



European Acheuleans

Northern v.s. Southern Europe: Hominins, technical behaviour, chronological and environmental contexts

International conference

National Museum of Natural History, Paris, France

November 19th-20th-21st, 2014

Journée MNHN 2015 - Relations Hommes/climat au Pléistocène

Palaeoenvironmental contexts of Acheulean occupations from Northern France

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3 IPH, MNHN

4 INRAP, Amiens

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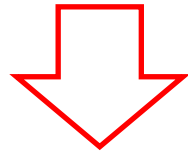
P. ANTOINE, P. AUGUSTE,
J.-J. BAHAIN, P. COUDRET,
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C. FALGUÈRES, M. FONTUGNE,
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A.-M. MOIGNE, A.-V. MUNAUT,
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*Paléoenvironnements
pléistocènes
et peuplements paléolithiques
dans le bassin de la Somme
(nord de la France)*

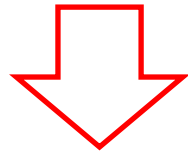
Bulletin de la Société préhistorique française 2003, tome 100, n° 1, p. 5-28

2003 Synthesis on the Somme valley basin:

Palaeoenvironmental contexts of Acheulean settlements = **Climatic transitions** (Late or Early Glacial)



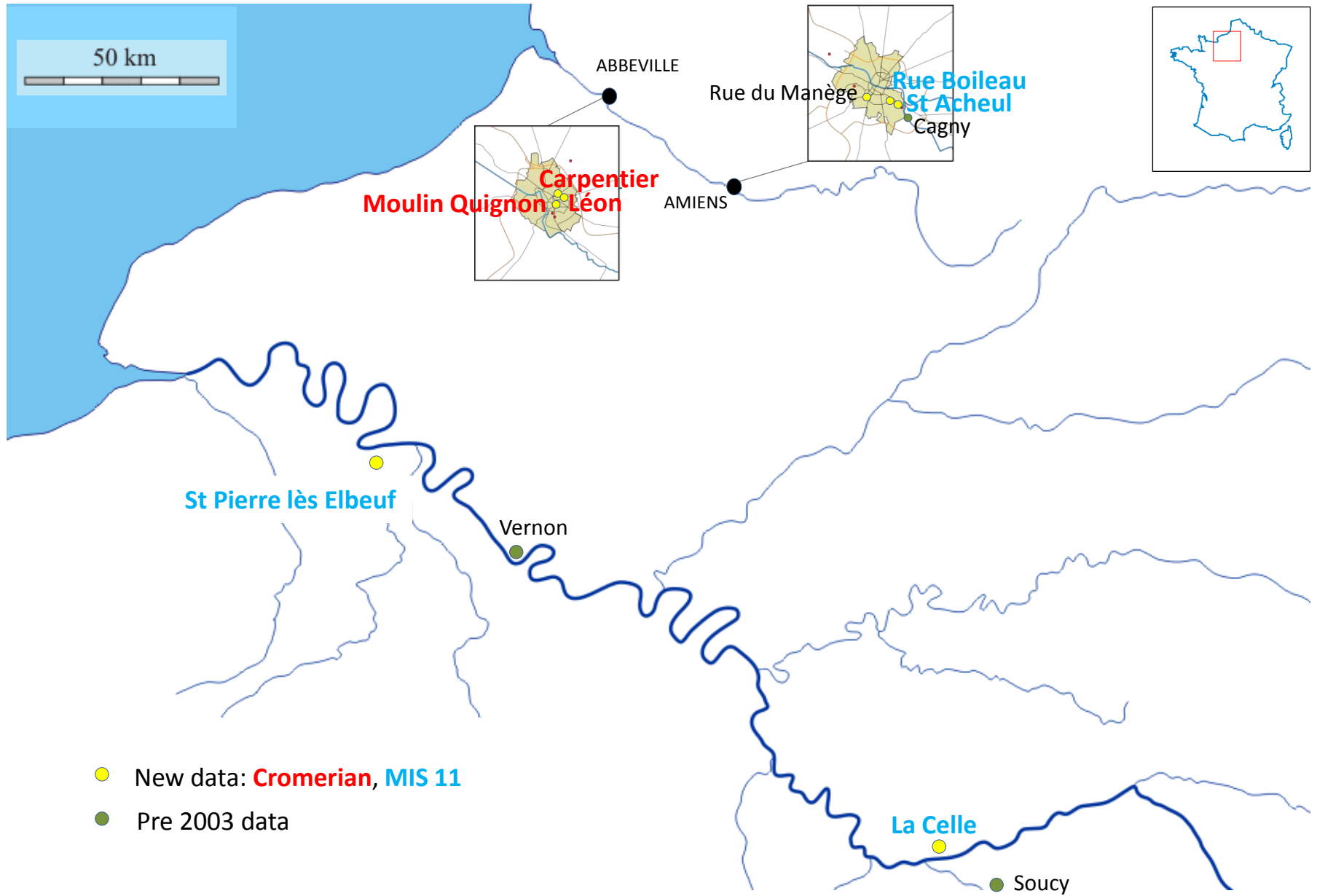
Typical **interglacial** deposits and associated settlements are not preserved due to **erosive** processus ?



Focus on interglacial
Search for tufa and malacological faunas

New field works + reappraisal of old collections

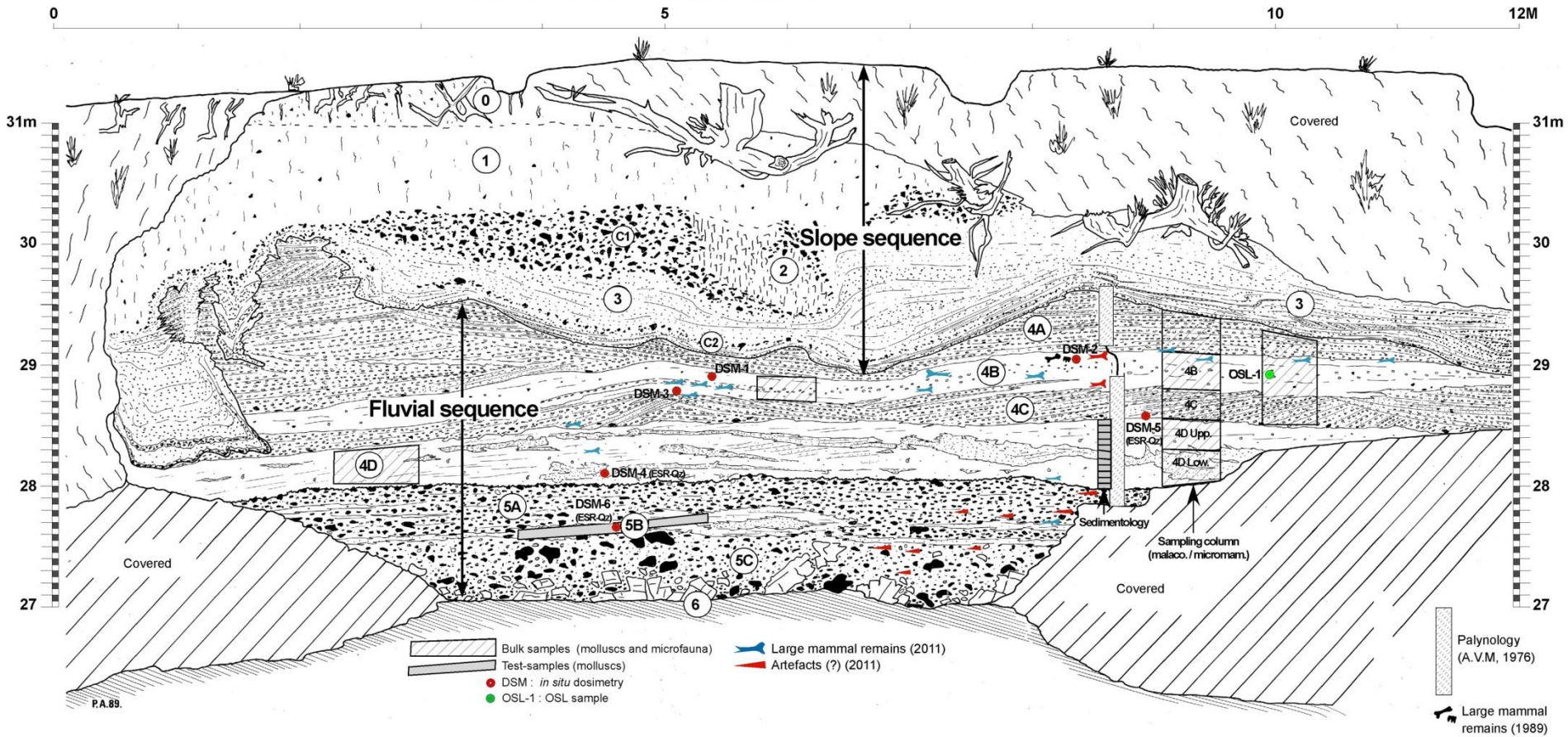
2014, what news on palaeoenvironments of Acheulean populations from Northern France ?



Sites with evidence of Acheulean settlements

Oldest sites : End of the Cromerian complex

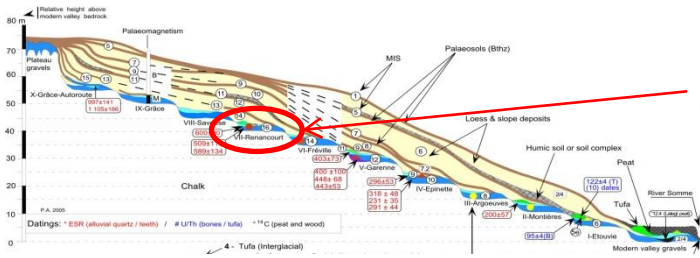
Abbeville "Carrière Carpentier" 1989-2011



New investigations at Carrière Carpentier: multidisciplinary approach

Carrière Carpentier

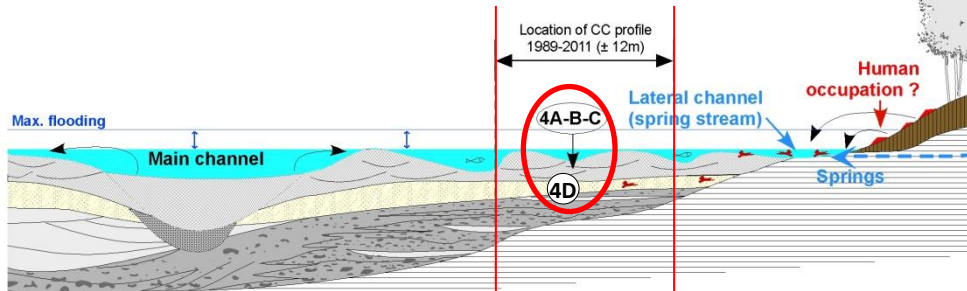
Alluvial formation VII of the Somme river system



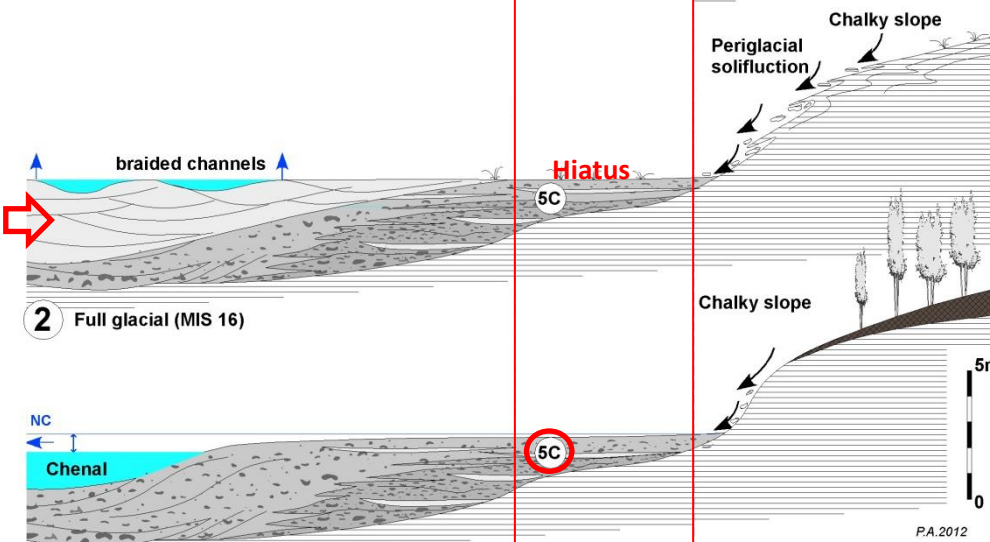
Unit 4:

calcareous sandy silts and oncolithic sands

ESR/ESR-AU mean age (615 ± 94 ka)



4 INTERGLACIAL (phase 2) (MIS 15)



2 Full glacial (MIS 16)

1 Early-glacial (MIS 17/16)



HIATUS = typical periglacial alluvial formation (braided river gravels), during the coldest part of MIS 16 (ca. 630-650 ka).

Unit 5C: ESR quartz age (600 ± 90 ka)

beginning of MIS 16 at about 670-700 ka

Interglacial

Pleniglacial

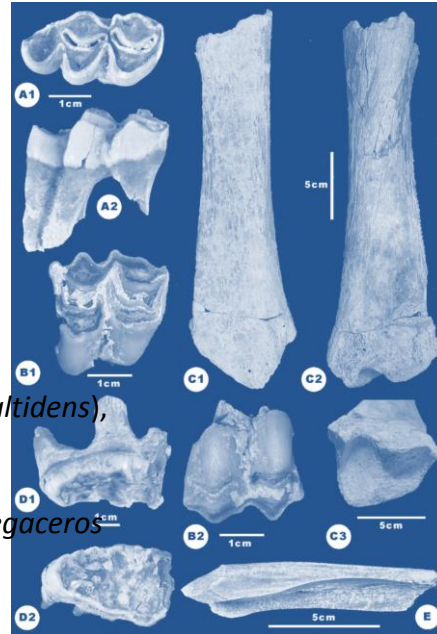
Early Glacial

Carpentier: Unit 4

Large Mammals:

Unit 4D

- Mammuthus meridionalis*,
- Palaeoloxodon antiquus*,
- Stephanorhinus hundsheimensis*,
- Hippopotamus incognitus*,
- Sus scrofa priscus*,
- Equus of stenonian type (Equus cf altidens)*,
- Equus mosbachensis*,
- Homotherium latidens*,
- Megaloceros verticornis* (¼ *Praemegaceros verticornis*),
- Cervus cf elaphus*,
- Bison* sp.,
- Bos primigenius*.



Unit 4B

- Stephanorhinus kirchbergensis* (¼ *Dicerorhinus mercki*),
- Stephanorhinus hundsheimensis*,
- Trogotherium cuvieri*,
- Ursus deningeri*,
- Hyenidae,
- Cervus cf. elaphus*,
- Capreolus capreolus*,
- Mustela nivalis*,
- Oryctolagus* sp.

Forested landscape + marshy zones
Temperate and wet climate.

Best analogues:

- interglacial fauna from Pakefield (U.K.), dated from MIS 17 or 15 (Stuart and Lister, 2001; Parfitt et al., 2005),
- main level of Mosbach in Germany (Brüning, 1980), coeval to the Mauer lower sands dated at ~ 600 ka

Micromammals, Amphibians & Reptiles : 12 species

Lagomorphs (*Oryctolagus* sp.),

Rodents

Allocrietus bursae.

Arvicola cantiana/mosbachensis,

Myodes cf. *glareolus*,

Pliomys cf. *lenki*.

Microtus cf. *gregaloides*,

Insectivores

Sorex minutus,

Sorex cf. *araneus/coronatus*,

Talpa cf. *minor*,

Amphibians (*Bufo* sp.)

Reptiles (Testudines indet.),

Serpentes (cf. *Coluber* sp.).



After MIS 19, before MIS 12

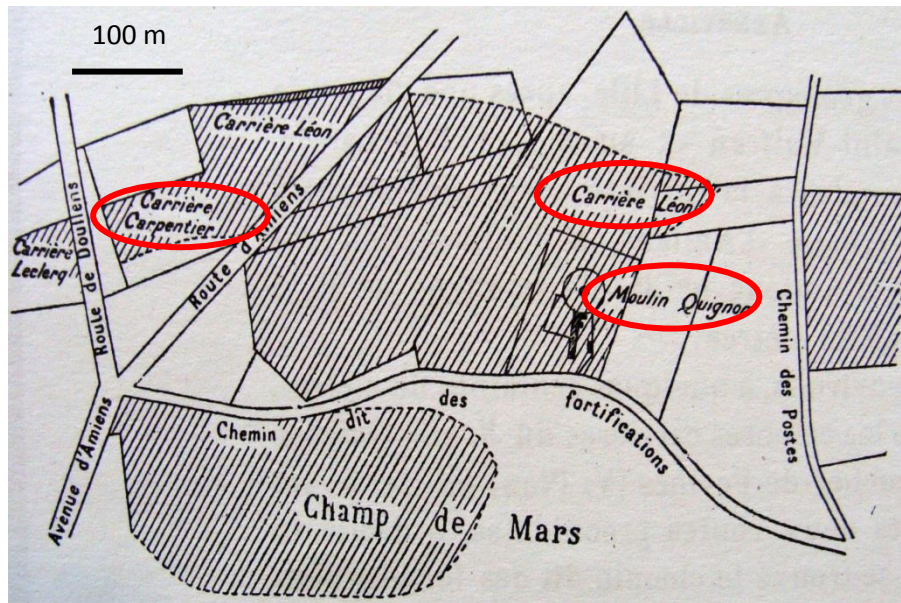
Forested landscape + wet meadows +
more open and cold habitats.
Temperate and relatively humid climate

MIS 15

Abbeville:
Malacological record from the
same alluvial formation,
Carpentier, Léon, Moulin Quignon



Collection Boucher de Perthes, IPH, MNHN Paris



Carpentier

- Bithynia troschelii*
- Valvata picinalis*
- Pisidium henslowanum*

Léon

- Bithynia troschelii*
- Radix* sp.
- Valvata cristata*
- Pisidium henslowanum*
- Pisidium nitidum*
- Pisidium subtruncatum*

Moulin Quignon

- Borysthenia naticina*
- Tanousia* cf. *stenostoma*
- Galba truncatula*
- Radix* sp.
- Valvata piscinalis*
- Pisidium henslowanum*
- Pisidium amnicum*
- Pisidium milium*



Interglacial conditions



3 mm



2 mm

Netherlands and Germany

Group C, Interglacial IV

Borysthenia naticina
Bithynia tentaculata
Bithynia troschelii
Parafossarulus crassitesta
Viviparus diluvianus

Noordbergum
 Exmorra

Group B, Leerdam Interglacial

Borysthenia goldfussiana
Parafossarulus crassitesta

Leerdam
 North Sea E8-4
 Wendelstein

Group A, Bavel Interglacial

Borysthenia goldfussiana
Tanousia runtoniana

Bithynia bavelensis
Viviparus gibbus
Valvata salebrosa
Lithoglyphus jani
Parafossarulus crassitesta
Fagotia wuesti

Bavel
 Zeuchfeld
 Kalsbrieth

Great-Britain

Groupe 3

Borysthenia naticina
Bithynia tentaculata
Belgrandia marginata
 Sidestrand/Trimingham

Groupe 2

Borysthenia naticina
Tanousia cf. stenostoma
Bithynia troschelii
Belgrandia marginata
 Little Oakley

Groupe 1

Borysthenia goldfussiana,
Tanousia runtoniana
Bithynia troschelii
Viviparus gibbus
 West Runton,
 Kessingland/Pakefield,
 Sugworth

France

Joinville le Pont B

Borysthenia naticina
Bithynia tentaculata
Bithynia troschelii
Belgrandia marginata

Coll. Munier-Chalmas, Jussieu
 Stratigraphy unknown

Carpentier/Léon

Bithynia troschelii

Coll. NLL, Meudon
 Stratigraphy Antoine et al.,
 2012, 2014

Moulin Quignon

Borysthenia naticina
Tanousia cf. stenostoma

Coll. B. Perthes, IPH

Bois Epinette

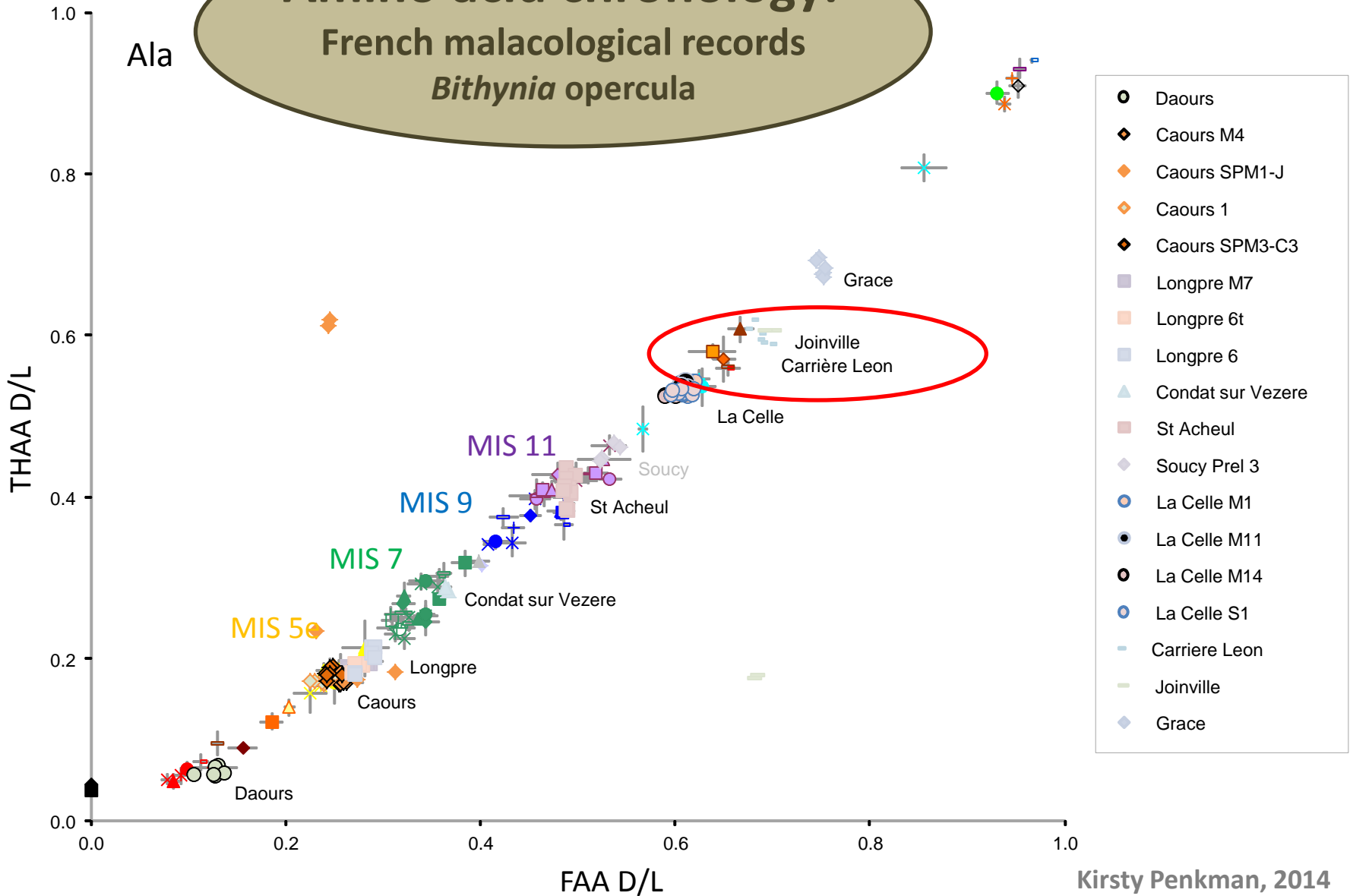
Tanousia runtoniana
Bithynia troschelii
Belgrandia marginata

Coll. J.J. Puisségur
 Collected by F. Bourdier 1971
 unpublished

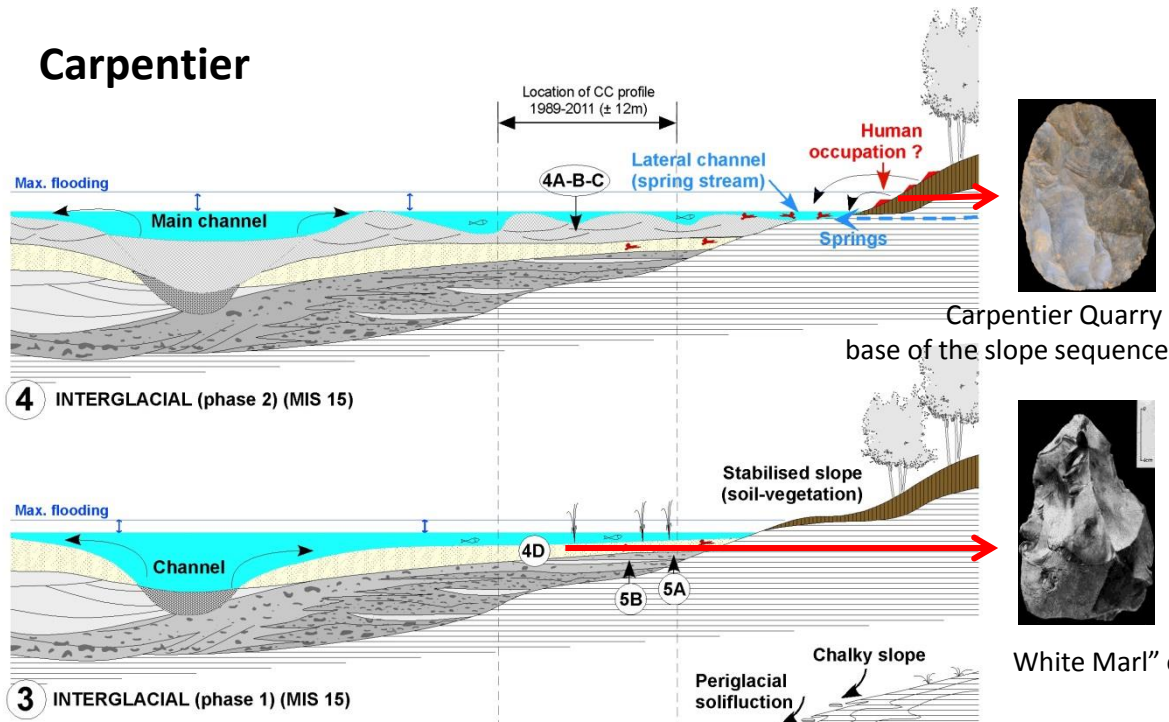
Interglacial of the
 2nd part of the Cromerian

Cromerian Biostratigraphy:
 NW Europe interglacial
 malacological records

Amino acid chronology: French malacological records *Bithynia opercula*



Carpentier



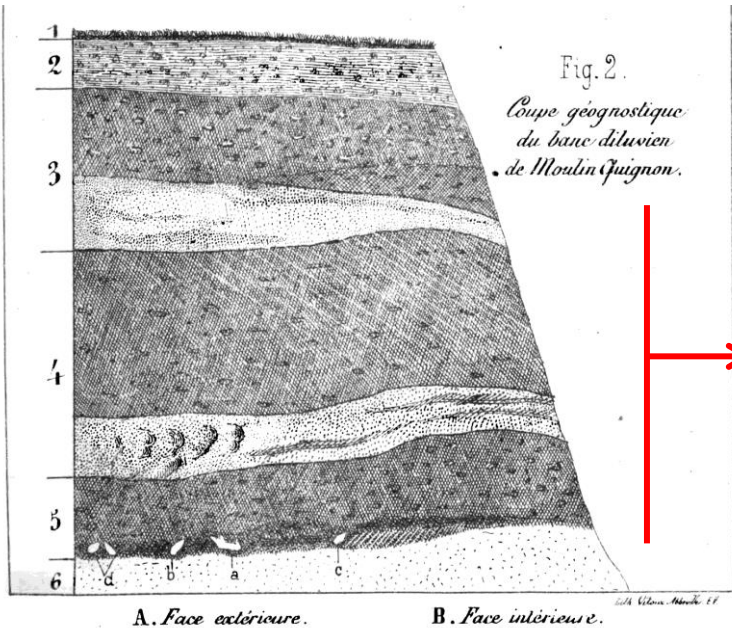
Carpentier Quarry
base of the slope sequence



White Marl" of the Carpentier Quarry

1) Coeval with the sedimentation of the White Marl and of its palaeontological remains : Interglacial/MIS 15.

2) Beginning of the following cold stage (Early MIS 14) and reworked during the same phase or at the end of this phase: could be dated between 600 and 550 ka.



Moulin Quignon



"Boucher de Perthes" Museum at Abbeville
Industry within the alluvial formation

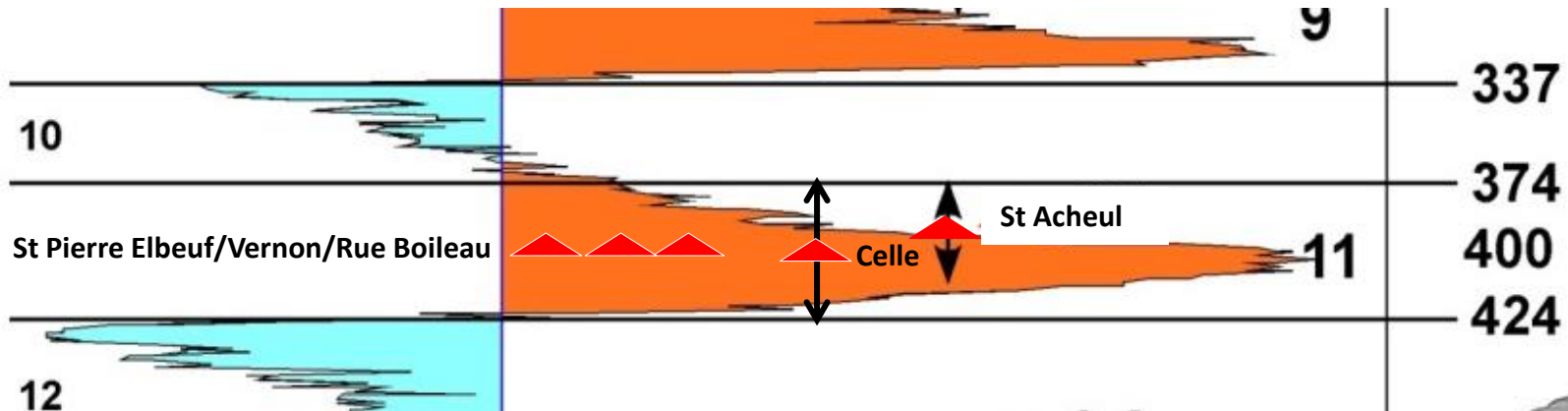
Morphostratigraphy
Palaeontology
Dating



Acheulean occupations:

End of the Cromerian complex,
temperate climatic episodes

Late Middle Pleistocene: MIS 11

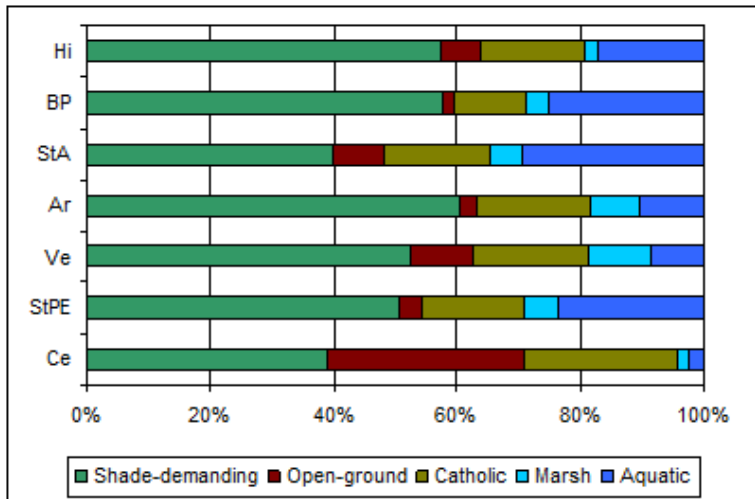


Tufas with rich malacological contents recording full interglacial environments:

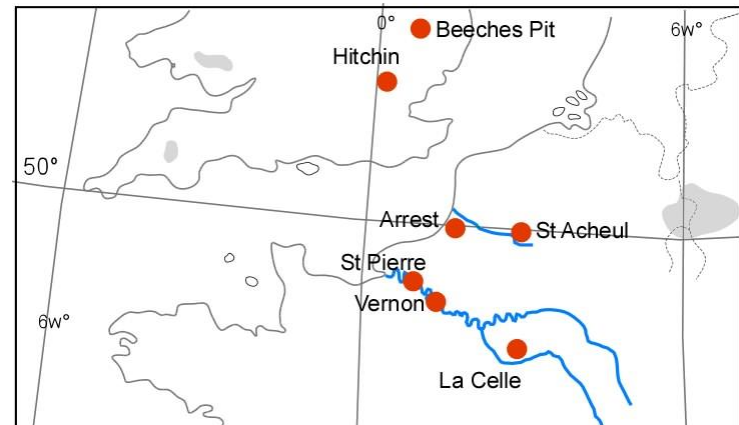


the « *Lyrodiscus* » assemblage = peculiar association of species out of range + extinct species

humid deciduous forest biotopes



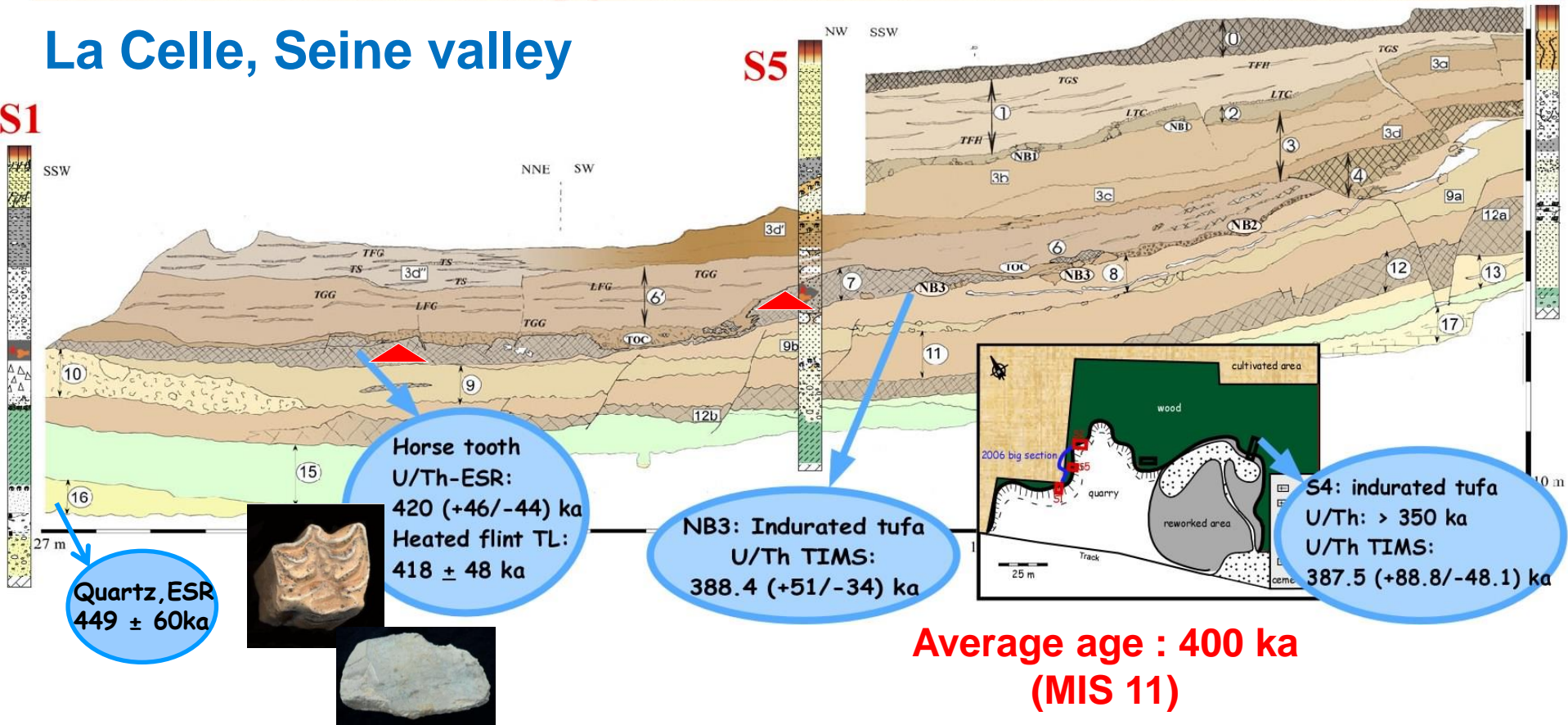
biostratigraphic key for MIS 11 sites of NW Europe



Longest and best documented record : La Celle



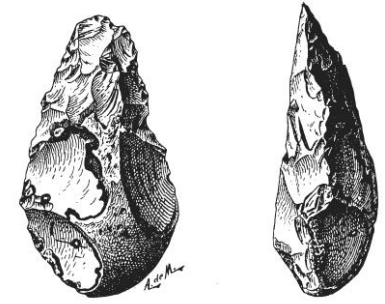
La Celle, Seine valley



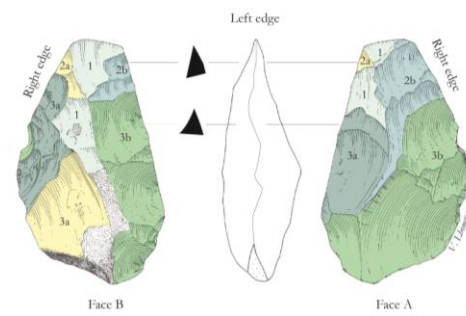
La Celle lithic industry :

E. Nicoud, V. Lhomme, N. Connet

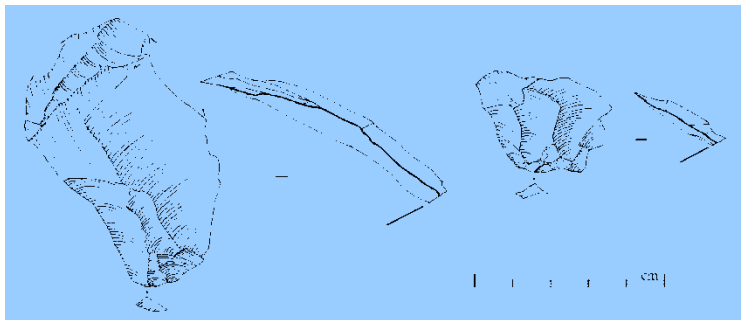
Excavations
2003/2006: 40 m²
bone remains : 145
flint: 28



Colin et al., 1895



Coll. Musée St Germain en Laye

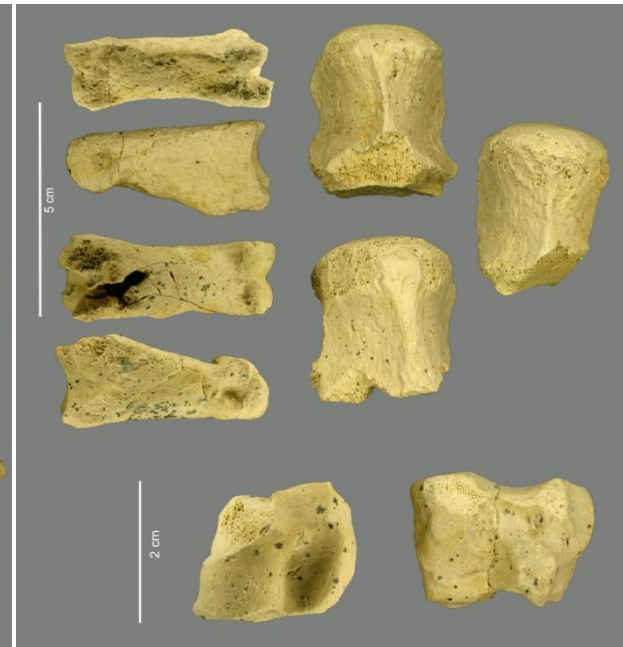


Excavation 2006: Bifacial shaping flake, short flake



La Celle mammals

P. Auguste



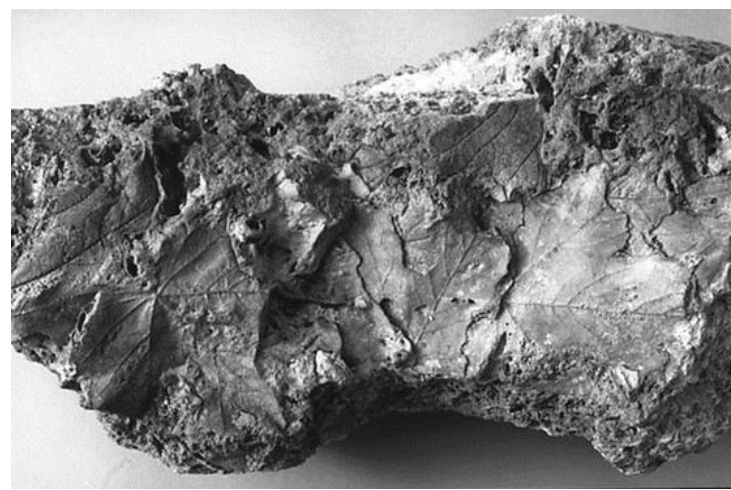
Layer 7:
Cervus, Equus,
Hippopotamus incognitus, Macaca sylvanus,
Unidentified carnivore



La Celle vegetation

M.C. Saad, J. & M. Dupéron

Revision of Munier-Chalmas leaf-prints collection:
166 samples, 25 taxa identified.

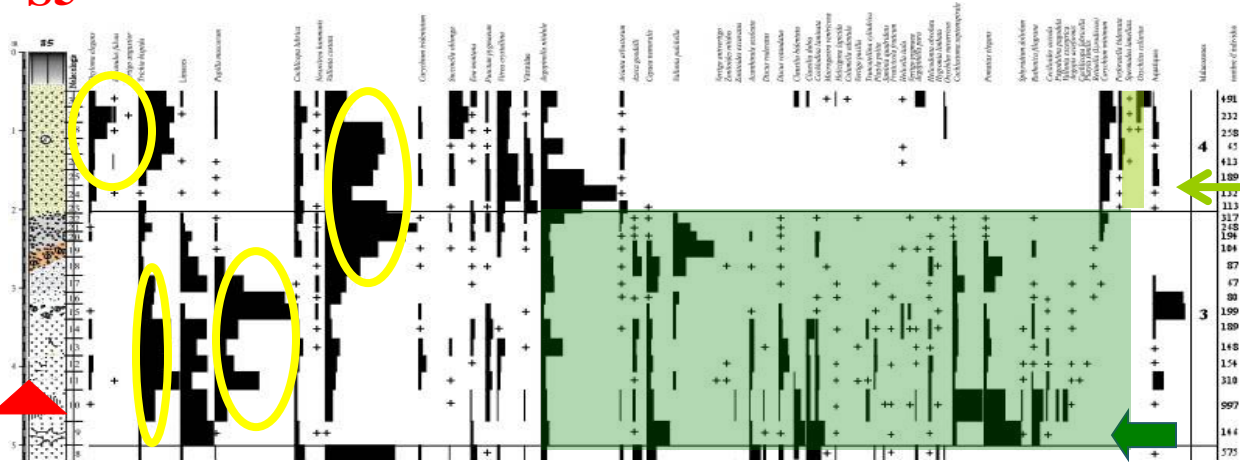


Assemblage of temperate elements like *Fagus*, *Acer*, *Quercus*...
and mediterranean trees such as *Buxus*, *Ficus*, *Celtis*.



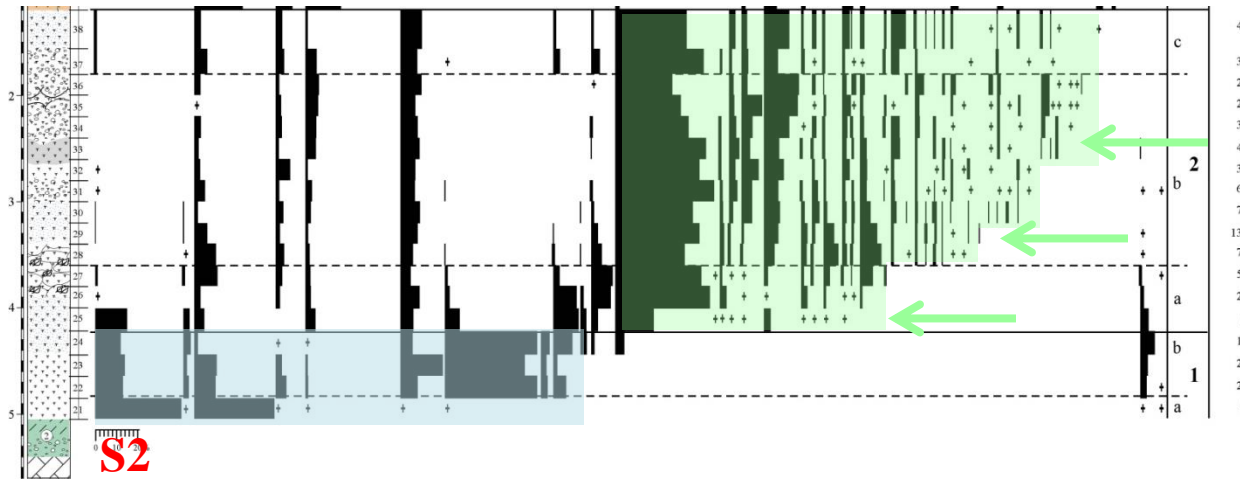
La Celle: composite malacological diagram

S5



4 Forest decrease
humidity increase

3 Deciduous forest
optimum



2 Forest development

1 Marshy open ground



S2

Isotopic record vs malacology in La Celle tufa

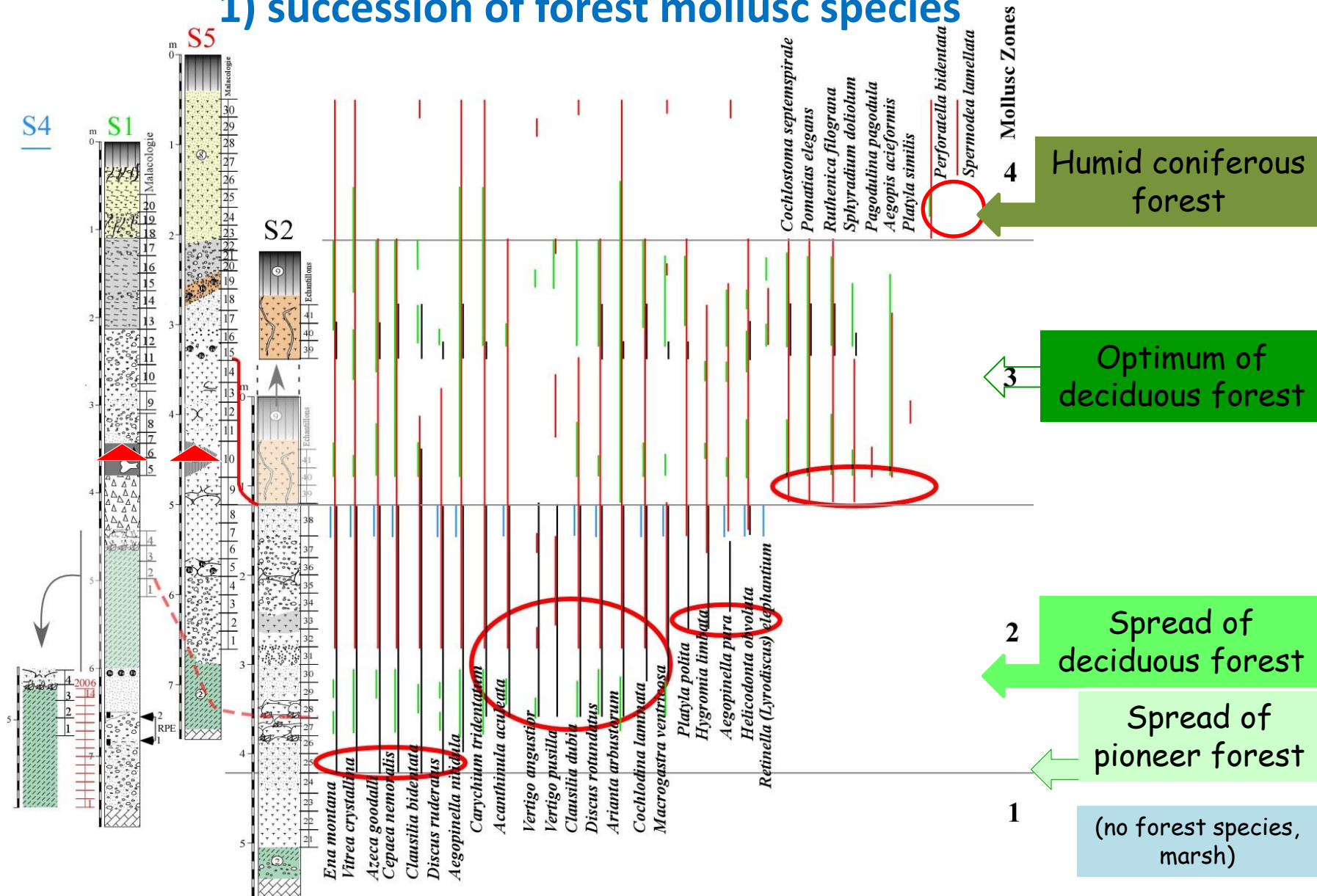


The Seine valley during Acheulean occupation at MIS 11 optimum



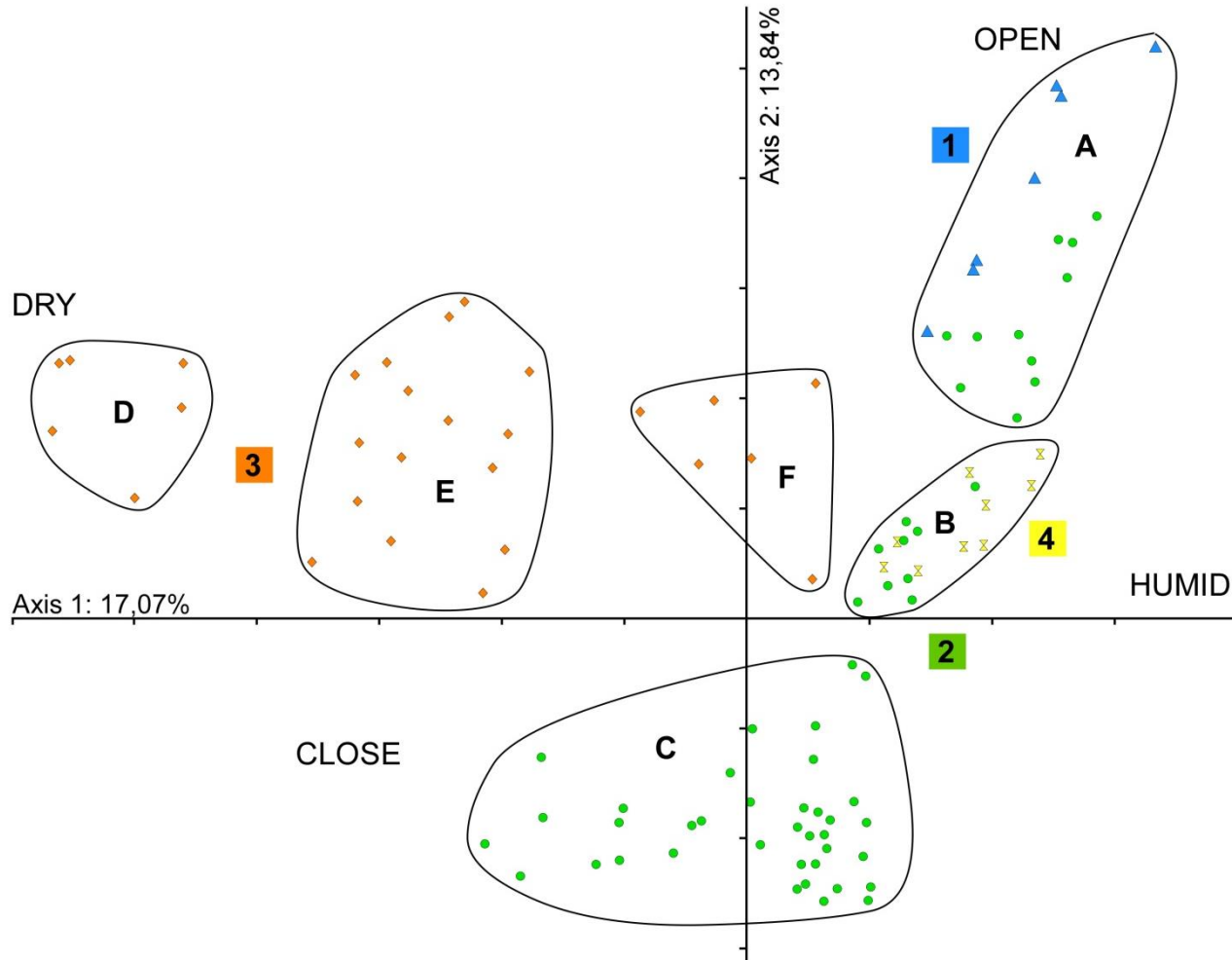
La Celle, environmental dynamic of the interglacial period

1) succession of forest mollusc species



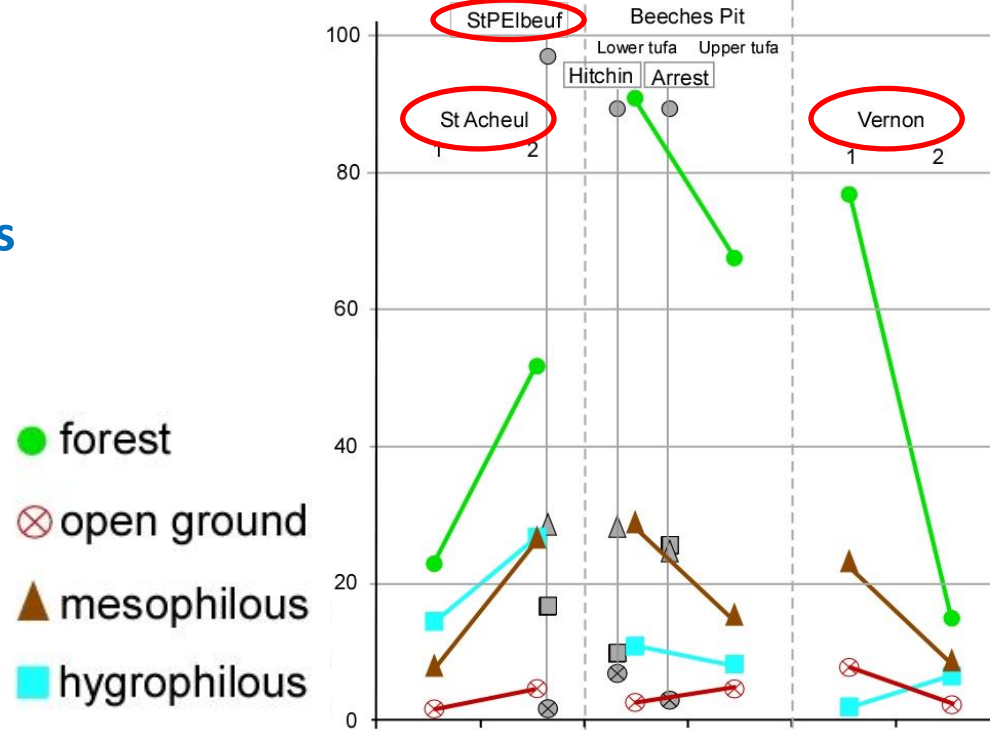
La Celle, environmental dynamic of the interglacial period

2) correspondance analysis

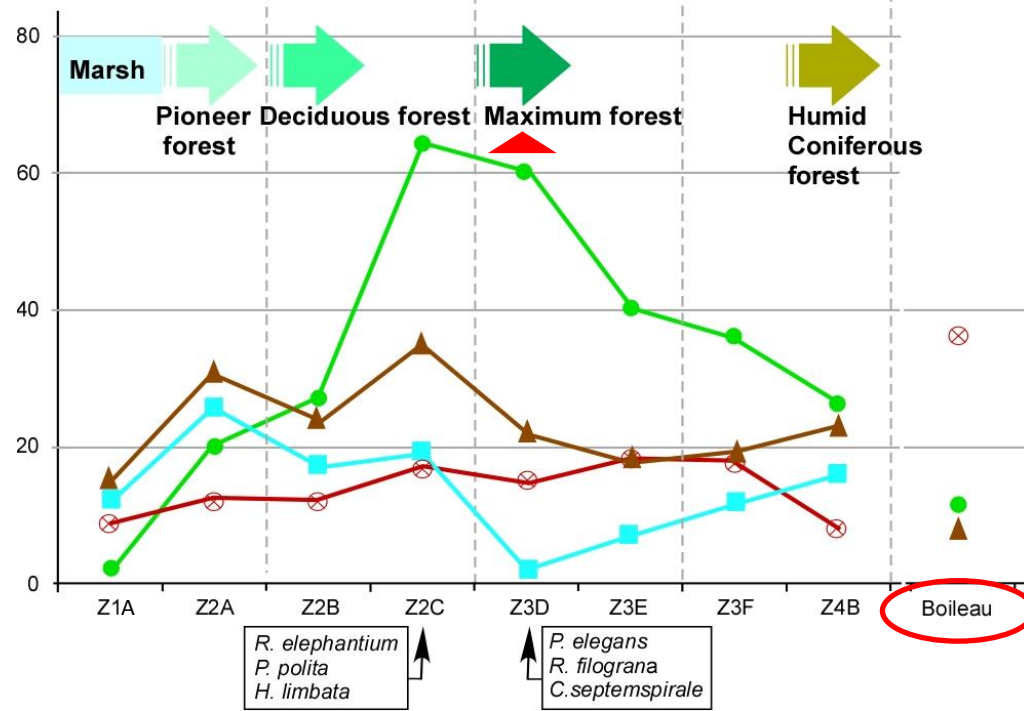


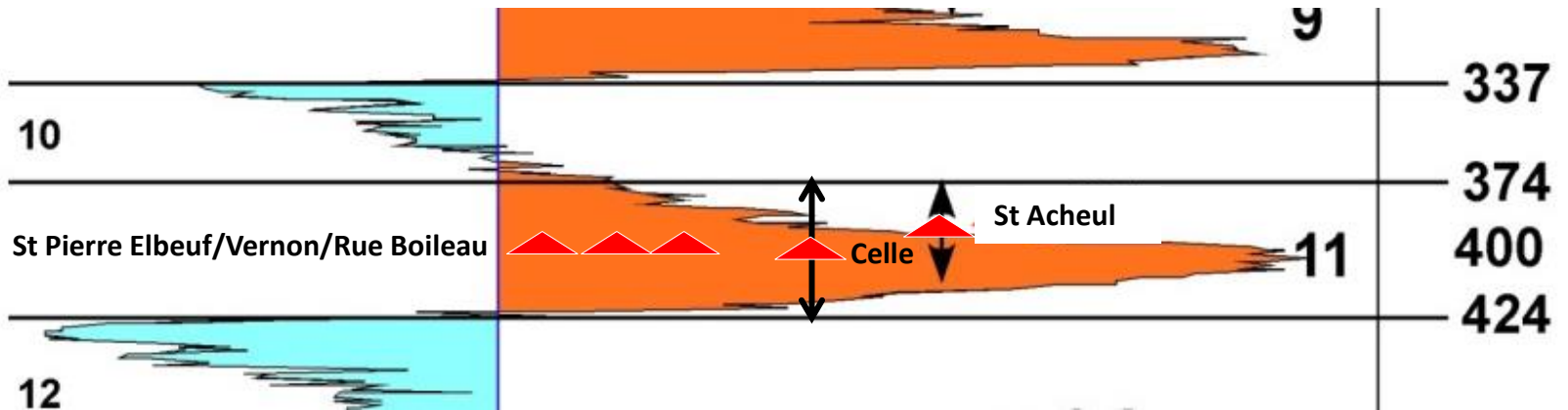
Distribution of samples according to environmental parameters vs biozones (1 to 4)

MIS 11 tufa deposits

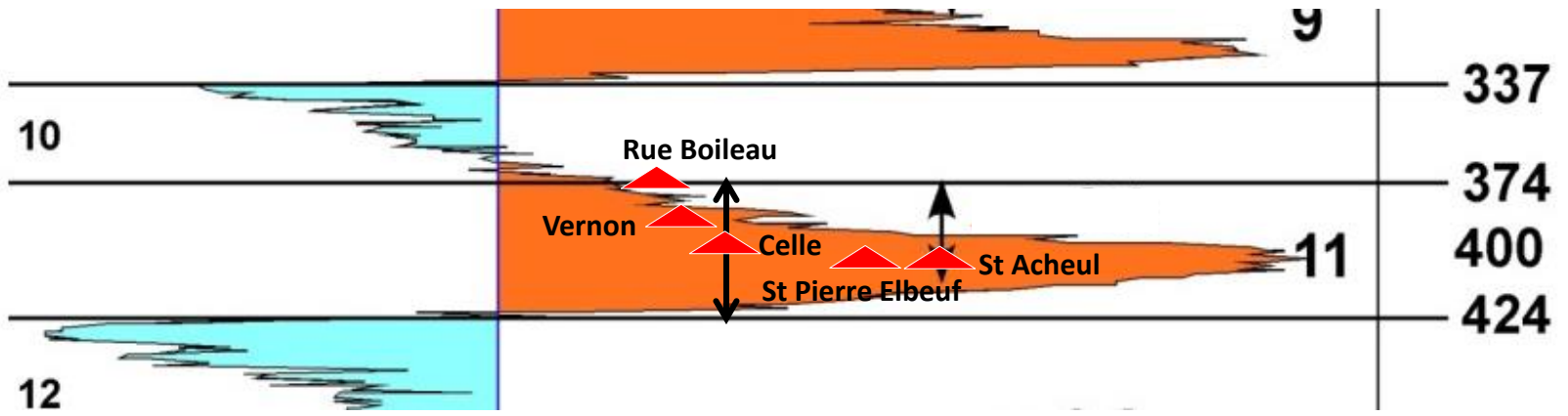


La Celle : model of evolution of malacological ecological groups during MIS 11



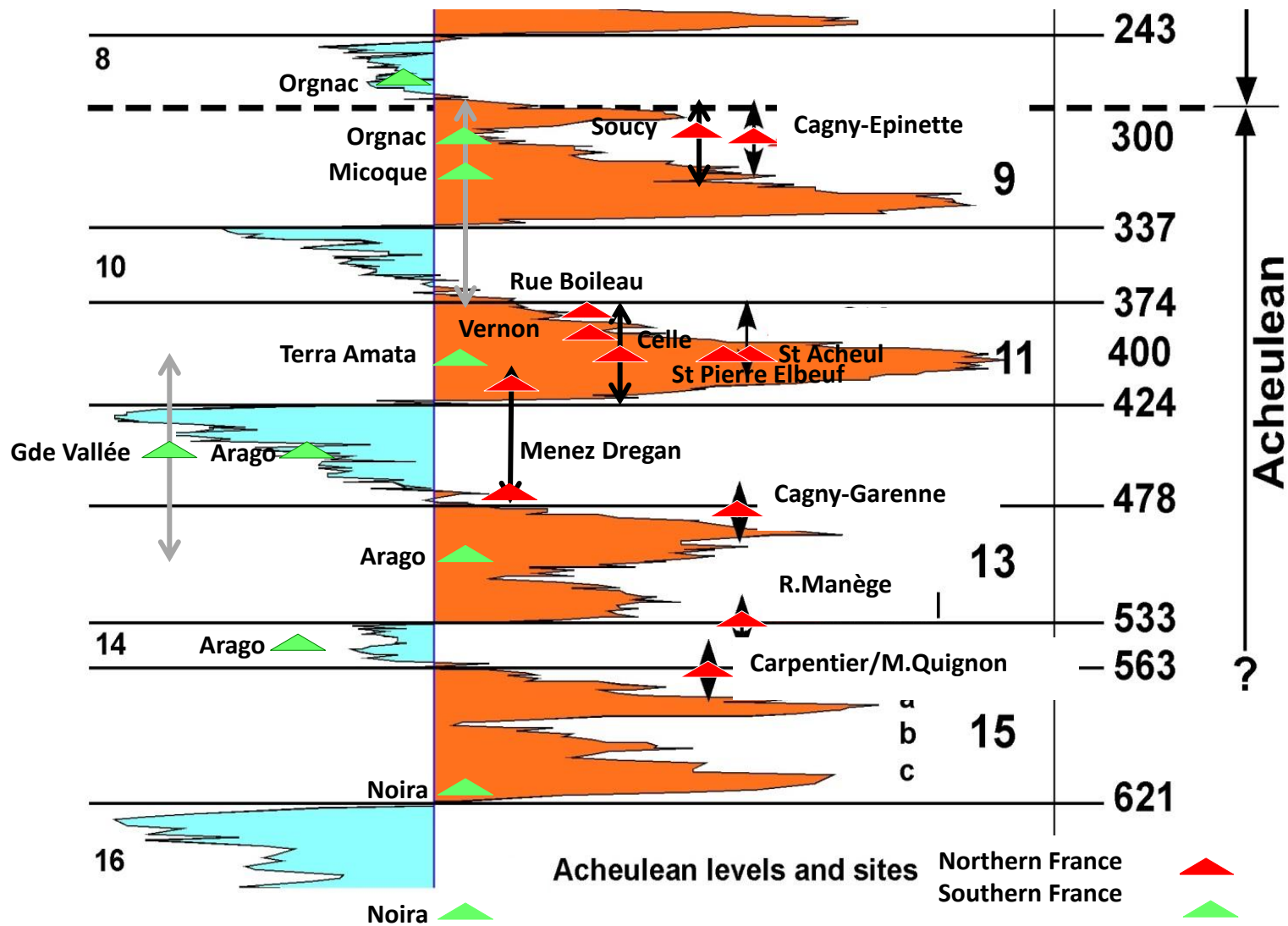


Succession of Acheulean occupations within MIS 11 interglacial



2014:
Environments vs Acheulean in Northern France
=
always in temperate climatic contexts,
interstadial or interglacial phases

Climatic contexts of Acheulean occupations: Northern vs Southern France



South: lack of environmental data but Acheulean settlements do occur during glacial stages