/trenches

Pit Feature

Storage Pit

Hearth
A Mounds Magnetic Signature

Goodall Site (12LE9)

Mound 17

Middle Woodland Mound
In Indiana

Mound 18
Magnetic Survey Of Hagen Mounds

- Seven 20 x 20 Meter Grids
- 1 Meter Transects
- Grids Surveyed 2x for Accuracy
Magnetic Hygiene

Level Instrument

Staying On Pace

Manipulating Obstacles
Topographical Mapping With Total Station

- Contours = 25cm
- Grid Corners
- Obstacles
- Topographical Points
Overlaid With Contours In GIS

Variance Congruent With Contours

Strong Support For A Magnetic Signature Of A Mound

Contours Not Congruent

Possible Mound
Conclusions

- Magnet Data Does Show Distinct Variation In at Least Two Mounds
- It Appears Hagen Mounds Has A Conclusive Magnetic Signature
- Some Anomolies Could Represent Prehistoric Features
- Ongoing Magnetic Survey Would Establish A Comparative Database of The Signatures Of Mounds
Ethical Implications

- Magnetometry is non-intrusive exploration.
- Useful for documenting looted mounds.
- Discovering, destroying, or losing mounds.
- Exploring while preserving the record.
- Protecting the sacred past.
Acknowledgments

Thank you very much to Dale Hagen for access to such a wonderful site. Thanks to the SIUE Anthropology Professors and Seniors. Special thanks to Dr. Vogel for the insight and undoubted guidance throughout this research. Very Special Thanks to Greg and Michelle Vogel and SIUE Anthropology student Paul Barber for the helping hands that are so often needed while in the field.