# Micromorphological analysis of roman roads functioning: Evidence of rhythms of human trampling and vehicle traffic (Northeast of France)

Marie-Caroline Charbonnier, Cécilia Cammas

# Micromorphological analysis of roman roads functioning: Evidence of rhythms of human trampling and vehicle traffic (Northeast of France)

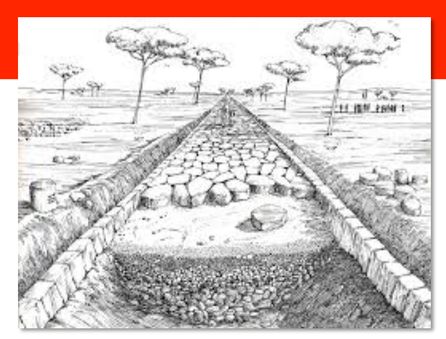
World Archeological Congress 2016

T10-D: Science in archaeology / New contributions to geoarchaeology


**Marie-Caroline CHARBONNIER[1,3], Cécilia CAMMAS[1,2,3]**

(1)*Inrap, (2)UMR 5140 Archaeology of the Mediterranean Societies*

*(3)Unit of Micromorphology Inrap / AgroParisTech*



## Introduction & Objectives

**Roads & Streets**

⇒Elements that structure town planning

⇒Installation, organization, shifting & persistence related to urban dynamic

**Archeological questions**

⇒ Construction / refections techniques ?

⇒ Identification / location of circulation surfaces ?

⇒ Status of the streets & roads ?

Peutinger map (13th cAD)

**Antonin Route (Roman and early medieval)**

**Current studies focus on:**

⇒ The routes and the pattern of the street / roads in urban / rural context (based on historic documents & maps, archaeological sites map)

**Lack of studies on:**

⇒The sedimentary expression of traffic: typical street improvements, trampled layers or layers related to vehicle traffic

**Our objectives are:**

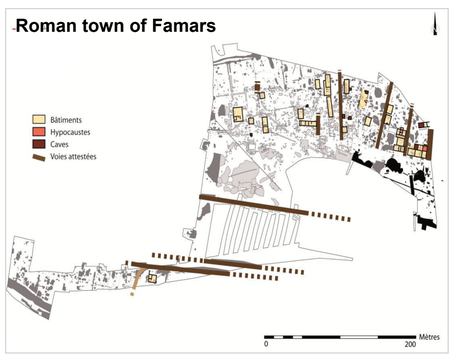
☞ **To identify & characterize roads / streets from the field to the microscopic scale**

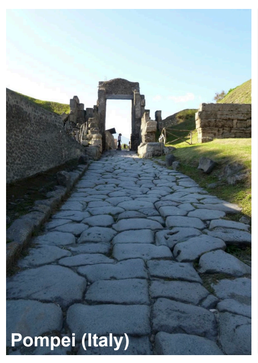
- Intensity / Frequency of trampling or traffic
- Typical pattern of layers & spatial organisation of circulation areas

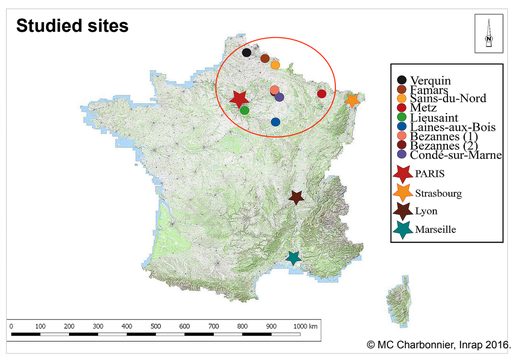
☞ **To specify the anthropogenic activities and the function of these areas**

## Material & Methods

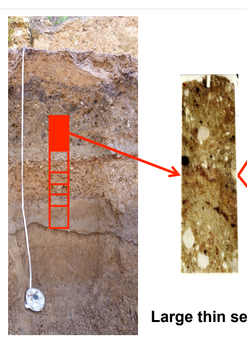
### Roads sections in different contexts (rescue archaeology)



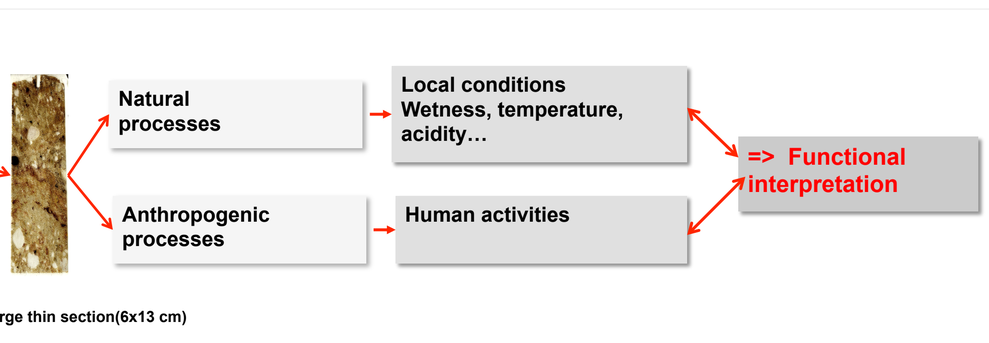




### Method: Stratigraphic analysis from the field to microscopic scale

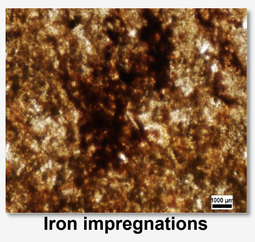


Large thin section(6x13 cm)

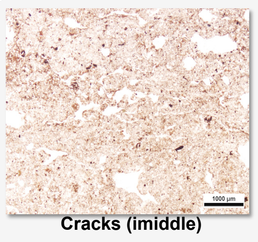



## Results: Diagnostics features of environmental conditions, trampling & passage of vehicles

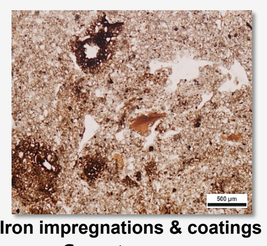
### Features related to local conditions ▸ Degree of wetness / water logging



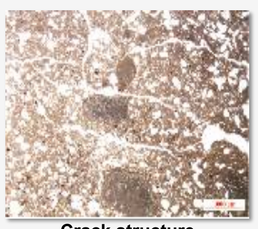
Iron impregnations



Cracks (imiddle)



Iron impregnations & coatings



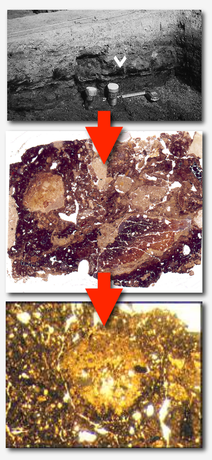
Crack structure

**Iron features**
▸ Poor drainage

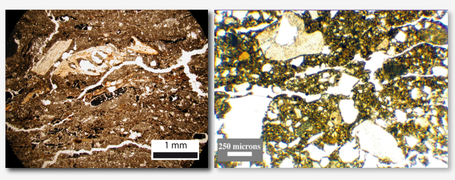
**Cracks**
▸ Compaction,
▸ Wet / dry conditions

### Features related to local circulation ▸ Type & Intensity

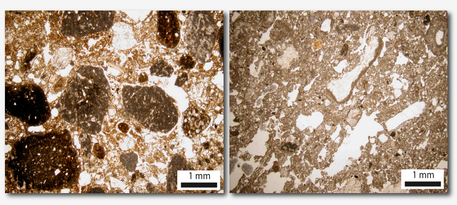
**Hoofed animals**



**Human trampling**



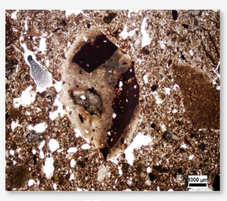

**Passage of vehicles**



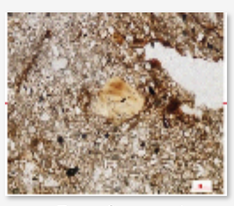

- Intensity / Frequency +

### Components related to human activities in the surroundings areas ▸ Multi activities or areas reserved to traffic

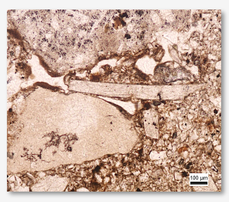
Rocks, ceramic, bones, bricks & tiles…



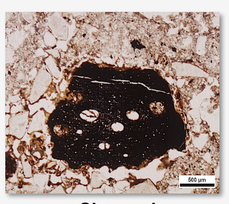
Mortar



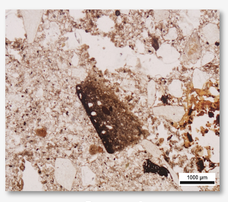
Bone fragment



Splinters of flints



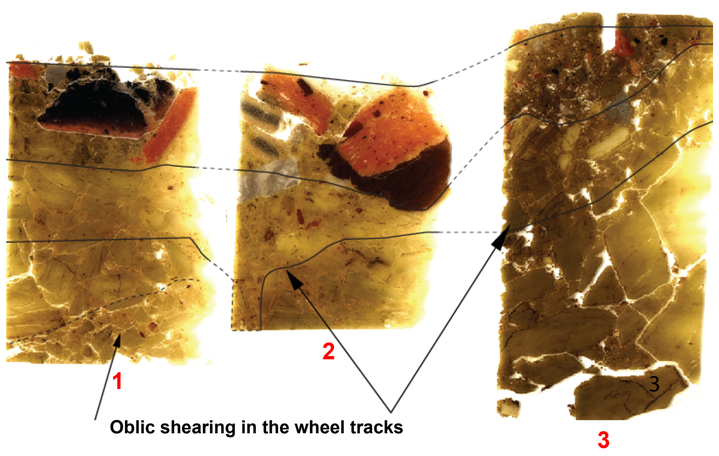
Charcoal

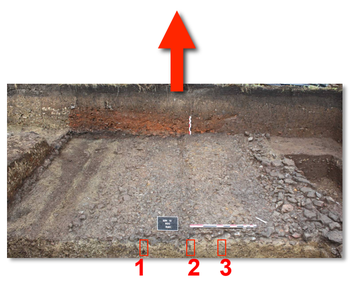


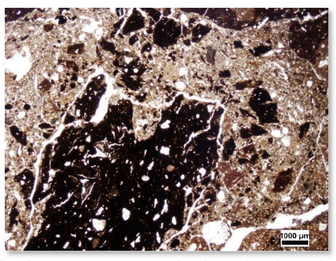
Ceramic

## Results: Selected types of functioning

### Wheel tracks on scraped soil (Sains-du-Nord)

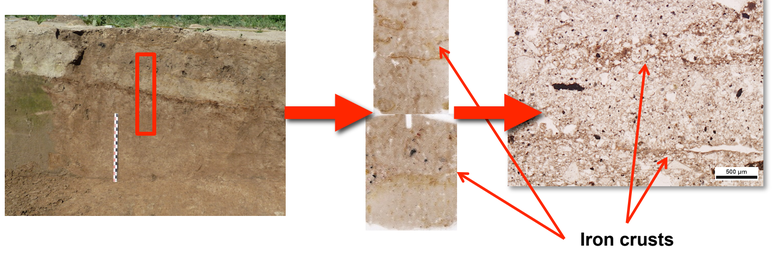


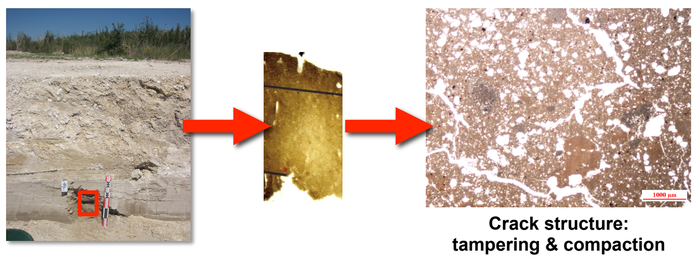



Broken components in the wheel tracks

### Superimposed non constructed circulation areas: Fine surfaces of circulation - Iron crusts (Famars)

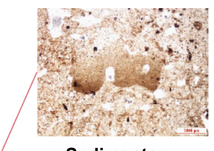



### Thick & compacted traffic layer (Bezannes)

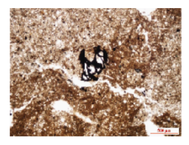


Crack structure: tampering & compaction

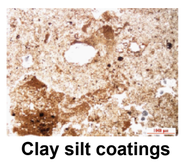
### Ditches on each side of the road: Functioning of the left one

Sedimentary crust

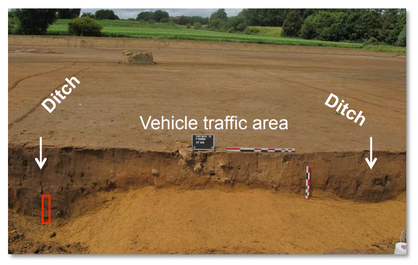


Fragment of seed



Clay silt coatings

Calcitic & clay coatings




**Ditch filling: Washed &clay silt intercalations, clay silt coatings, sedimentary crust**
▸ Action of water (runoff, decantation)

**Few anthropogenic components**
▸ Few activities, area reserved to traffic

## Conclusions

**Field work + micromorphological analysis provide useful informations about the nature of the traffic layers and their formation processes. It shed a new light on these layers, and shows that they should not be considerered as one massive deposit or superimposition of backfills but should be investigated with the same geoarchaeological methods and the same care as others archaeological layers.**

Micromorphology ⇔ Facies: Components and processes ⇔ Ways of construction and functioning ⇔ Relation type of road or street and soils ⇔ Status of traffic layers in the urban fabric ⇔ Direct relation with the dynamics of urbanization