



# REVEALING THE ROMAN FRONTIER IN A MODERNLY ALTERED LANDSCAPE. THE CASE STUDY OF LIMES TRANSALUTANUS

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**PN-II-PT-PCCA-2013-4-0759 *Interdisciplinary technology for archaeological field survey. Case Study – Limes Transalutanus south of Argeș River***



## THE ROMAN FRONTIER IN DACIA

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#### ARCHAEOLOGICAL CHALLENGES

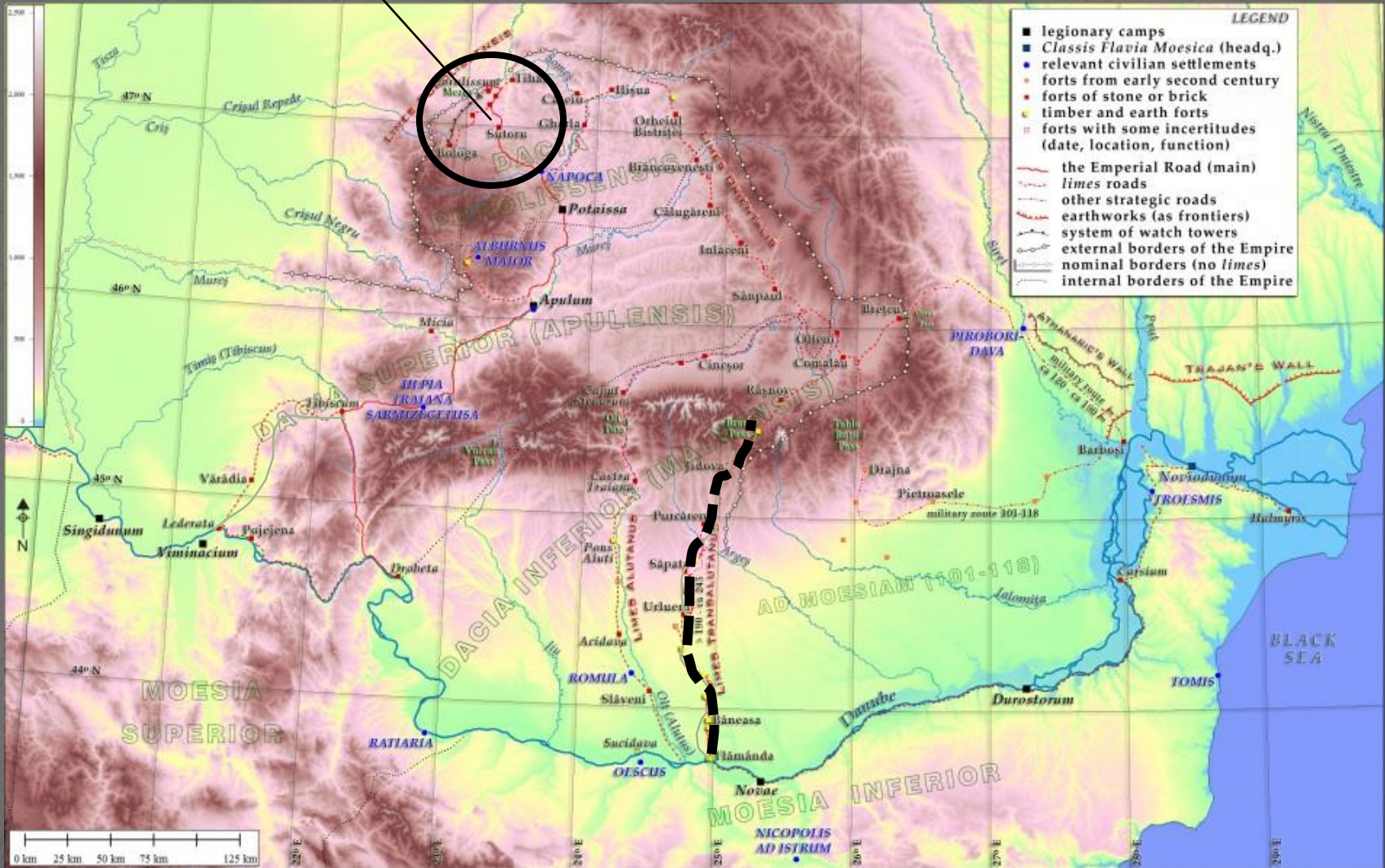
#### RESEARCH METHODS AND PRELIMINARY RESULTS

- HISTORICAL CARTOGRAPHY AND TOPONYMY
- AERIAL PHOTOGRAPHY AND REMOTE SENSING
- GEOPHYSICS
- ARCHAEOLOGICAL FIELD SURVEY

#### FUTURE PROSPECTS



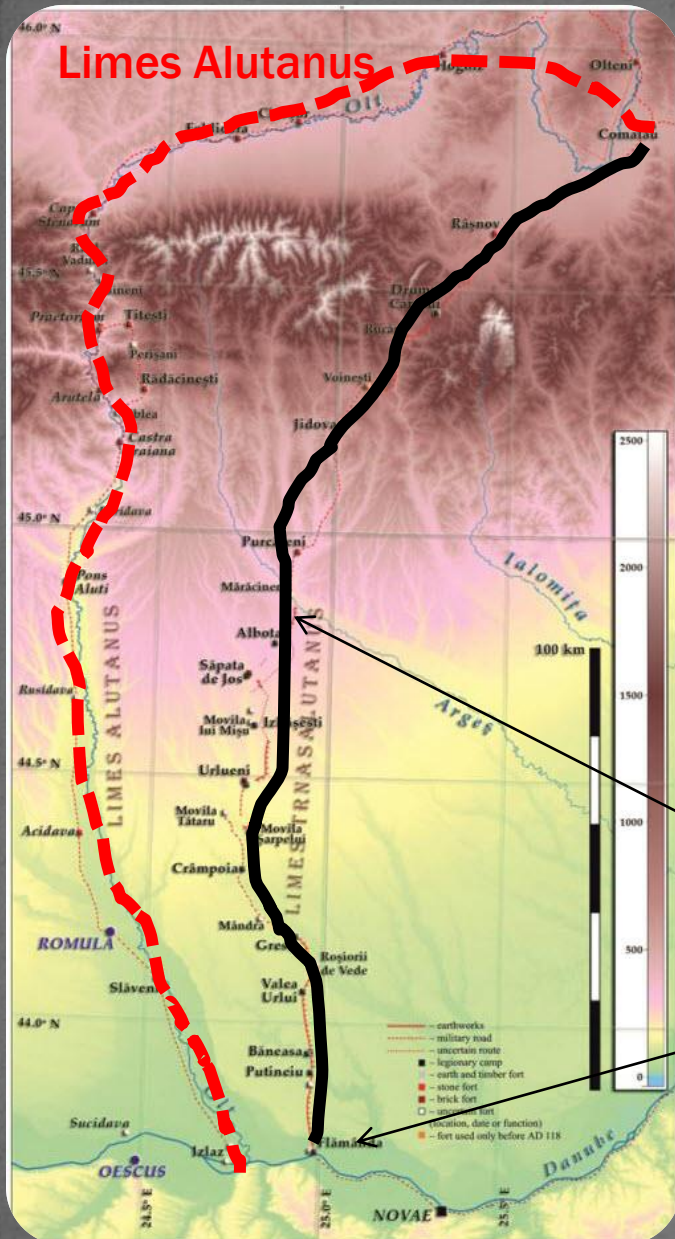
# THE ROMAN FRONTIER IN DACIA



Eugen S. TEODOR, Dan ȘTEFAN – **Technological challenges on the Limes Transalutanus**, *Antiquity Project Gallery*, 342 (Dec. 2014)



# THE ROMAN FRONTIER IN DACIA



Limes Transalutanus

## LIMES TRANSALUTANUS

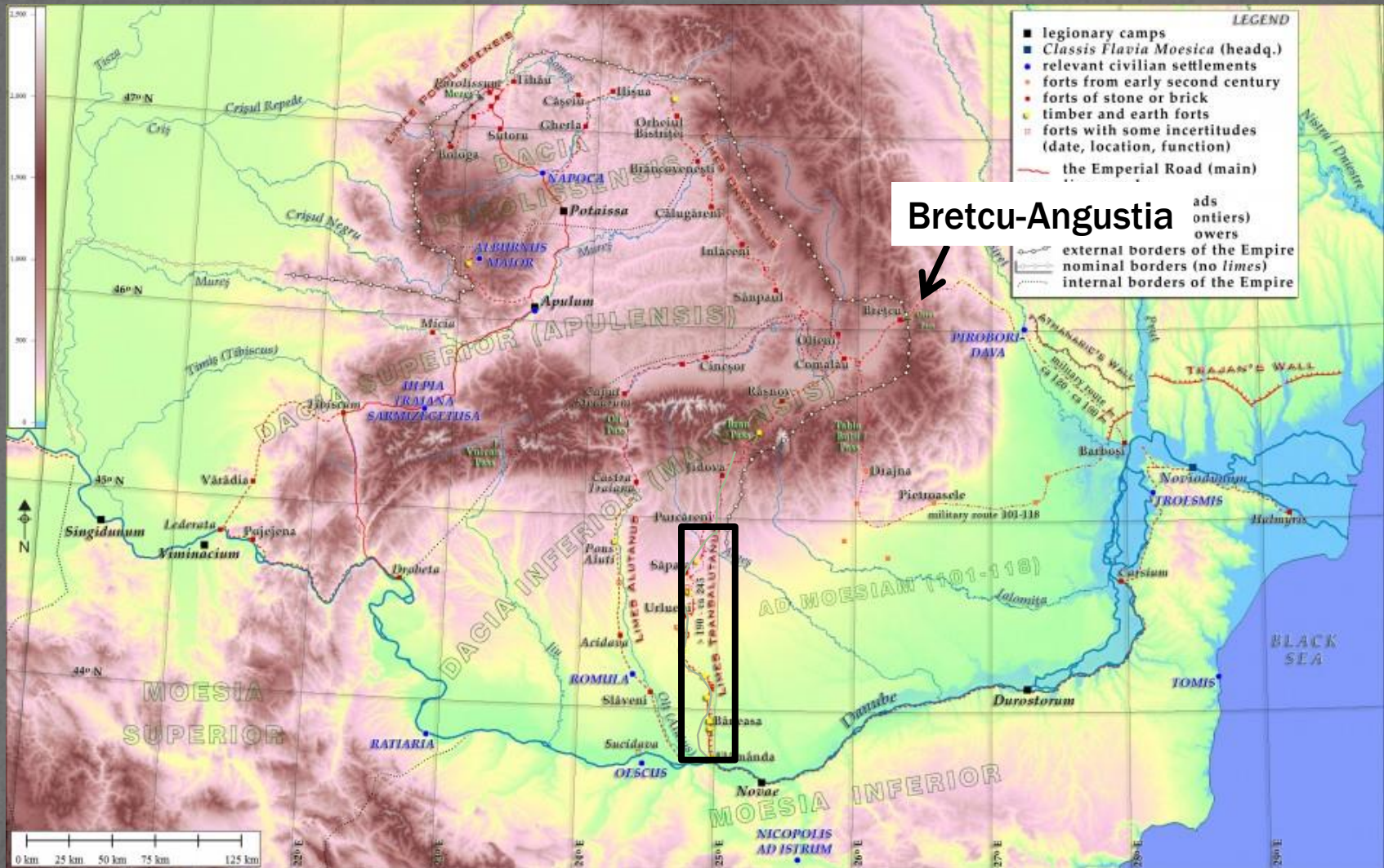
SOUTHERN SEGMENT: 55 KM

CENTRAL SEGMENT: 40 KM

NORTHERN SEGMENT: 57 KM



## SHORTEST ROAD TO THE MOST EASTERN LOCATED FORT OF THE PROVINCE







## THE ROMAN FRONTIER IN DACIA

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# RESEARCH METHODS AND PRELIMINARY RESULTS



## THE ROMAN FRONTIER IN DACIA ARCHAEOLOGICAL CHALLENGES

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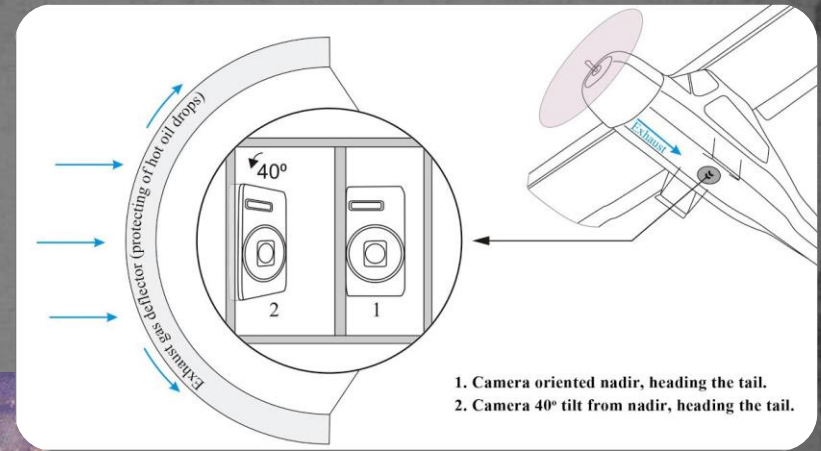
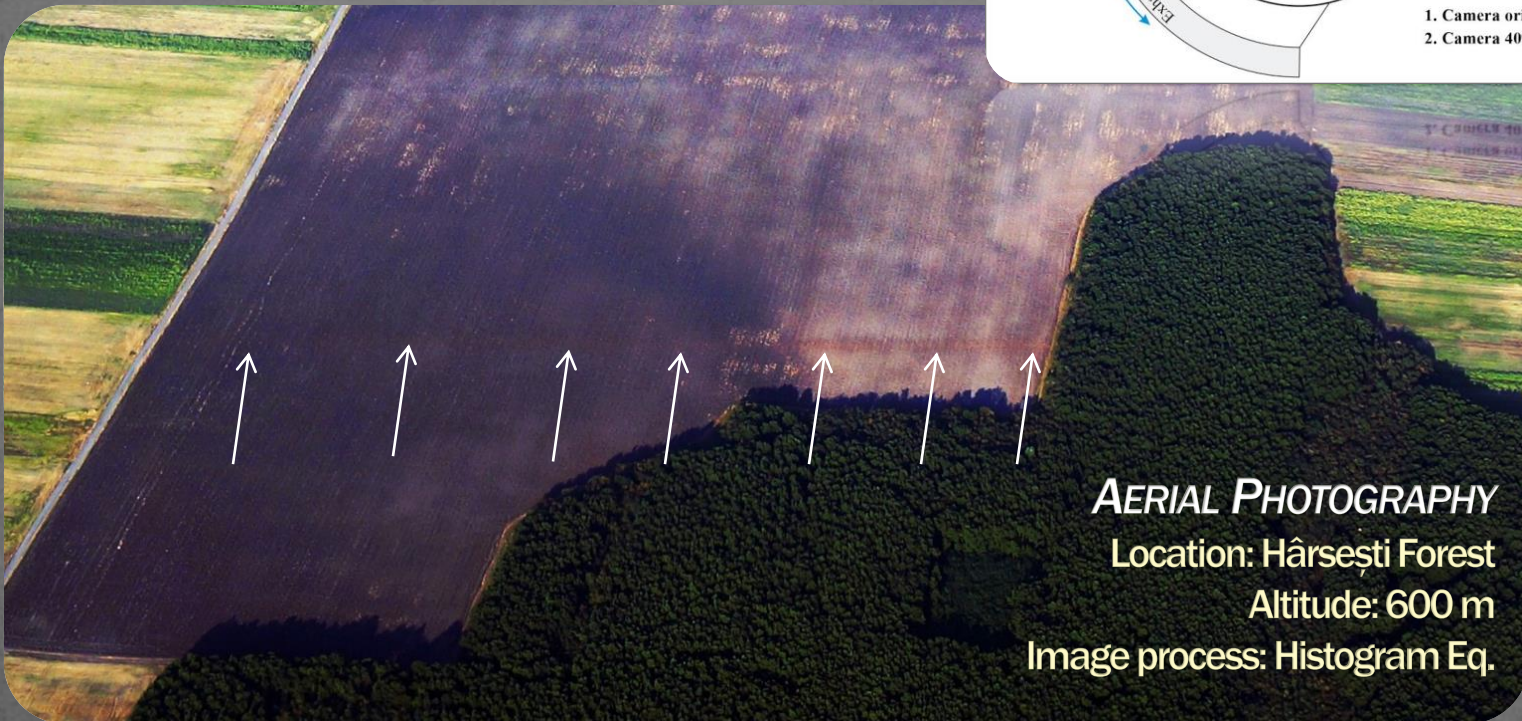


# RESEARCH METHODS AND PRELIMINARY RESULTS

## AERIAL PHOTOGRAPHY AND REMOTE SENSING



### Detecting Features and Structures



1. Camera oriented nadir, heading the tail.
2. Camera 40° tilt from nadir, heading the tail.

### AERIAL PHOTOGRAPHY

Location: Hârsești Forest

Altitude: 600 m

Image process: Histogram Eq.



# RESEARCH METHODS AND PRELIMINARY RESULTS

UNMANNED AERIAL VEHICLE (UAV)

MULTICOPTERS = MULTI-ROTOR FLYING PLATFORMS ABLE TO CARRY CAMERAS AND OTHER SENSORS



## MULTICOPTERS

- QUADCOPTER
- HEXACOPTER
- OCTOCOPTERS



# RESEARCH METHODS AND PRELIMINARY RESULTS



FORTIFICATION SYSTEM AND ROAD ON ROMAN LIMES

OBLIQUE IMAGE

ALTITUDE: 250M

HEAVY-LIFT HEXACOPTER

Mapping the route

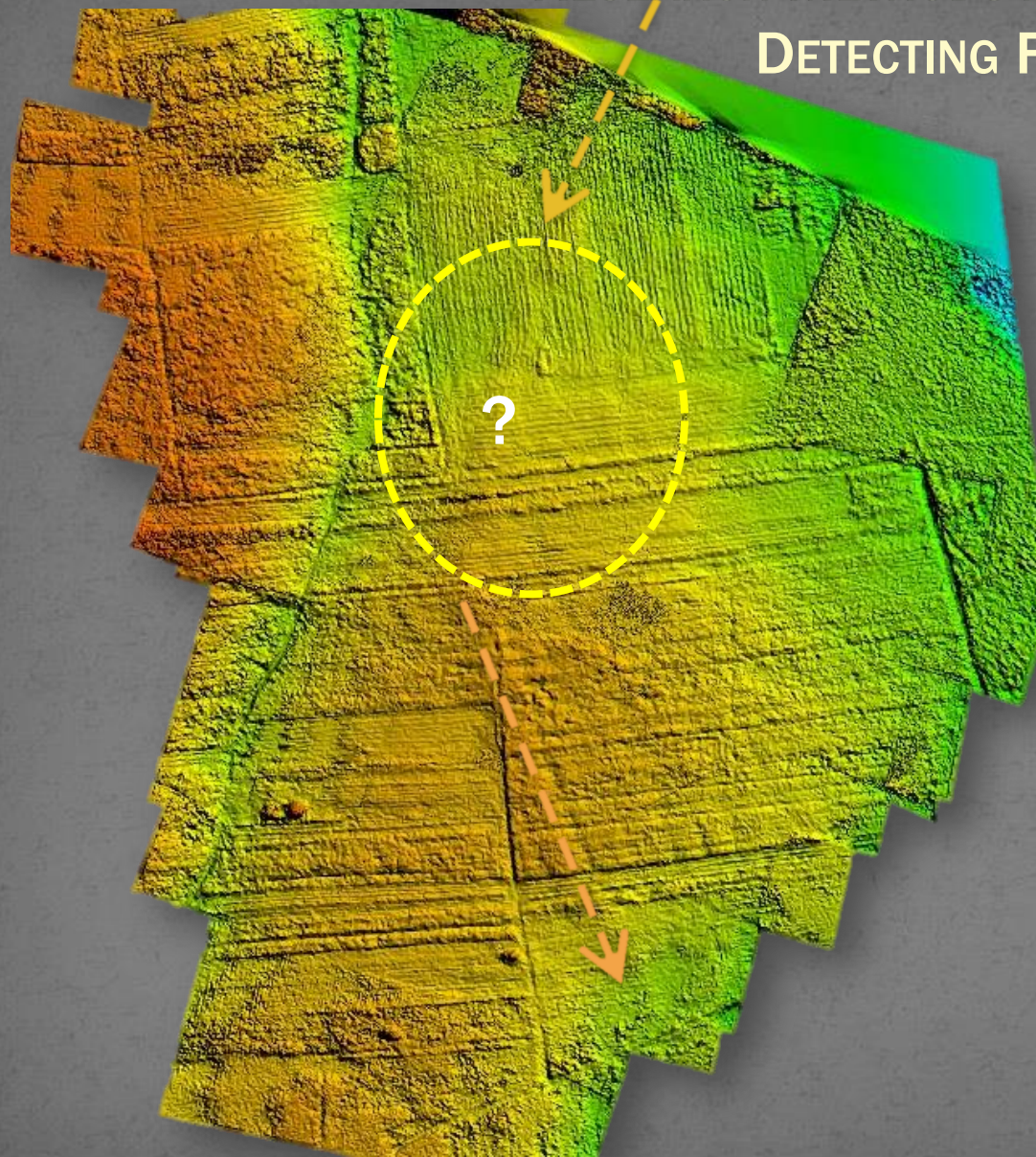


# RESEARCH METHODS AND PRELIMINARY RESULTS DETECTING FEATURES AND STRUCTURES





# RESEARCH METHODS AND PRELIMINARY RESULTS DETECTING FEATURES AND STRUCTURES



ROMAN LIMES – *TRANSALUTANUS*

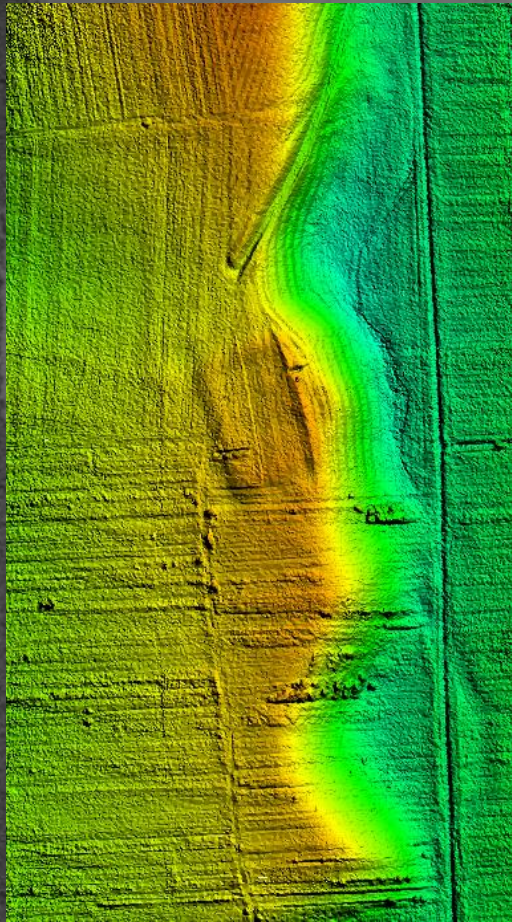
ORTHORECTIFIED IMAGERY

DEM

Project PN-IPCCA-2013-4  
Ctr. 317/2014



# RESEARCH METHODS AND PRELIMINARY RESULTS



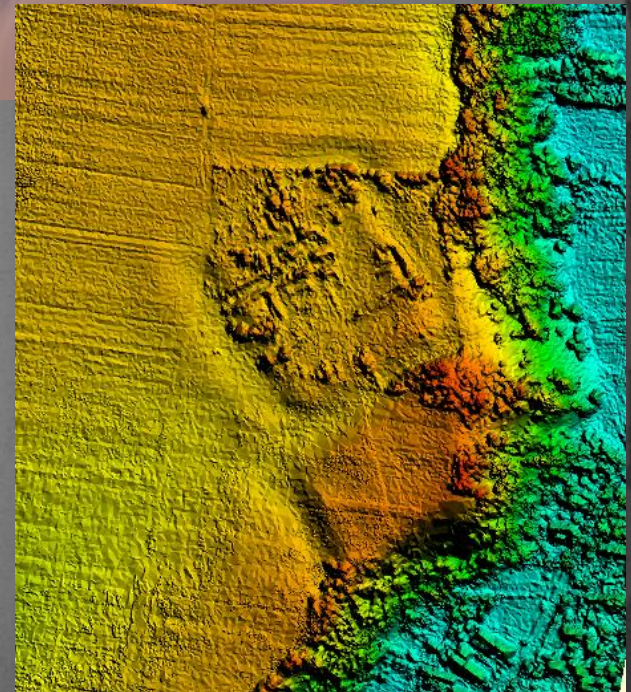
Crâmpoia fort  
& road

Forts



Urlui - fortlet

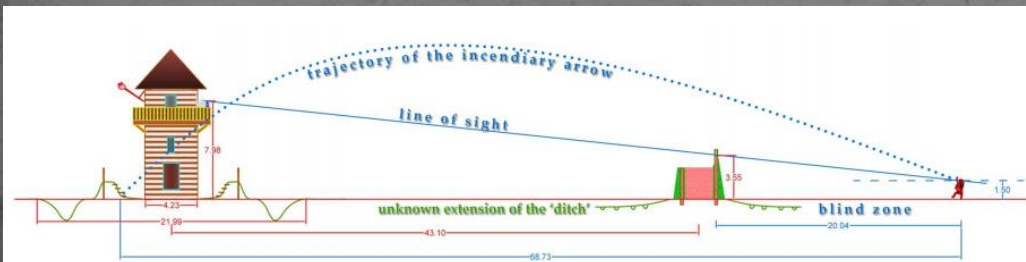
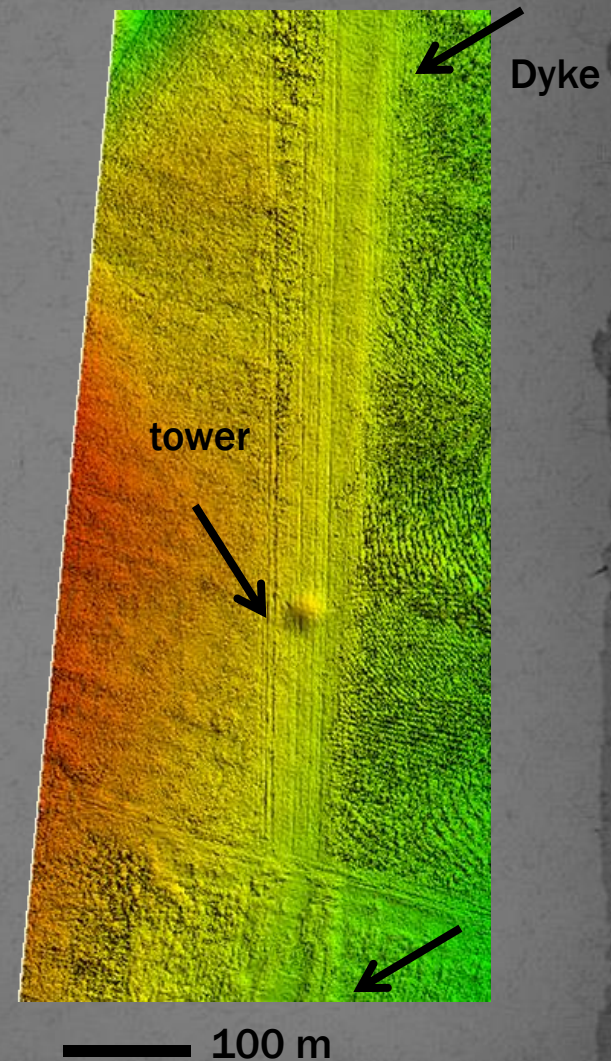
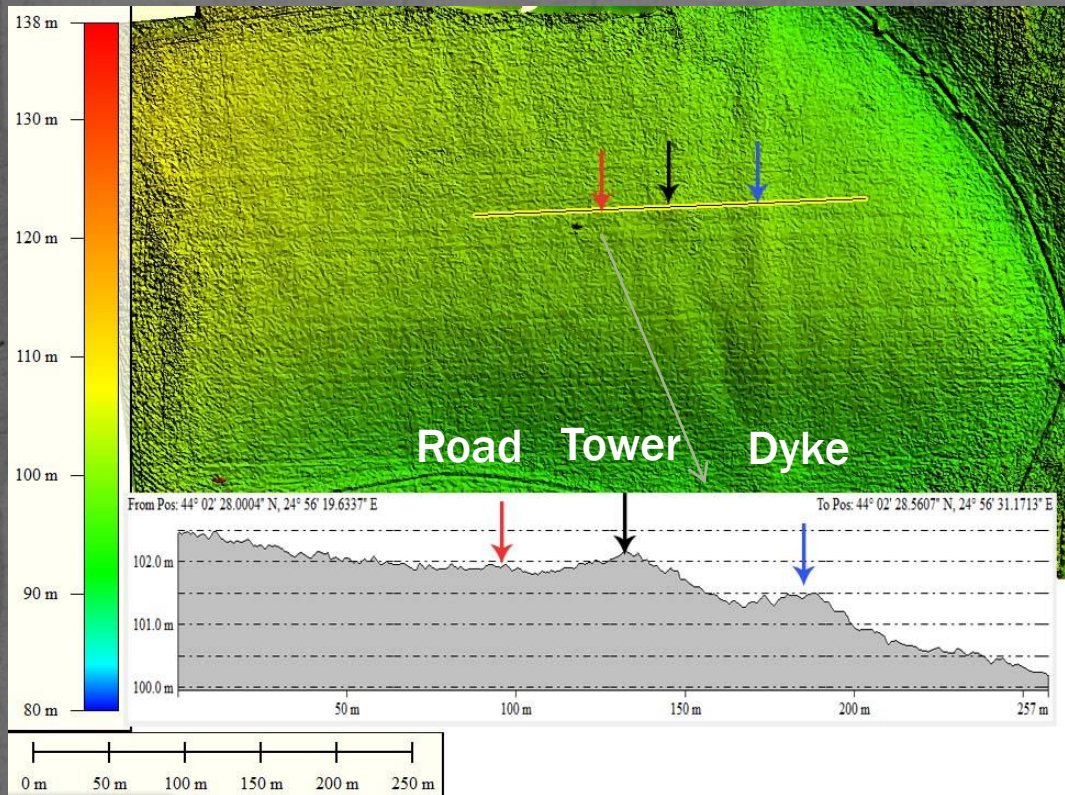
Urlueni forts





# Watch-Towers Secondary Road Network

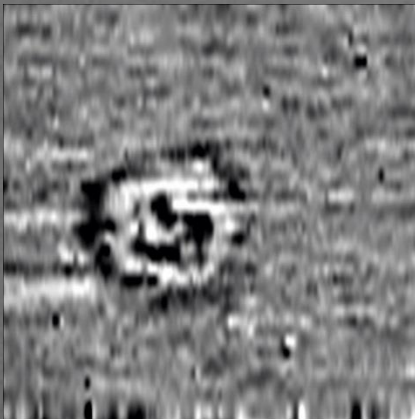
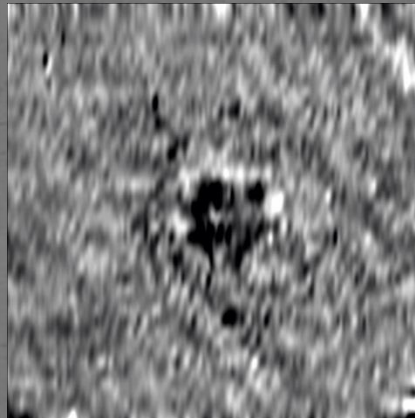
## RESEARCH METHODS AND PRELIMINARY RESULTS DETECTING FEATURES AND STRUCTURES





# RESEARCH METHODS AND PRELIMINARY RESULTS

## DETECTING FEATURES AND STRUCTURES



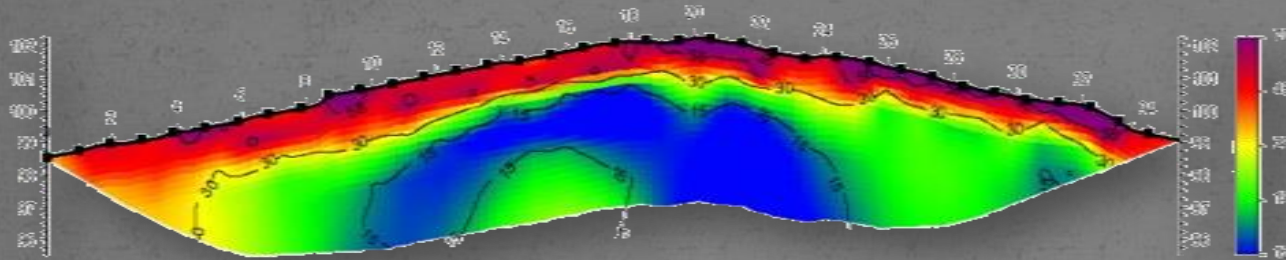
GEOPHISICS  
Magnetic Methods

Watch-Towers

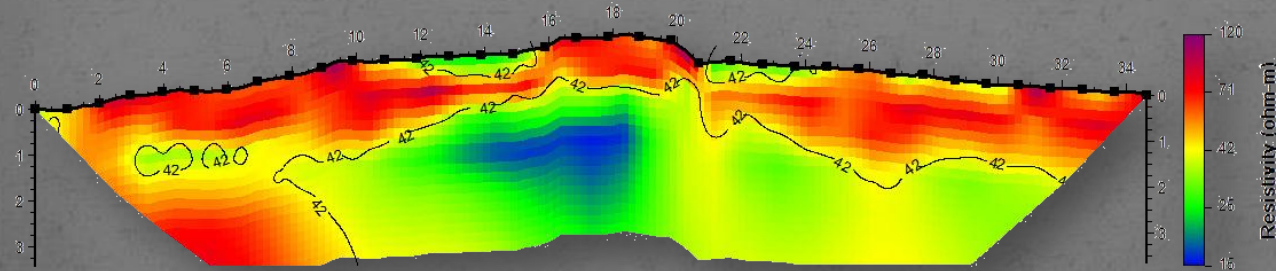


# RESEARCH METHODS AND PRELIMINARY RESULTS

## DETECTING FEATURES AND STRUCTURES



GEOPHISICS  
ERT - Electrical Resistivity  
Tomography





# ARCHAEOLOGICAL CHALLENGES



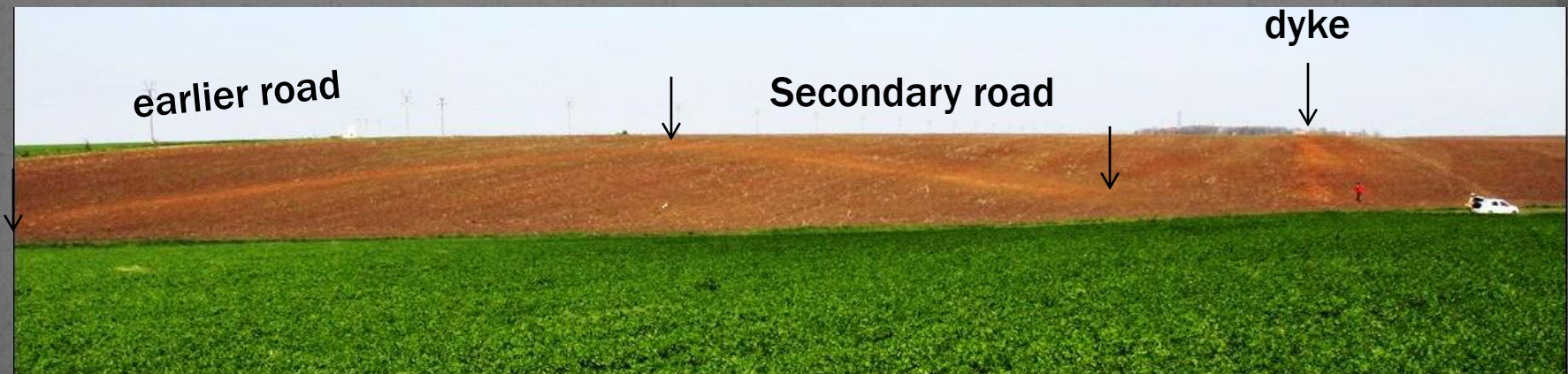
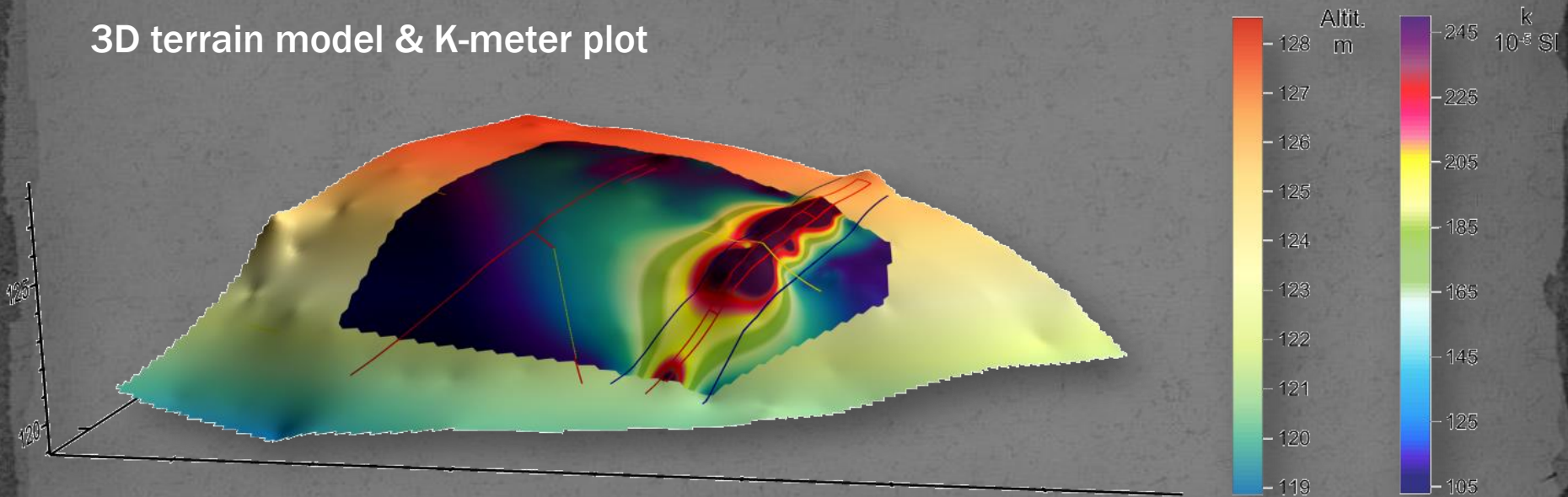
Vitrified dyke



# RESEARCH METHODS AND PRELIMINARY RESULTS

## DETECTING FEATURES AND STRUCTURES

3D terrain model & K-meter plot

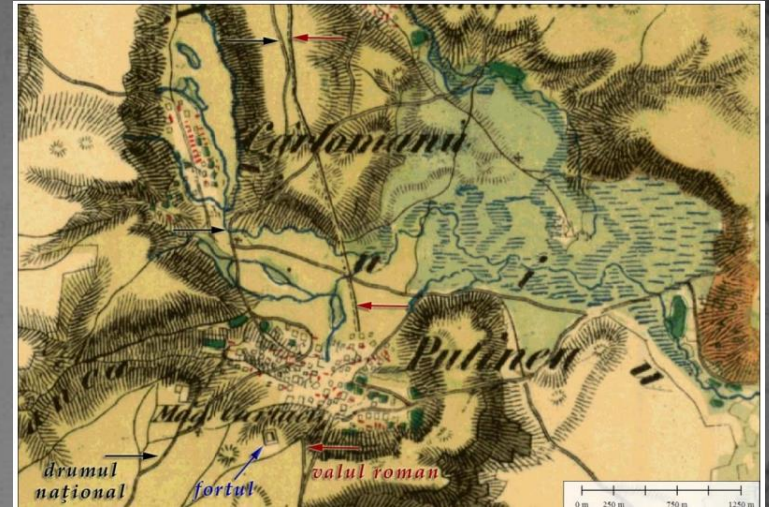






Drillings

Toponymy  
Pottery Survey



Historical cartography

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OTHER METHODS





THANK YOU FOR YOUR ATTENTION  
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<http://www.limes-transalutanus.ro/>