Spatio-temporal patterns in absent/reduced hypoconulids in mandibular third molars amongst domestic cattle in north-west Europe: a preliminary investigation and some speculations.

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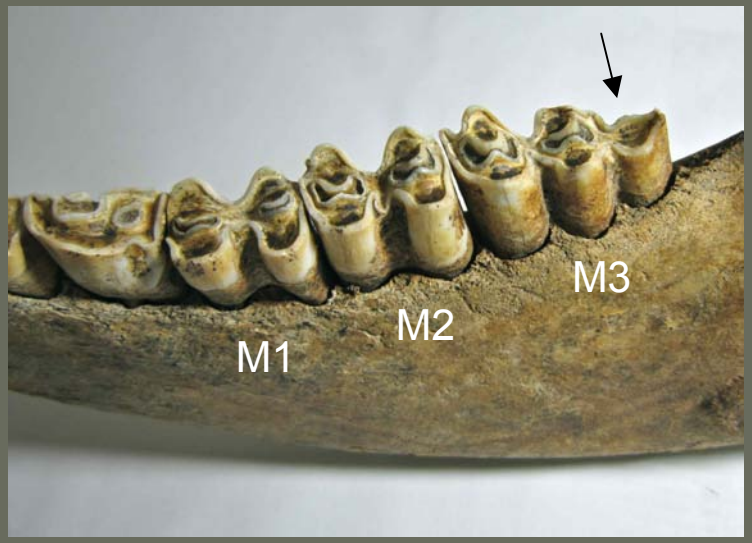
What are we talking about ?

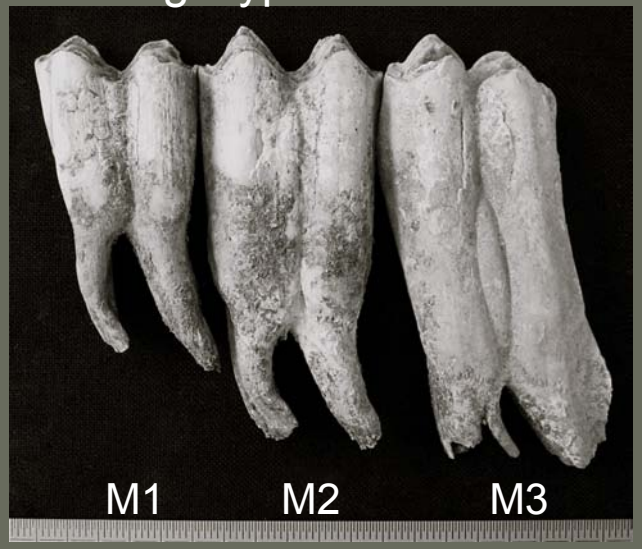
- In Bovids the third molar normally consists of three distinct columns, of which the distal one is small but still makes some contribution to the occlusal surface of the tooth
- In a small proportion of cases, the distal column (anatomically, the *talonid* or *hypoconulid*) fails to develop completely or at all, sometimes being represented only by a small area of root coalescent with the roots of the adjacent column

(O'Connor 2004 : 119)

Normal LM3



Missing Hypoconulid LM3



Lyon - rue des Tuileries - 5th Century BC

Corent (Puy-de-Dôme)
2nd Century BC

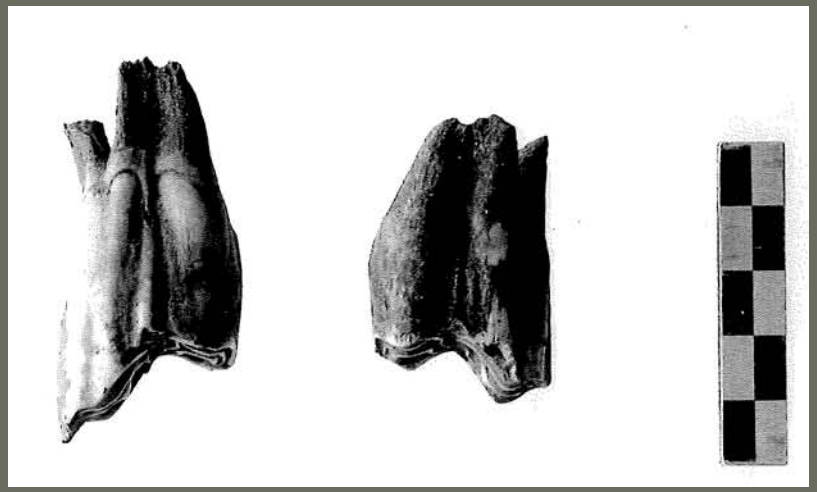
Val de Reuil (Eure) - 2nd Century BC

Roanne (Loire)
1st Century AC

Brandes-en-Oisans (Isère)
14th Century AD

Ludna (Rhône)
1st Century AC

Love's Farm; Romano-British
© Ian Baxter
http://archaeologydataservice.ac.uk



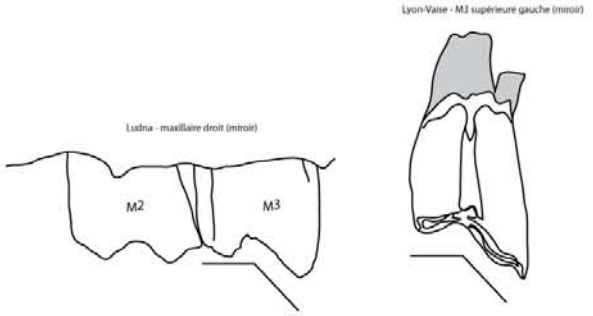
Lyon - Horand II
5th century BC

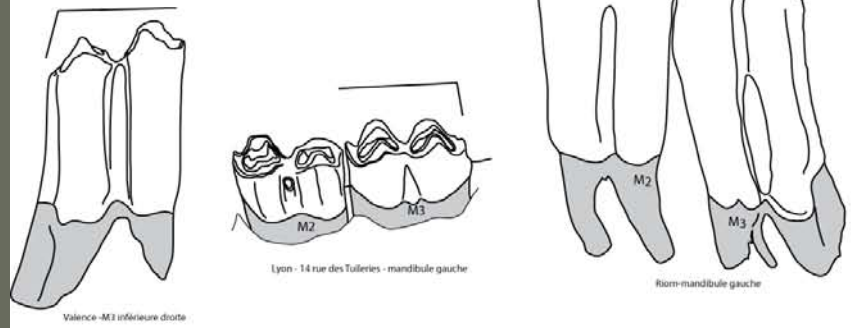
Köln - Janstrasse
1st Century AC
Berke 1997 : *Anthropozoologica 25-26*

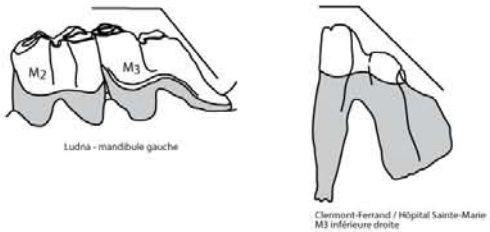
Typology

Type 3 : $M^{\underline{3}}$ showing different wear stage from anterior to posterior side

Type 3 : $M^{\underline{3}}$ présentant une usure différentielle importante entre la partie antérieure et la postérieure



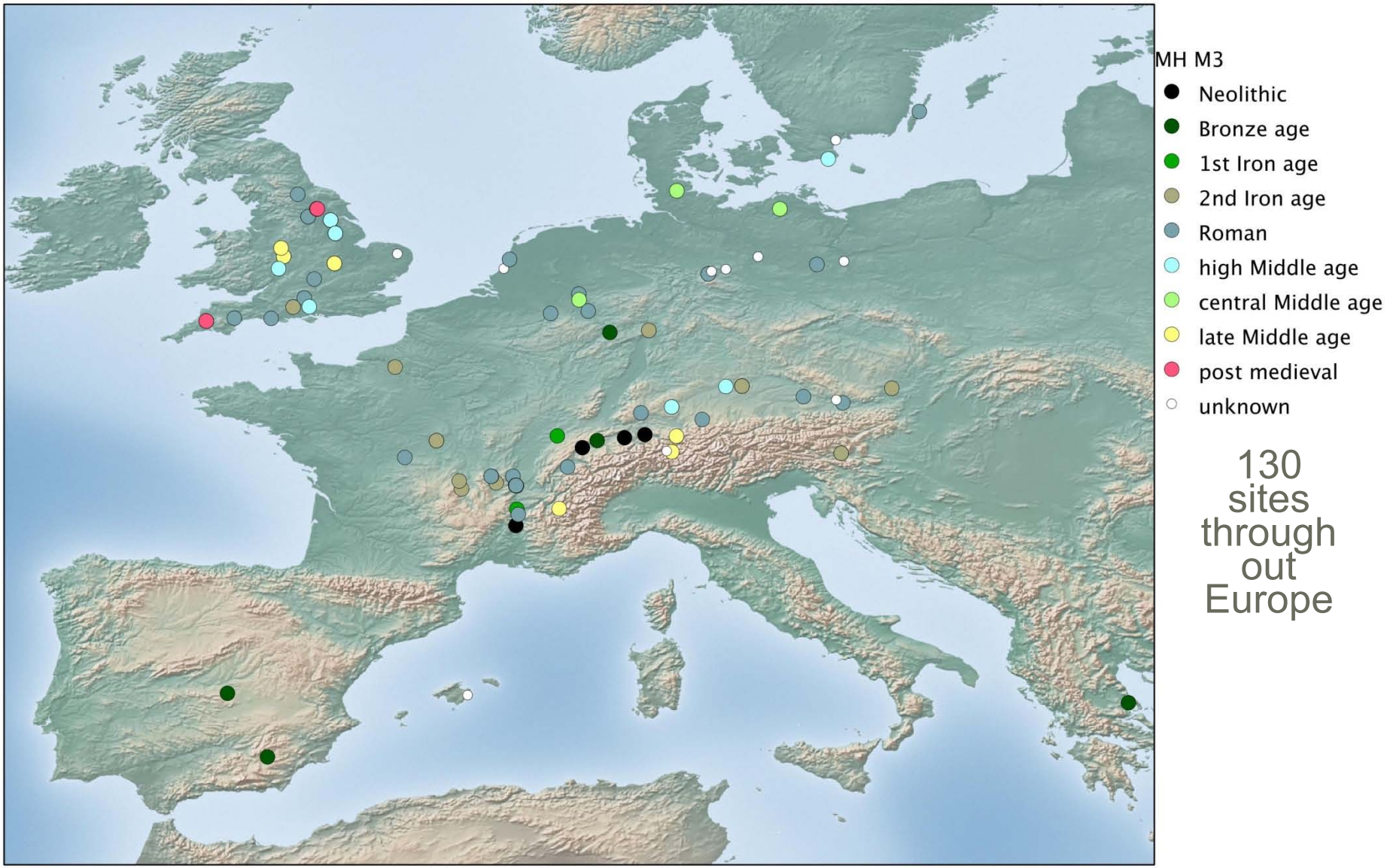




Type 1 - M3 bilobée : hypoconulide totalement absent
*Type 1 - bilobate M3 : hypoconulid totally missing = **MH LM3***

Type 2 - hypoconulide atrophié ou présentant une usure anormale
Type 2 - reduced hypoconulid or showing abnormal wear

- Corpus -


MH M3
Neolithic
Bronze age
1st Iron age
2nd Iron age
Roman
high Middle age
central Middle age
late Middle age
post medieval
unknown
130 sites through out Europe

But, for the moment…

- We just have recorded sites where we knew this condition was present because…
  - We did the study
  - It has been published
- BUT, the condition is not systematically reported:
  - where it is present there is often no indication of prevalence.
  - if the condition is not mentioned, it is not clear if it was absent or just not or recorded or reported in the publication (it may be present in the archive or grey literature)

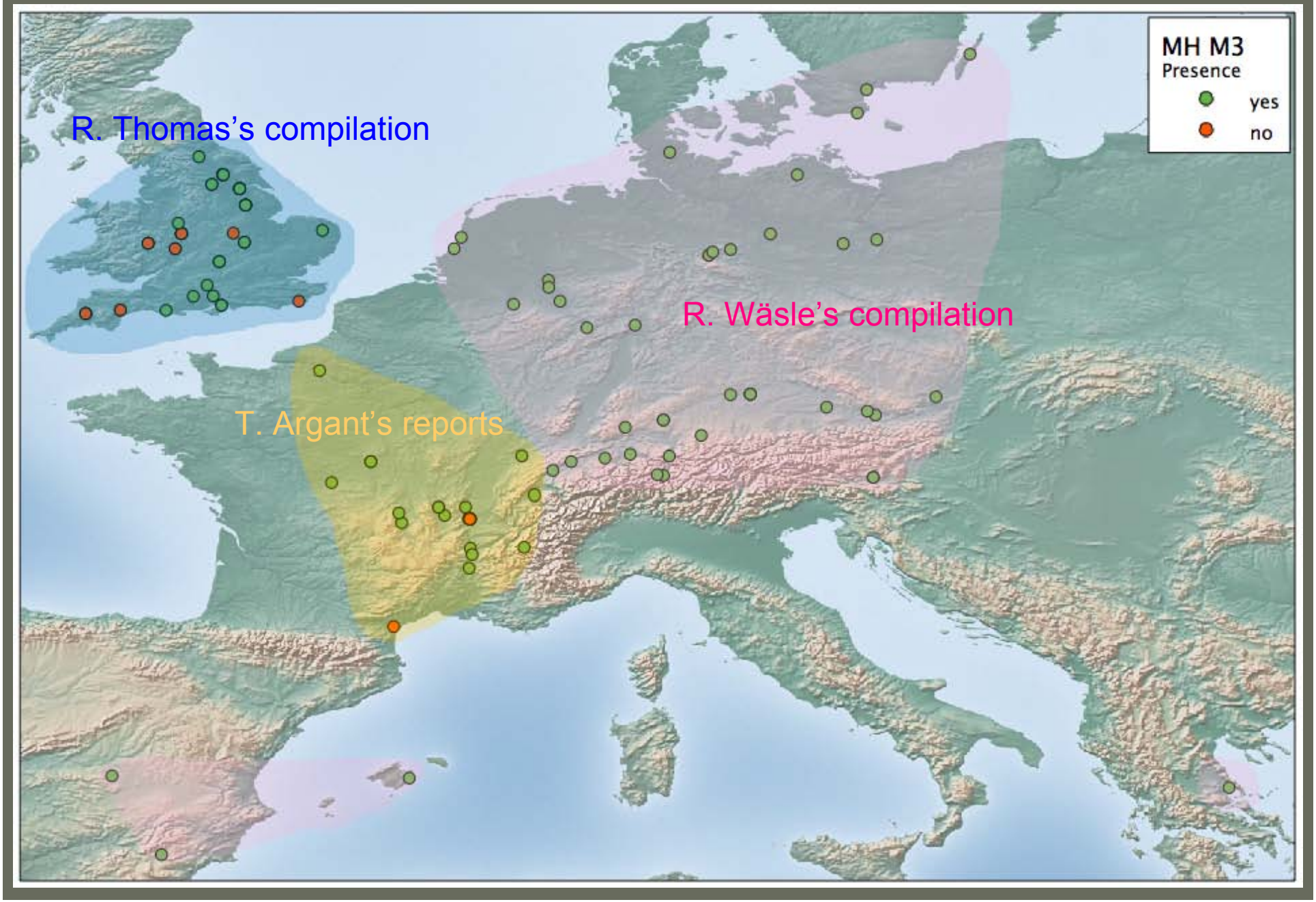
So, currently…

We just can describe the evidence…

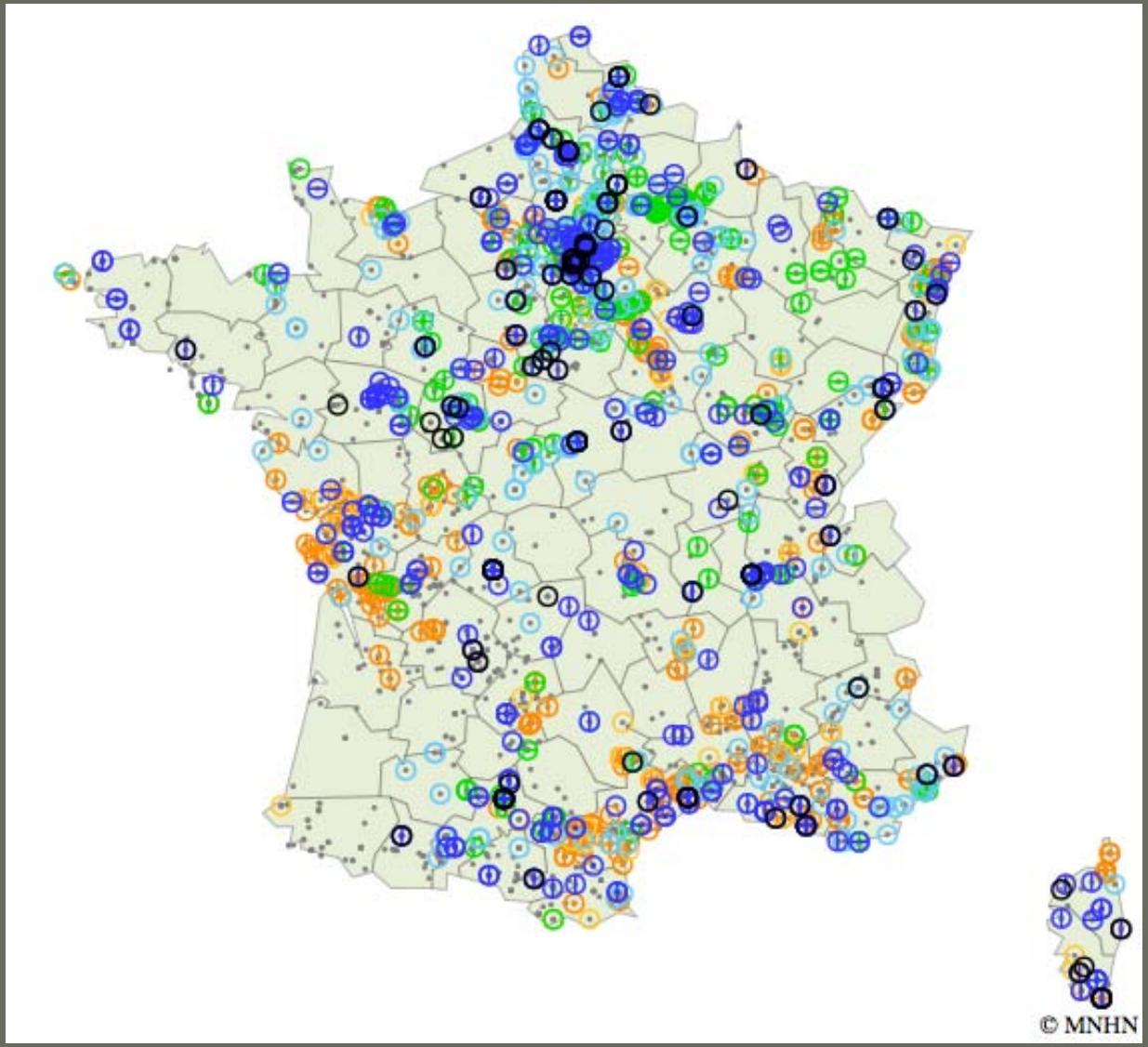
…and speculate on the patterns observed

What do our preliminary investigations suggest?

Problem with the sources



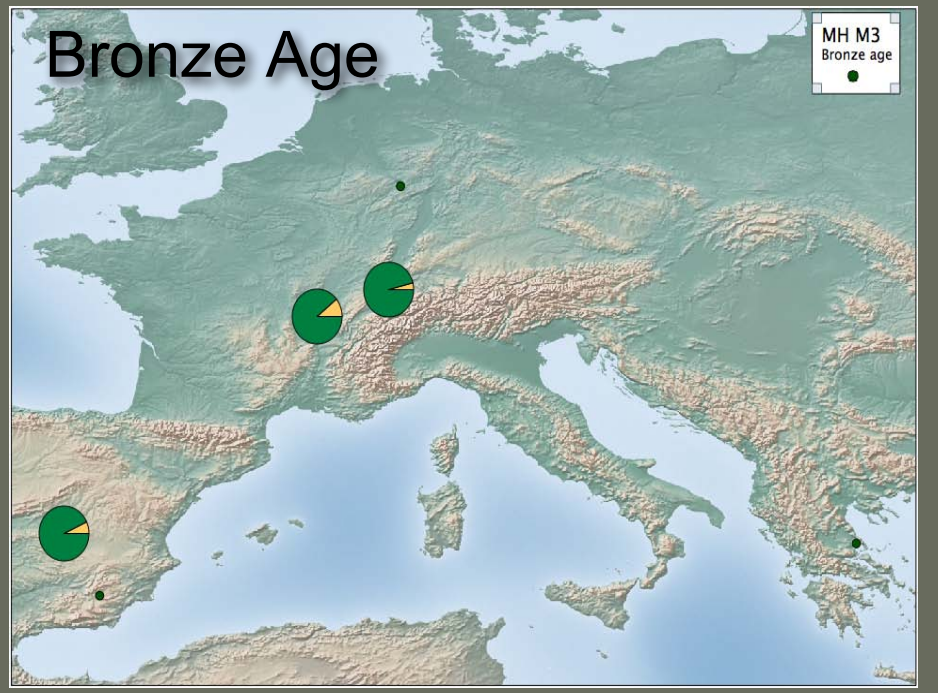
Potentiality



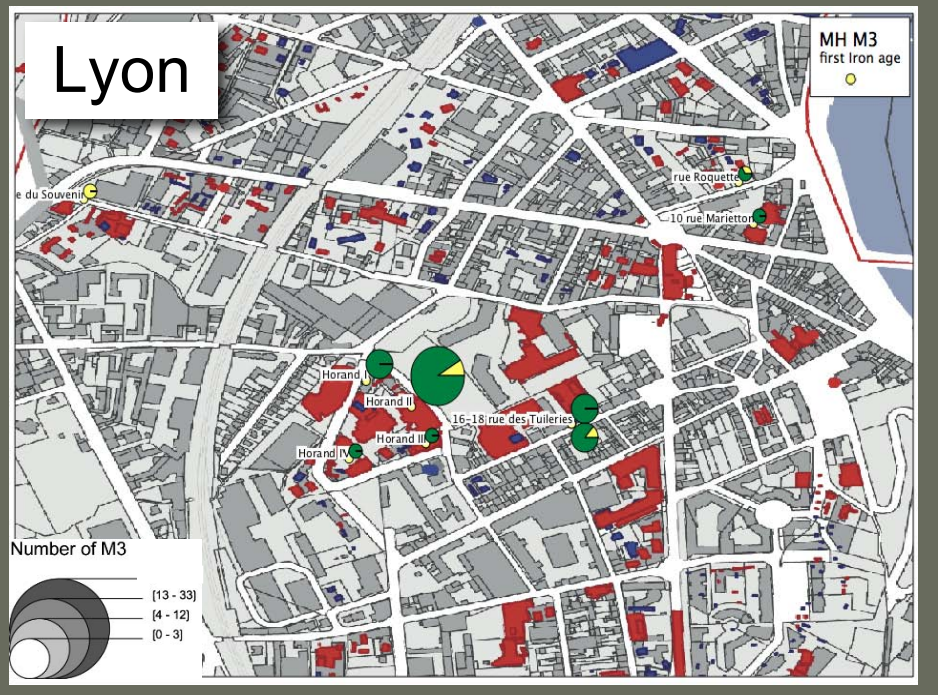
http://inpn.mnhn.fr

- **Néolithique**
  - ancien
  - moyen
  - final
- **Age du Bronze**
- **Age du Fer**
  - Hallstat
  - La Tène
- **Antiquité**
- **Moyen Age**
  - Haut Moyen Age
  - Moyen Age central
  - Bas Moyen Age
- **Temps modernes**

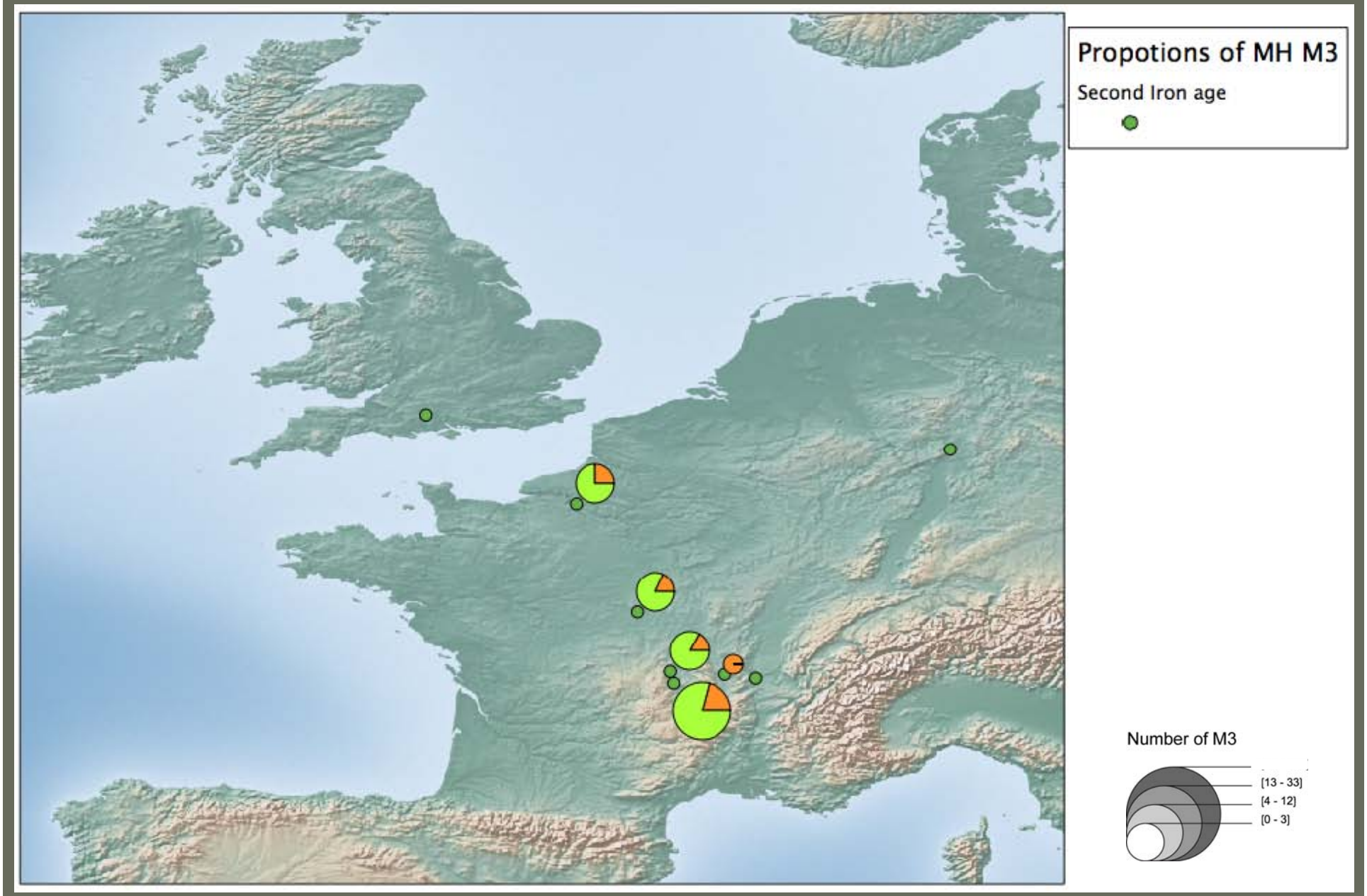

Neolithic
MH M3
Neolithic


Bronze Age
MH M3
Bronze age

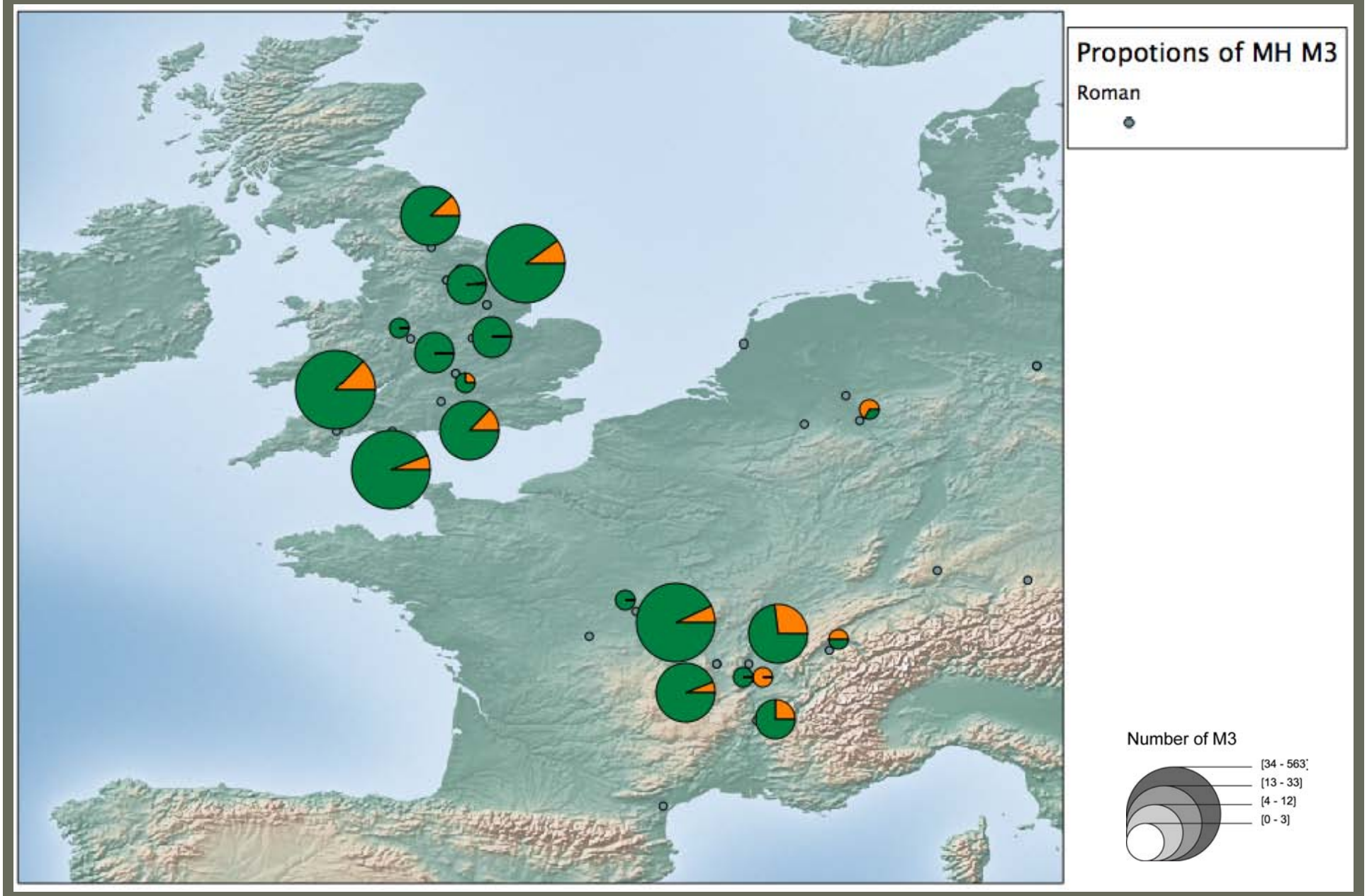

First Iron Age - Hallstatt
MH M3
First Iron age

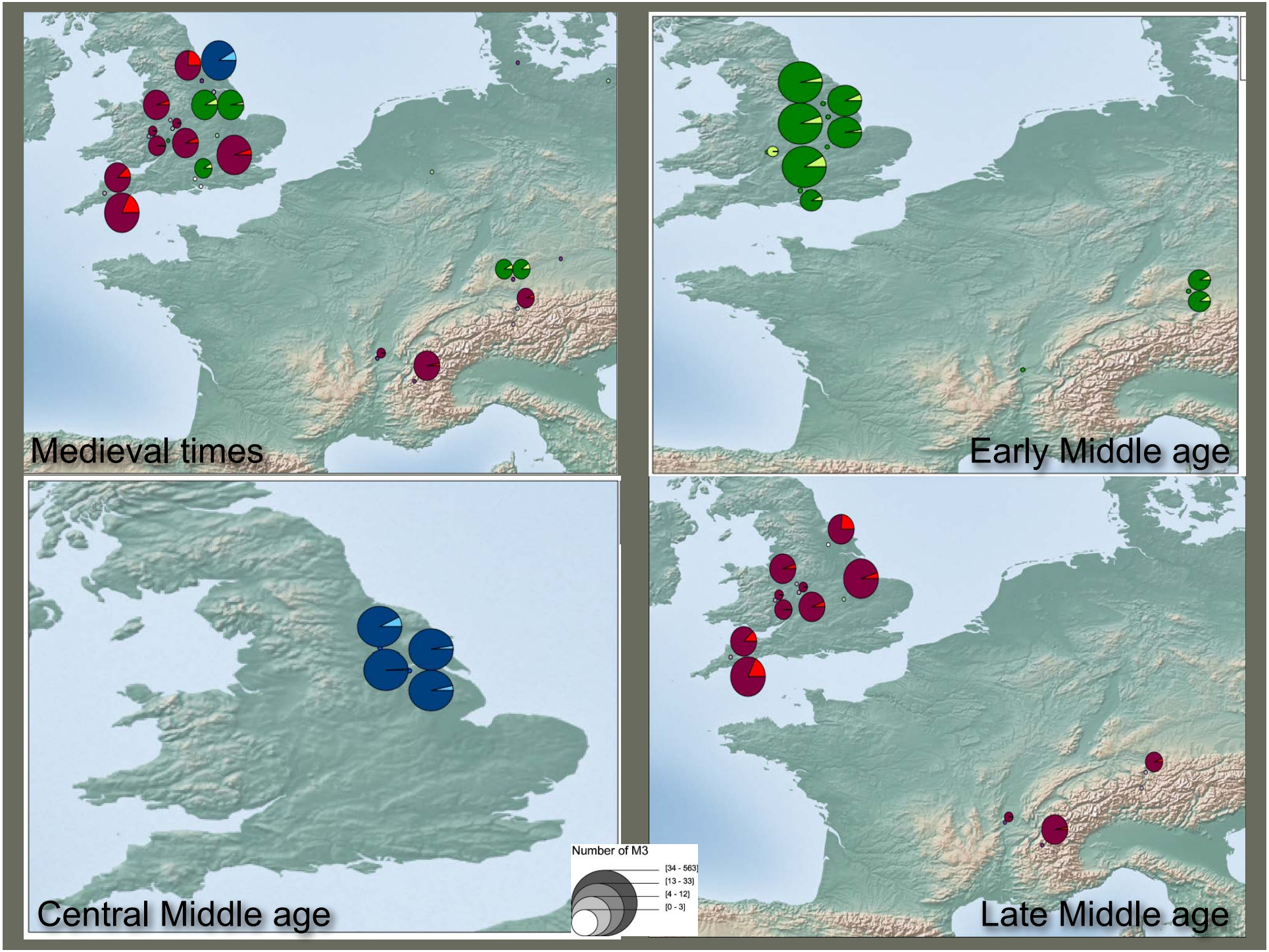

Lyon
MH M3
first Iron age
rue Roquette
10 rue Mariette
Horand I
Horand II
Horand III
Horand IV
16-18 rue des Tuileries
Number of M3
[13 - 33]
[4 - 12]
[0 - 3]

Second Iron age

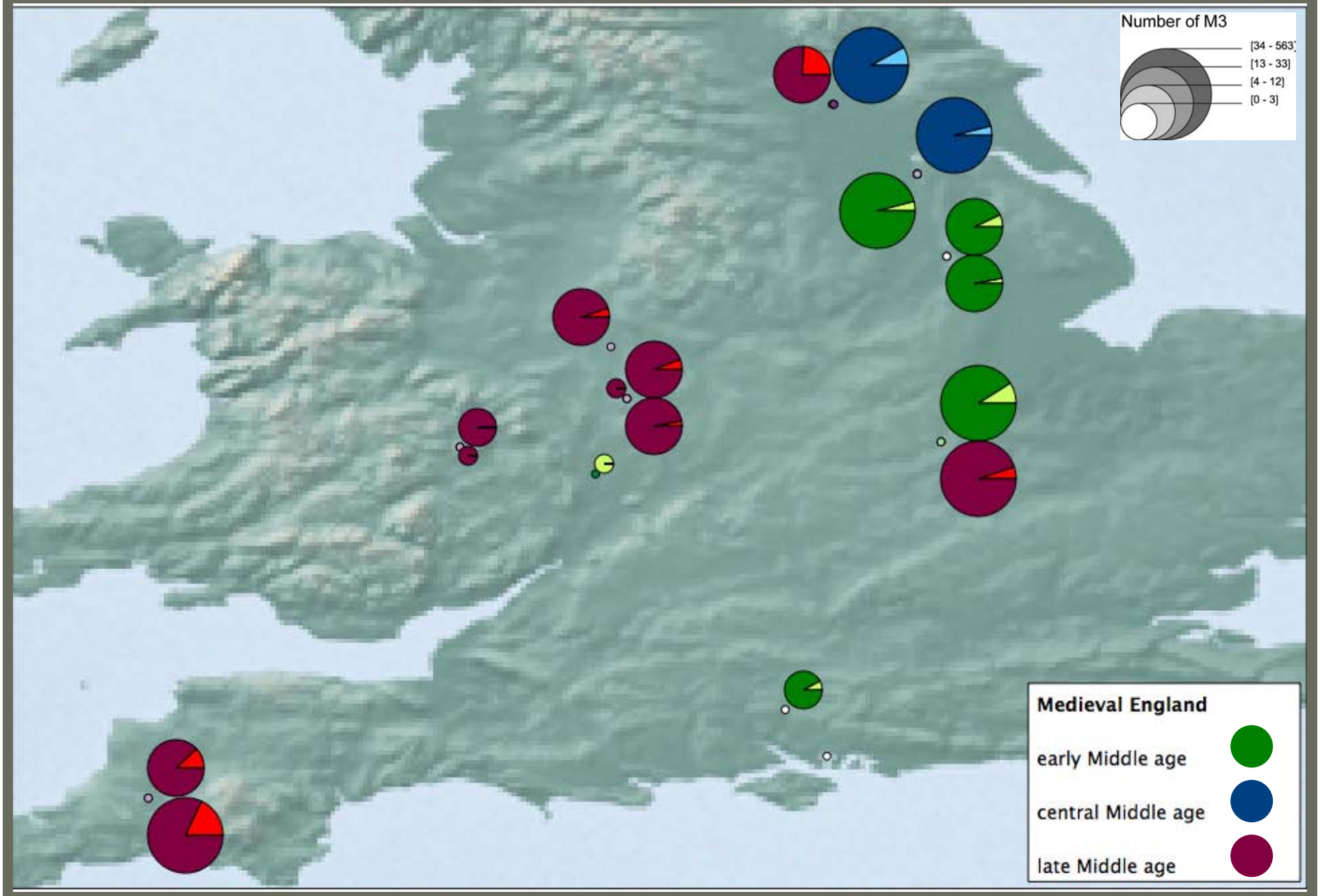


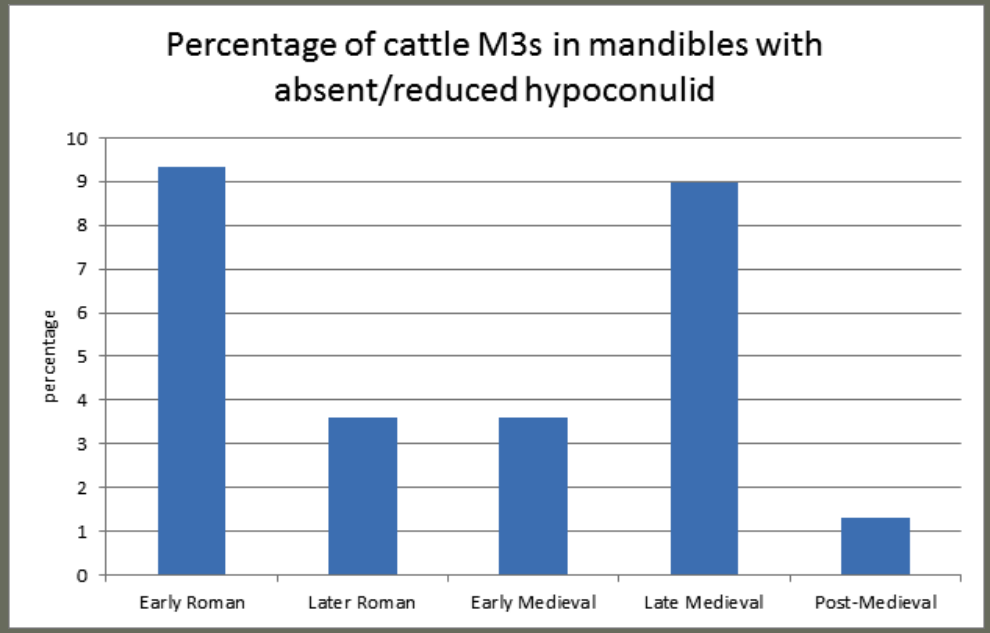
Roman times

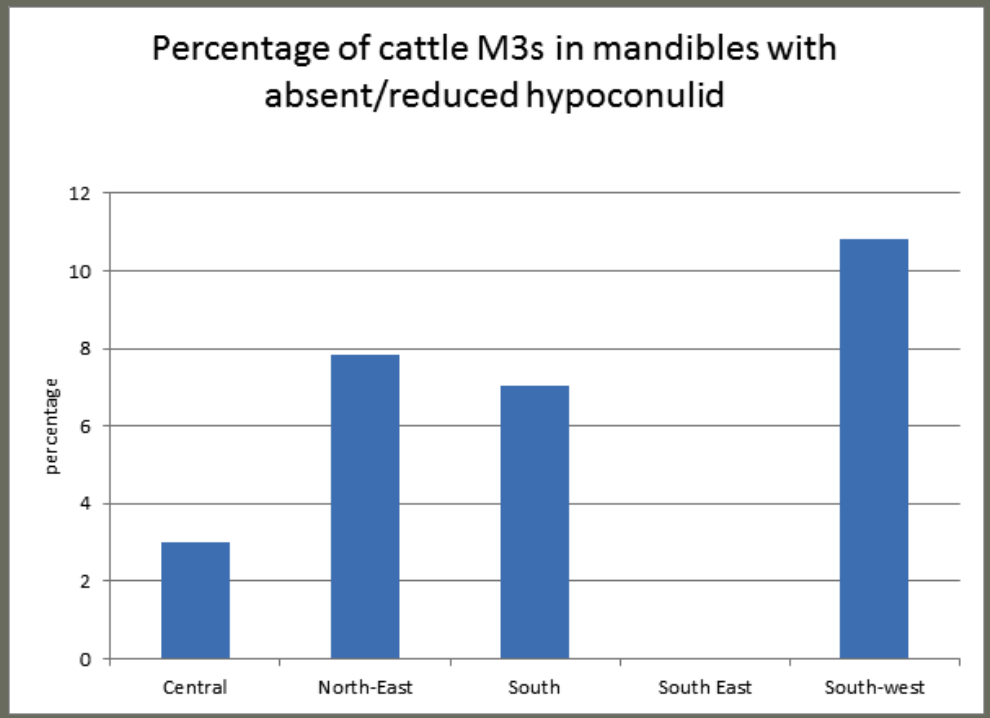



Medieval times
Early Middle age
Central Middle age
Late Middle age
Number of M3
[34 - 563]
[13 - 33]
[4 - 12]
[0 - 3]

Focus on medieval England



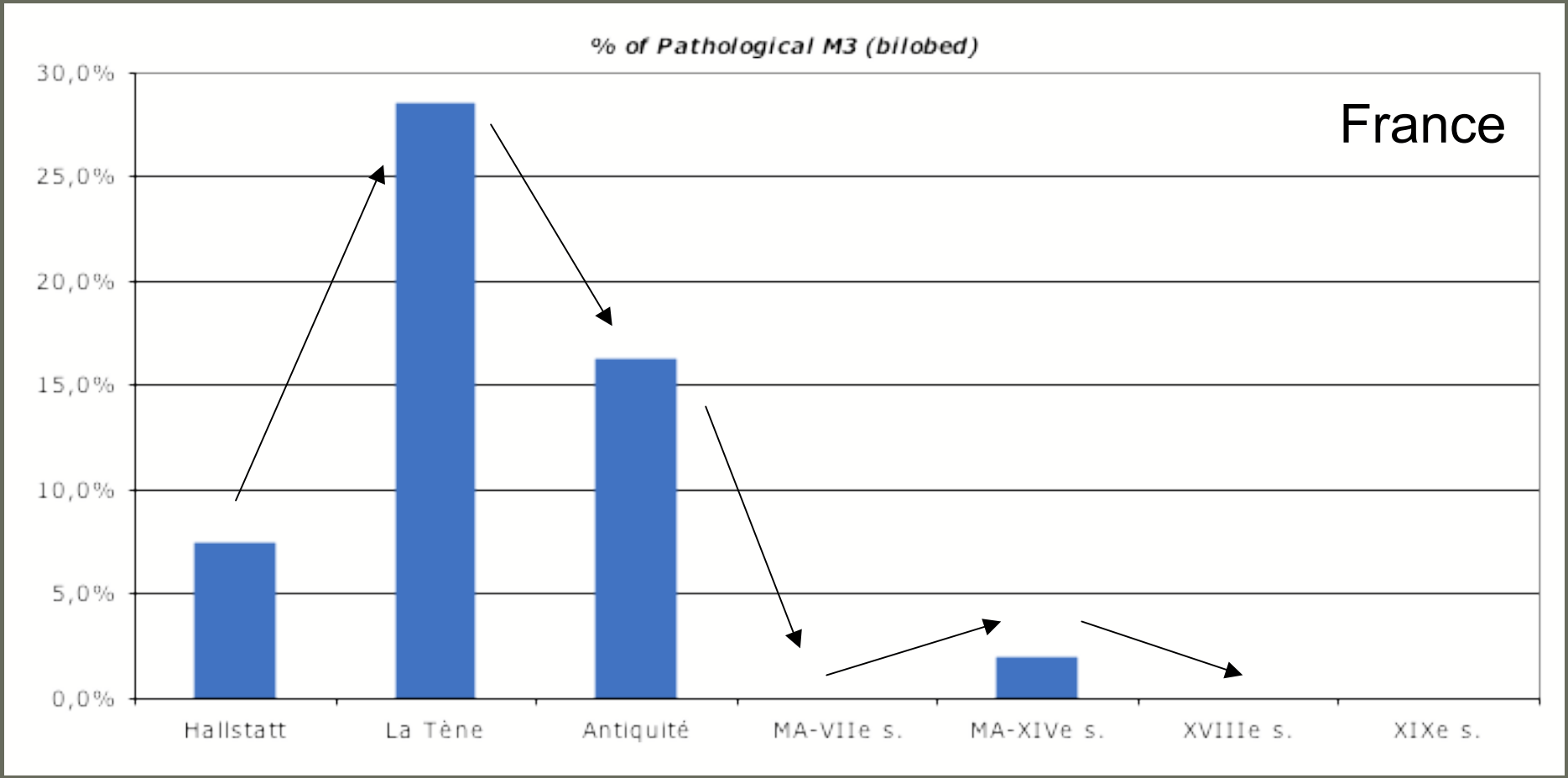


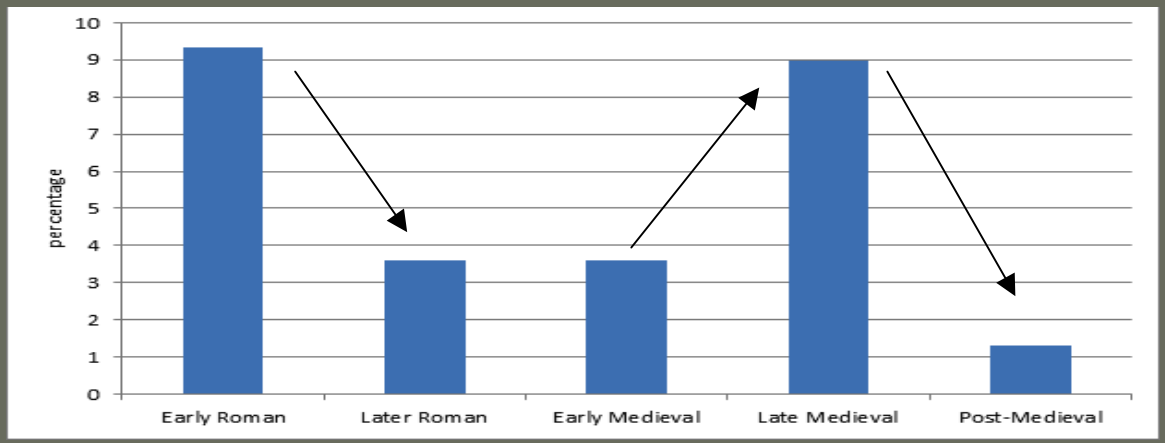


England

Bobs Wood, Hinchingbrooke, Cambridgeshire
© Ian Baxter

prevalence linked with type of site ?
rural/urban


% of Pathological M3 (bilobed)
France
30,0%
25,0%
20,0%
15,0%
10,0%
5,0%
0,0%
Hallstatt
La Tène
Antiquité
MA-VIIe s.
MA-XIVe s.
XVIIIe s.
XIXe s.


England
percentage
10
9
8
7
6
5
4
3
2
1
0
Early Roman
Later Roman
Early Medieval
Late Medieval
Post-Medieval

Conclusions and speculations

- ✓ The collection of data is just at the beginning and will require a lot of work to synthesise
- ✓ The MH M3 seems to be more prevalent during the Iron Age (2nd century AD) and late Medieval times

→ Husbandry : cattle were maintained in smaller breeding groups, so that an uncommon genetic trait was more likely to be expressed in at least some herds (O'Connor).

Chillingham herd

- Feral herd since the late medieval period
- Small herd size (50-100)
- Highly inbred
- Frequency of MH M3: 23%
- Also high frequencies of acetabular notches and absent second premolars.

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- ✓ The collection of data is just at the beginning and will require a lot of work to synthesise
- ✓ The MH M3 seems to be more prevalent during the Iron Age (2nd century AD) and late Medieval times

- → Husbandry : cattle were maintained in smaller breeding groups, so that an uncommon genetic trait was more likely to be expressed in at least some herds (O'Connor).
- → Genotype : the prevalence of this trait may be useful as an indicator of genotype to be followed throughout Europe and time.

Thank you for your attention !

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University of Leicester

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