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# Lower Palaeolithic stone tools : a techno-functional study on flakes from bifacial shaping at Soucy 3P (MIS 9, Yonne, France)

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## Introduction

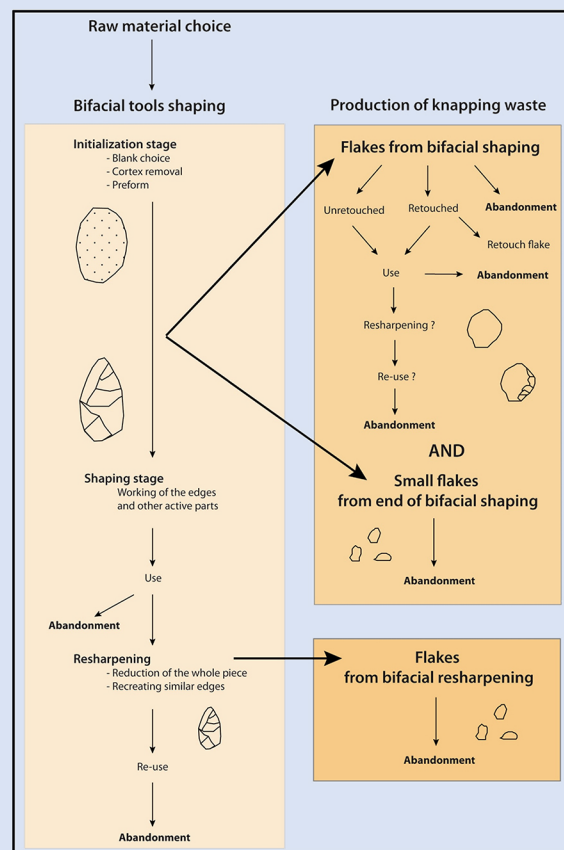
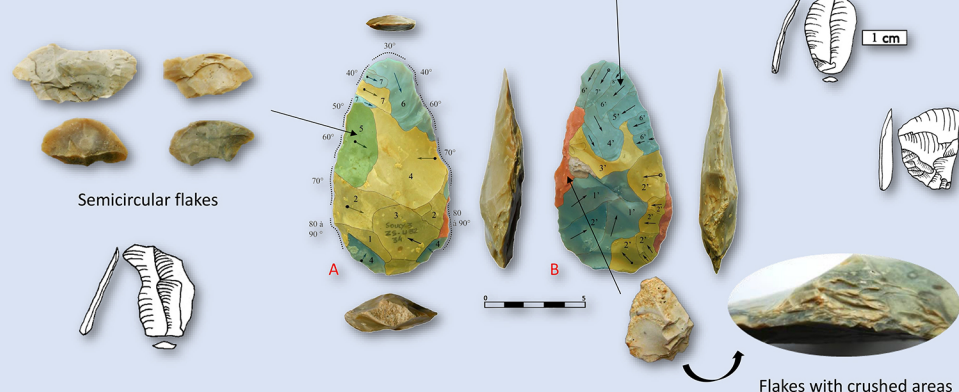
We present an example of techno-functional combined analysis led on the lithic serie from Soucy 3P. This lower Palaeolithic archaeological level is contained in a fine fluvial sequence and dated to 350 000 years. It yielded the highest quantity of bifacial tools observed in Europe and also a large number of small flakes, unretouched flakes and flake tools. However, wasted flakes from bifacial shaping are rarely studied, that is why we focused on these products using lithic technology and use-wear analysis.

## Lithic technology

Lithic technology study led on small flakes has shown that reduction processes are poorly represented : flake tools are never resharpened and bifacial tools very rarely. Small resharpening flakes come from the whole edges of the bifacial tool, which confirms the concept of « biface as a tool » at Soucy 3P. A diversity of small flakes coming from the end of bifacial shaping is attested. They correspond to different positions, stages of confection and technical consequences wanted on the bifacial tools. These products inform us on technical intentions which cannot be directly observed on tools : previous confection or modifications made on tools carried out of the site.

Artifacts	N=
Bifaces	276
Unretouched flakes	4843
Retouched flakes	887
Small flakes from bifacial shaping	6539
> Among which flakes from resharpening	432 (7%)

Lithic industry from Soucy 3P



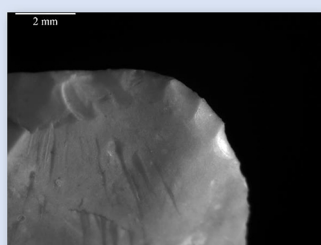
Chaîne opératoire of Soucy 3 P

## Use-wear analysis

Use-wear analysis has shown that retouched and unretouched flakes from bifacial shaping were used. This indicates that bifacial tools are not the only tools. A preliminary analysis shows that flakes were used in varied motions such as transversal unidirectional or longitudinal bidirectional motions and on varied hardnesses materials such as soft, hard or semi hard materials. Working of a hard material in a transversal unidirectional motion is evidenced both on flakes and bifacial tools.

	Use-wear analysis sample	Artifacts with use-wear traces
Unretouched flakes	4	2
Retouched flakes	15	4
Small flakes from resharpening	6	0
Bifaces	13	4
Broken tip of bifaces	2	0
Coup de tranchet	5	1
<b>Total</b>	<b>45</b>	<b>11</b>

Use-wear analysis sample and results



Microflakes showing a working of a possibly soft material in an unknown motion



Rounding, polish and striations showing a transversal unidirectional motion on a hard worked material



## New questions and work perspectives

This work shows the informative potential of flakes in the study of techno-economical behaviours during Lower Palaeolithic in Western Europe. We can now wonder about functional link between flakes and bifacial tools: is there a complementary or a functional overlapping ?

This technological and functional study is ongoing on a larger sample to prolong the debate.

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