The Upper Solutrean (24-23.5/23 ka cal BP) saw the development of a set of specific and diversified hunting implements. In the same time, two new technical processes appear: pressure retouch and the heat treatment of silica rocks. The latter alters the mechanical properties of rocks and may improve their knapping quality and the sharpness of the resulting artefacts.

Heat treatment has rarely been understood in its techno-economic context, its prevalence remains poorly assessed in France and the data available on it is still relatively scattered. We present here one aspect of a research project aiming to understand the conditions of emergence and implementation of heat treatment during in the Upper Solutrean in south-western France.

Characterising the heat treatment technique used by Solutrean groups is important for evaluating the level of technical and economic complexity related to its implementation.

**Determining heating temperatures**

The applied infrared spectroscopic analysis is based on the assumption that the heat-induced transformations of silica rocks are caused by the gradual disappearance of silanol (SiOH), causing a progressive reduction of the network of intergranular pores (for the detailed theoretical framework and mechanisms, see Schmidt et al. 2013).

**Heat treated shaping flakes from the C-E layer of the Piage deposit (Fajoles, Lot)**

**Macroscopic observations : heat treatment proxies**

- **Reddening**: caused by the oxidation of iron oxides and depends on their concentration.
- **Whitening** of the surface: caused by internal microcracks related to the sudden evacuation of structural water, occurs at higher temperatures.
- **Gloss**: results from the transformation of the mechanical properties of the material. Its recognition is easier when it is associated with matt pre-heating removal scars (i.e. gloss contrast). In this case, it’s the most reliable macroscopic criterion to identify a heat treatment on artefacts.

**First results for the solutrean of Le Piage(Fajoles, Lot)**

- Some of the analysed artefacts remain indeterminate because of the overlap of values produced by unheated artefacts and artefacts heated at low temperatures,
- Artefacts having produces unambiguous values (not affected by the overlap problem) indicate heating to a temperature range between 250° and 300°C. This pleads against the use of open-air fires for heating and in favour of a more controlled heating process.

Finally, although the conservation of the Solutrean level is not optimal at Le Piage, these results show that only bifacial points (in particular laurel-leaf points) were subjected to intentional heat treatment. On the other hand, the rest of the hunting equipment (i.e. shouldered points) does not show the implementation of this technical process.

How can we translate these facts into cultural choices? We will now try to answer this question from a broader corpus.

Comparison of the hydration ratios of the archaeological corpus (right) and the calibration series established from geological samples heated successively to 150, 200, 250, 275, 300 and 350°C (left).