



Detailed record of interglacial palaeoclimates and palaeoenvironments in Northern France calcareous tufas: New data from the tufa sequence of Resson (Eemian) and comparison with the MIS 11c and the Holocene

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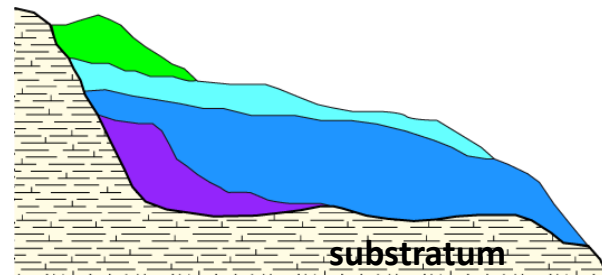
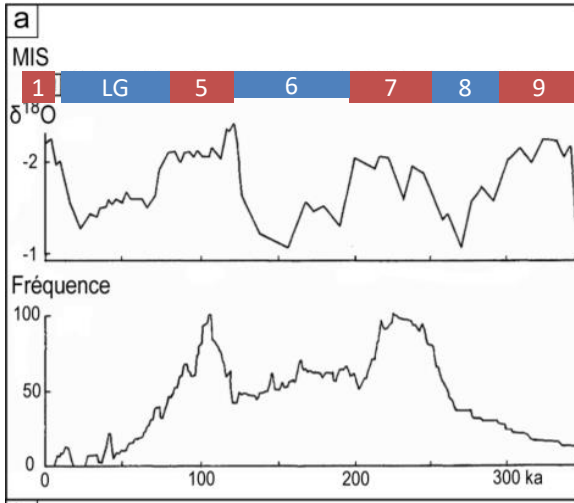
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Calcareous tufas: a unique archive of interglacials

Tufas request wet and temperate conditions = **characteristic of interglacials**

Only records of IG optima in fluvial systems



Typical fluvial sequence of large NW European valleys

- Full Interglacial (calcareous tufa)**
- Lateglacial / Interglacial** (calcareous fluvial silts and sands overlaid by organic soils)
- Pleniglacial** (fluvial gravels with sand lenses)
- Early Glacial** (slope deposits with under bedded fluvial silt levels)

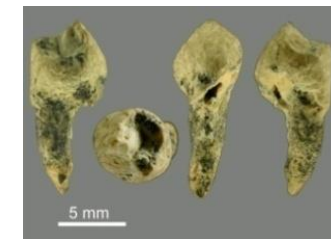
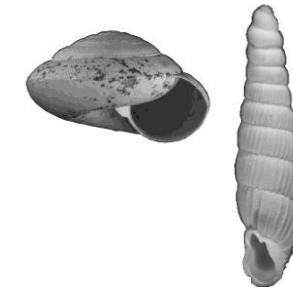


In situ preservation:

- Palaeoenvironmental information: mollusc shells, ostracods, mammals, insects and leaf prints, wood charcoal, etc.
- Archaeological levels

≈ 90-95 % CaCO₃:

- direct and precise U-TH serie dating (U/Th-TIMS)
- **O and C isotopes for palaeoclimatic reconstructions**



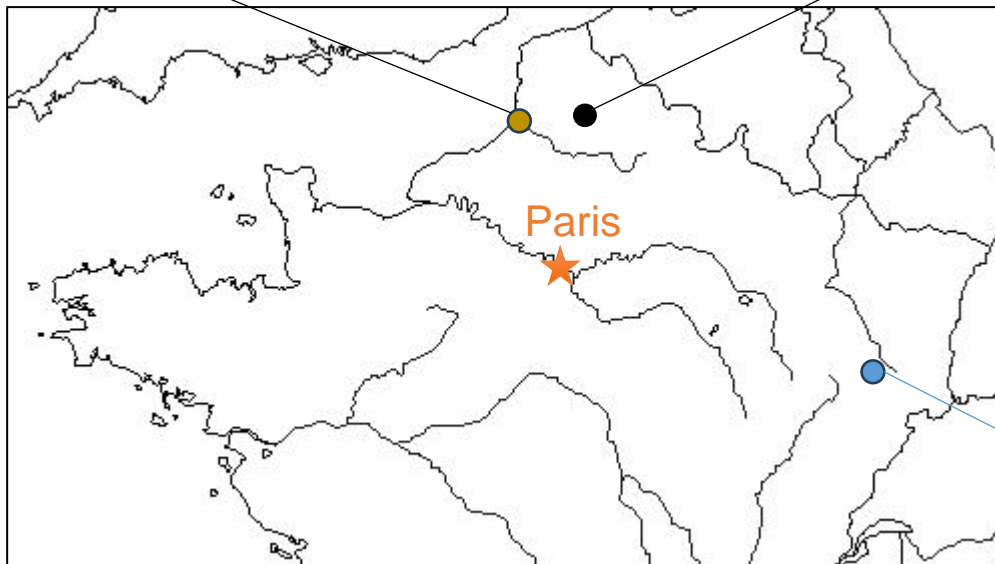
Calcareous tufas: a unique archive of interglacials

Long Eemian sequences in Northern France



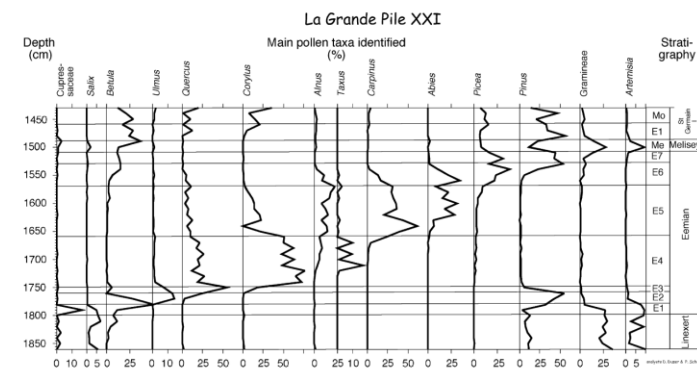
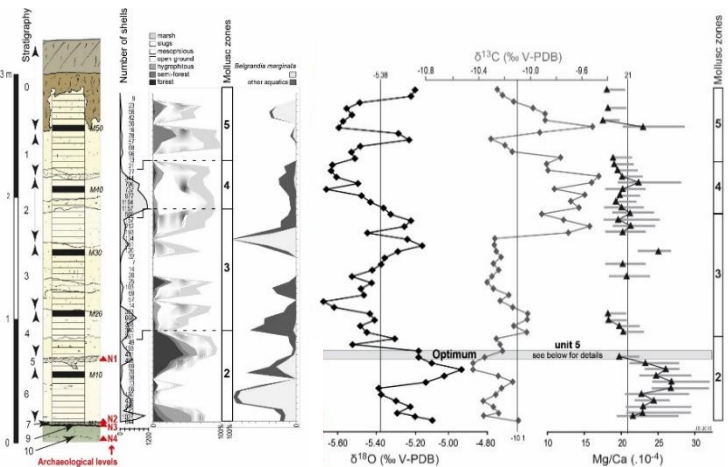
Caours

Waziers



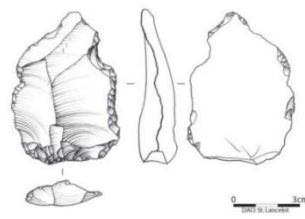
MIS 6 to MIS 5 transition
Deschodt and Hérisson (dir.), 2022-2023

La Grande Pile peat bog



Long and detailed records of both **palaeoenvironments** and **palaeoclimates**

Several archaeological levels



Continuous record for the last 140ka
Woillard, 1978 / De Beaulieu and Reille, 1992

Antoine et al., 2006 & in prep.
Dabkowski et al., 2016

Calcareous tufas: a unique archive of interglacials

Long Eemian sequences in Northern France

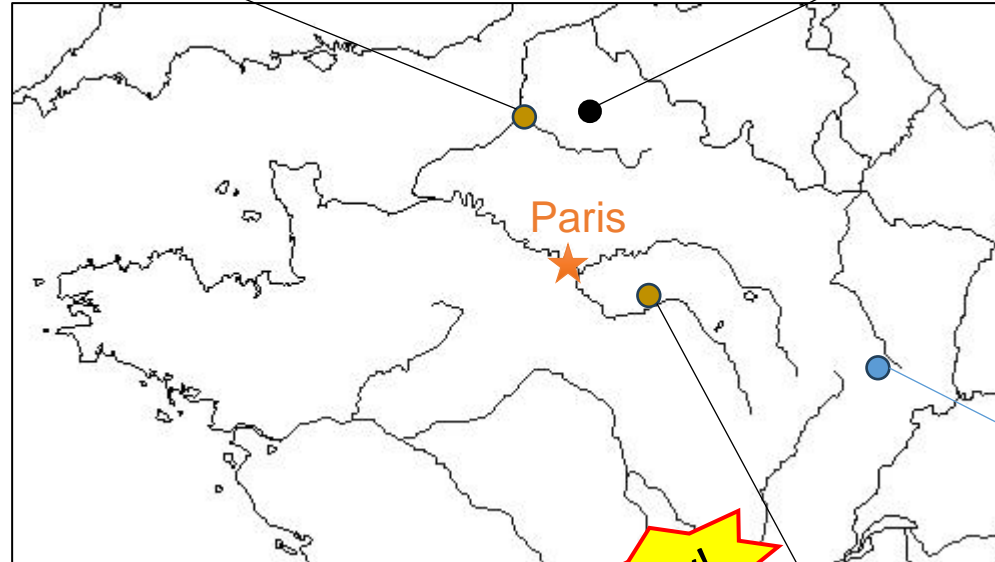


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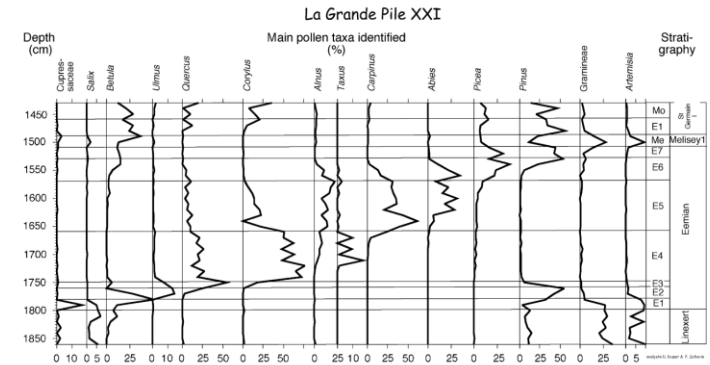
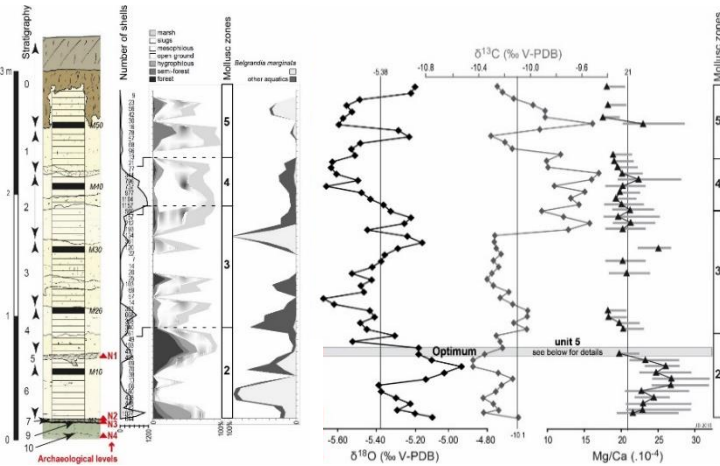


MIS 6 to MIS 5 transition
Deschodt and Hérissou (dir.), 2022-2023



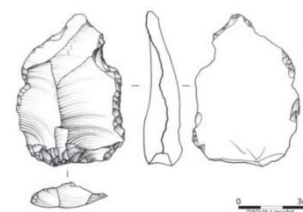
Resson

La Grande Pile peat bog



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Resson: former researches and collections

19th century: first mention (Leymerie, 1846) then detailed inventory (Fliche, 1883-1884)

Plant imprints
Mollusc shells

Re-examined
(Jolly-Saad et Dabkowski, 2021 – *Quaternaire*)

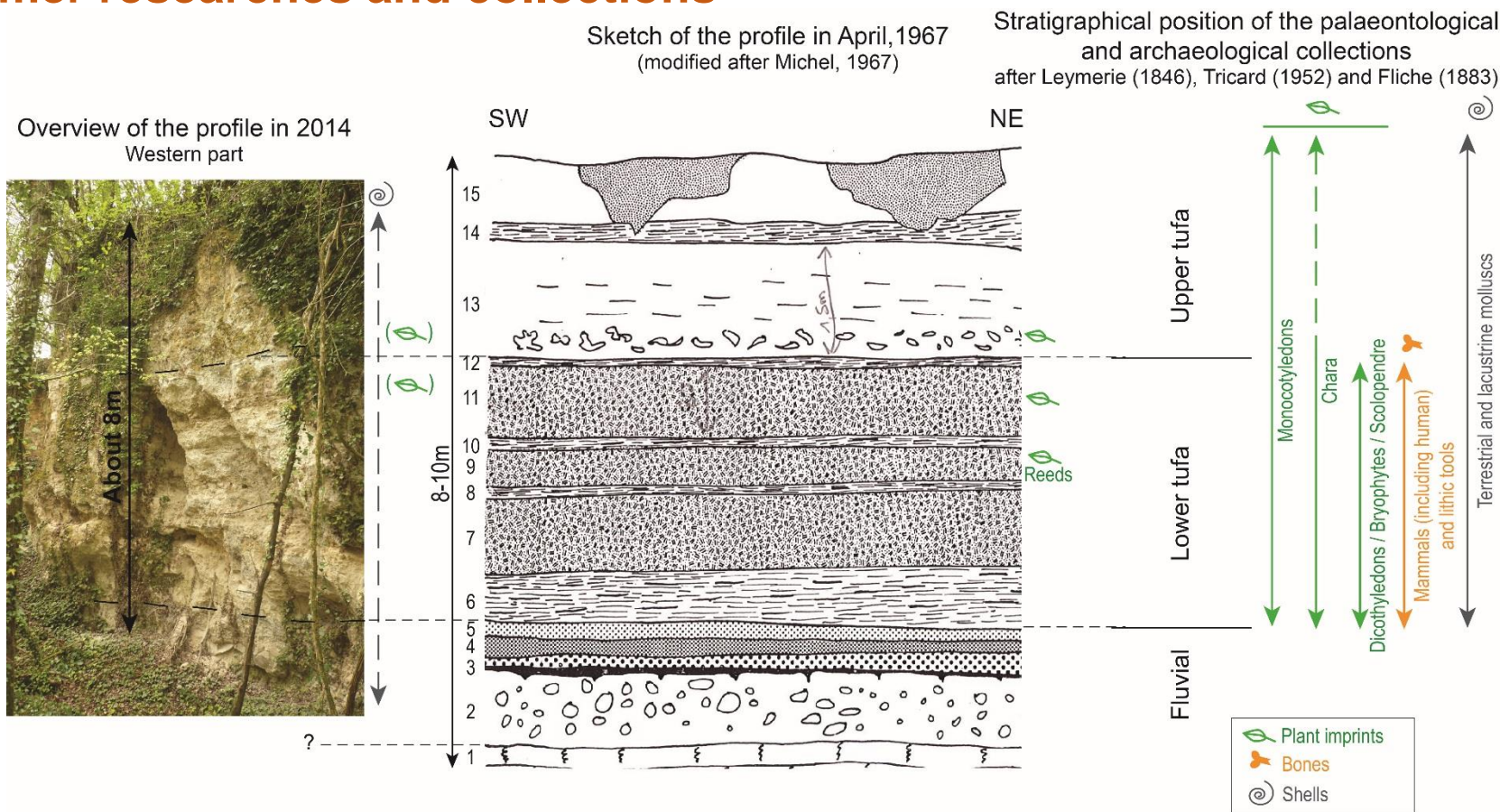


Vertebrates: Rhinoceros, Elephant, Cervids, Beaver, Dog, Wild duck

“Indisputable evidences of the human presence”: “Moustier type” flint tool, bones with cut marks and intentional breakage, pointed antlers, human remains

Collection not yet retrieved

Resson: former researches and collections



Geomorphology + palaeobotany + palaeontology (incl. Molluscs)

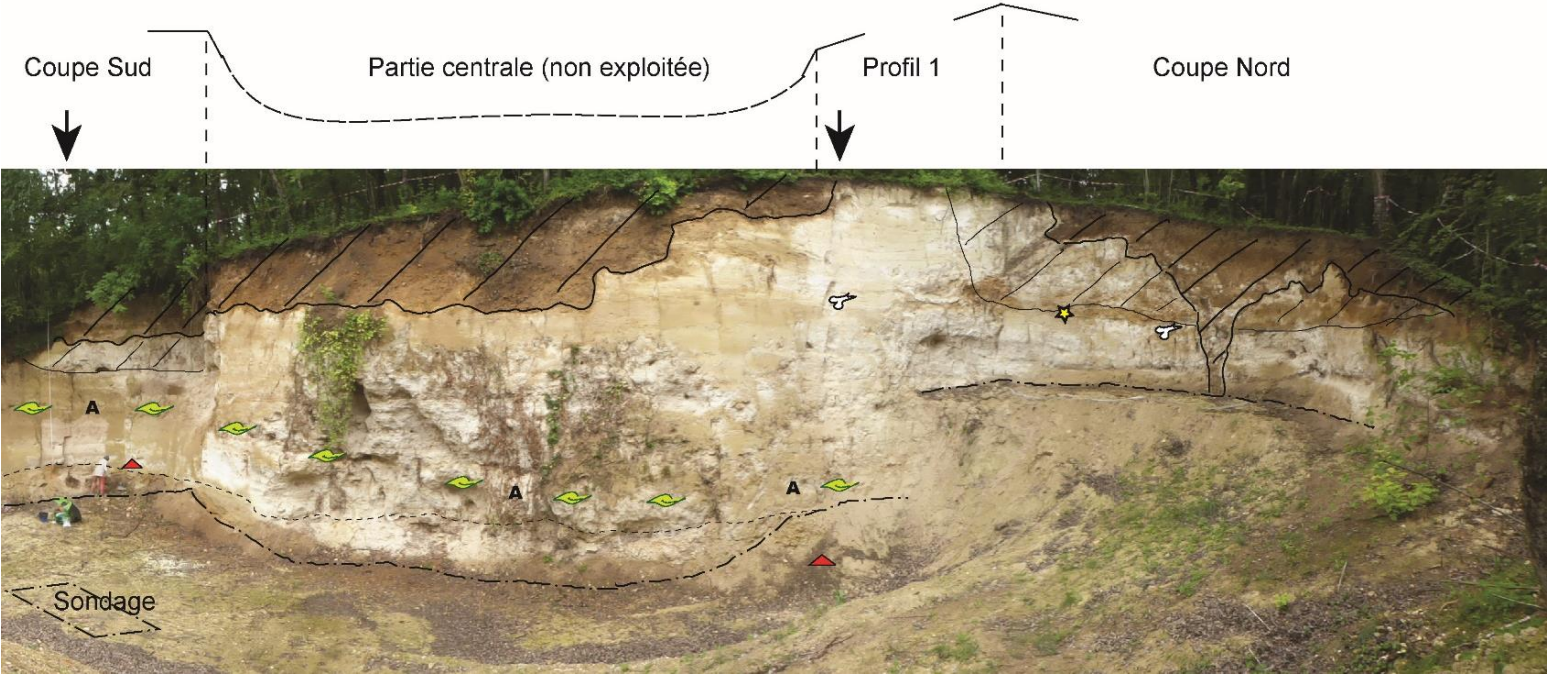
⇒ **LAST INTERGLACIAL**

Good preservation + high richness

⇒ Strong potential for **paleoenvironmental reconstructions**

Archaeological potential?

Resson: new field works (2020 & 2021)



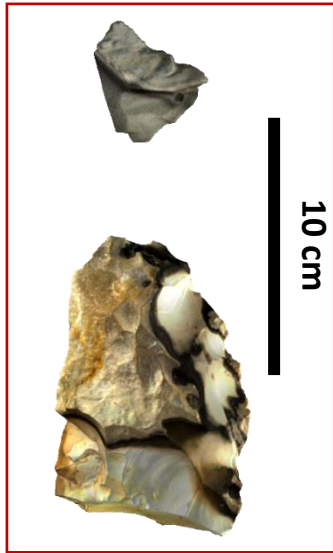
A 25m-long section: **stratigraphical** description of several profiles
Malacological and **geochemical** sampling



Resson: new data

Eemian attribution confirmed

Evidences of human presences (lithic and faunal remains)



2x U-Th: $124 \pm 6\text{ka}$ = Eemian



Conclusion and perspectives

New data from Resson tufa:

Eemian attribution confirmed (U-Th dating: $124 \pm 6\text{ka}$)

Dilated climatic record of the beginning of the Eemian

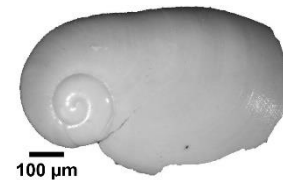
⇒ Complementary to the Caours record

Malacological study in process + new plant imprints

⇒ **Detailed palaeoenvironmental data + discussion with palaeoclimatic reconstructions**

Evidences of human presences (lithic and faunal remains)

⇒ Archaeological excavations in 2024



Comparisons with other interglacials:

MIS 5e temperatures similar to the **Holocene** but **wetter conditions**

MIS 11c warmer (not only during the optimum) + **with very humid episodes**