CHAPTER 13
TEMPORAL VARIABILITY
CHANGE OR CONTINUITY IN STRATEGIES THROUGH TIME

During the Early Upper Paleolithic, although the number of sites studied in detail is small, it is possible to make some comments about changes in lithic economy through time. These include changes in reduction techniques, the development of new tool types, changes in procurement strategies, and possibly changes in mobility and settlement strategies. The following discussion should be taken as a provisional interpretation of change in lithic economy during the Early Upper Paleolithic, based on the sites studied. It can, however, serve as a framework for subsequent studies of lithic economy.

In the discussion of the MP-UP transition in chapter 3, I suggested that early modern humans migrating into Europe, even with new Aurignacian technology and new social behaviors, would have continually encountered unfamiliar environments. Upon arrival in each new region, there would have been a period of familiarization during which shelter, subsistence and raw material resources were located and their patterns of availability (particularly for subsistence resources) learned. This could account for the relative lack of change in hunting practices during the first part of the Early Upper Paleolithic. I suggest here that there would have been a continual process of change, from the MP-UP transition to the end of the Early Upper Paleolithic, as follows:

Mousterian	local development during the Middle Paleolithic
MP-UP transition:	following Mithen (1996) for a hypothetical cause of the changes observed during the Early Upper Paleolithic, cognitive fluidity was achieved in the minds of early modern humans
Early Aurignacian:	in a hypothesized core area, Aurignacian technology would be invented, with a period of experimentation before widespread adoption; once established in the core area (since the early Aurignacian across Europe appears to contain all of the basic components – reduction techniques, tool types, bone industry – as did the Neolithic), early modern humans began migrating across Europe, encountering unfamiliar landscapes. In each new region, there would have been a period of familiarization with the resources available.
Established Aurignacian:	Again in each region, once this familiarization process was complete, all aspects of the Aurignacian "culture" could be further developed and elaborated, with observable changes in lithic economy, settlement patterns, hunting strategies, etc.
Gravettian:	This process of development and elaboration, or continued innovation, would have led to the technological and typological changes that serve to distinguish the Aurignacian from the Gravettian.

The sites studied are here examined within this framework, to observe the process of change in the Early Upper Paleolithic of Belgium. The sites exemplify each of the above phases of change, but it should be clear that single sites cannot be used to extrapolate patterns of change for the entire region. The following discussion presents merely a possible interpretation, which can then be subject to further analysis.

Mousterian

The recently published analyses of the archaeological collections at the cave site of Sclayn (Otte *et al.* 1998) are useful for making provisional hypotheses concerning the nature of change in lithic economy at the MP-UP transition. There are two principal Mousterian archeological horizons: 1A is dated to about 40 thousand years BP (radiocarbon dates on bone collagen of >36.2 and 38.6±1.5 kya; uranium date on calcite of >36 kya; TL date on burnt flint of 44.0±5.5 kya); Stratum 5 is dated by TL to 130±20 kya. According to the latest chronostratigraphic hypothesis (Bonjean 1998), Stratum 5 was deposited during a cool episode within the Eem Interglacial (isotope stage 5c/b=Grande Pile pollen zone "St.Germain 1b"), which however would place this horizon at around 95 kya, which is in apparent contradiction with the TL date. Stratum 1A at Sclayn was formed during a major temperate episode near the end of isotope stage 3 ("Hengelo") that was, nonetheless, colder than most of stage 5, with only modest reforestation (Haesaerts 1984).

Sclayn Level 5 – Mousterian		**% by count**	**% by weight**
Rank 1	Quartz	50.56	51.54
Rank 2	chert	27.51	13.72
	Maastrichtian flint	15.85	16.72
Rank 3	psammoquartzite	5.37	15.84
	Campanian flint	0.37	0.43
	limestone	0.30	1.42
	other flint	0.02	0.03
	Brussels sandstone	0.01	0.13
	phtanite	0.01	0.17

Table 13.1. Grotte Scladina, Stratum 5. Raw material ranking by count and weight (after Van der Sloot 1999:124)

Stratum Level 1A – Late Mousterian		**% by count**	**% by weight**
Rank 1	semi-local flint	70.18%	59.88%
Rang 2	quartz	11.59	10.97
	chert	8.87	8.19
Rang 3	sandstone	3.28	9.65
	non-local flint	2.81	3.06
	quartzite	3.21	8.17
	phtanite	0.06	0.08

Table 13.2. Grotte Scladina, Stratum 1A. Raw material ranking by count and weight (after Loodts 1999:84).

The two Mousterian assemblages at Sclayn (Loodts 1999; Van der Sloot 1999) show marked differences in their raw material structure (Tables 1 and 2) which suggest changes in quality requirement for lithic reduction from the Middle Mousterian (Level 5, 95-130,000 BP) to the Late Mousterian (Level 1A, c. 40,000 BP).

In Sclayn Level 5, non-flint materials dominate the assemblage (Table 1). The Rank 1 material is local quartz (51% by weight and count), followed by local chert (27.5% by count). Maastrichtian flint (from the Hesbaye Plateau), as Rank 2, accounts for only 16% of the assemblage. Of the range of Rank 3 materials, Campanian flint (from the western Hainaut basin) accounts for only 0.37%.

However, the majority of retouched tools – sidescrapers, denticulates, knives and others - were produced on Maastrichtian flint (112 of 163 tools; Van der Sloot 1999:124, Table 2) and only 14 tools on quartz. There are 47 cores and 1105 flakes on Maastrichtian flint, as compared to 191 cores and 338 flakes on quartz, which is represented mainly by chunks (*cassons*) (65.61%) and splinters (*esquilles*). This suggests first, that the better quality flint was maximized and used to produce formal tools and second, that quartz may have been subject to an expedient technology, producing flakes and chunks which had effective edges without retouch.

This pattern resembles that for Strata 5-3 at Le Trou Magrite, where, due to the great distance to the nearest flint sources, local limestone artifacts outnumber flint artifacts but more formal tools were made on flint. At Sclayn, where the nearest source of flint is between 20 and 40 km away, it appears that the distance threshold was much shorter. Quartz, like limestone, is extensively exploited, but the majority of formal tools are made on the existing supply of flint.

In Sclayn Level 1A, in contrast, flint becomes overwhelmingly dominant (Table 2). Semi-local flint, as Rank 1, accounts for 70.18% of the assemblage by frequency and 59.88% by weight. Non-flint raw materials, however, continue to be exploited, albeit in much lower percentages. This suggests a change in procurement strategy: instead of relying on local poorer-quality materials to supplement an existing supply of flint, flint was regularly procured from the nearest non-local flint source (on the Hesbaye Plateau) to meet the higher quality needs for tool production. In other words, the distance threshold was extended and the procurement of good quality flint outweighed procurement costs. This pattern, apart from the continued use of non-flint materials, much more closely resembles that observed at Early Upper Paleolithic sites (such as Spy and Goyet) in Zone 2.

MP-UP transition

The site of Couvin, dated to around 46,000 years, contains an industry that combines both Middle and Upper Paleolithic elements: flake and blade technology and the presence of a series of foliate points. The presence of a possible Neandertal deciduous tooth implies that this industry was made by Neandertals. The area excavated is limited, but appears to contain only blanks and finished tools, with nearly half of the assemblage consisting of trimming flakes. Thus, the only reduction activity in this area of the site was the shaping of blanks or resharpening of transported tools. This supports an interpretation of the site as a short-term, logistical camp (*sensu* Binford 1979) where blanks and/or finished tools were brought to the site for a specific purpose. The presence of a number of foliate points, probably special-purpose tools, adds to this view. Additionally, flint sources are absent in the Couvin region and the transport of tools suggests awareness of this lack. In sum, the pattern of transport form, reduction activity and tool structure shows planning in anticipation of both the lack of flint and of the intended activities.

Early Aurignacian

Le Trou Magrite, Stratum 3, if the date of 41 ± 1.7 thousand years BP is reliable, represents the earliest occurrence of the Aurignacian in Belgium. Limestone is dominant, by weight and count, over Hesbaye flint, which is present as very small artifacts. As an early Aurignacian site located in Zone 3, far from flint sources, this suggests a relative unfamiliarity with the region. Flint was transported, probably as an active toolkit en route, but was too diminished upon arrival to serve as an adequate supply for the site. Given the great distance to the nearest flint source, local limestone was thus exploited. Reduction strategies were modified to maximized flint: ordinary flake technology was used on limestone and prismatic blades and bladelets on Hesbaye flint.

Established Aurignacian

Stratum 2 at Le Trou Magrite, dated to 32/34-28,000 years BP, represents the established Aurignacian, being some 7,000 years younger than Stratum 3. During this occupation, Hesbaye flint is better represented, with more cores and chunks, blanks and tools. This suggests that a more substantial active flint toolkit was transported. Additionally, the existing flint tools were subject to increased intensity of use and re-use, evidenced by the much higher quantity of trimming flakes present. As in Stratum 3, limestone was again necessary to provision the site. However, the raw material structure suggests a greater familiarity with the region: an attempt to transport a more adequate flint supply although limestone was again needed.

The sites of Goyet and Spy, like the majority of Aurignacian sites in Belgium, are found in Zone 2. This concentration of cave (hence, shelter) sites along the Meuse river basin and its tributaries, could reflect an overall adaptation in settlement and mobility strategies, limiting "residential" occupations to the region where flint sources were within easy reach via regular, perhaps embedded, procurement trips. From such sites, short-term trips could be made for subsistence resources both on plateaus and in river valleys. The greater diversity in material types present in the Goyet and Spy collections is likely due, in part, to the palimpsest nature of the deposits, resulting from multiple occupations. However, flint from the nearest sources (Hesbaye flint for Goyet, Obourg and gray flint for Spy) dominates. The diversity of material types could indicate the suitability of Zone 2 sites for re-occupation, with the material types representing flint coming from different directions to the sites. In contrast to Le Trou Magrite, these Zone 2 Aurignacian sites suggest the establishment of a pattern of site distribution that permitted regular procurement of flint, as well as shelter and access to a range of subsistence resources on the plateaux and in valleys of Middle Belgium and the fringes of Upper Belgium.

Gravettian

The two Gravettian sites studied, Maisières-Canal (c. 28,000 years BP) and Huccorgne (28-26,000 and 24,000 years BP), are not representative of Gravettian sites in Belgium, which are mostly in caves, but represent rather the first known *in situ* open-air sites during the Early Upper Paleolithic. The Gravettian in general is less well-represented in Belgium than the Aurignacian. Apart from the two open-air sites studied, both found in Zone 1 contexts, all of the other sites (again excepting Le Trou Magrite) are found in Zone 2. This would appear to reflect a continuation of the same pattern of site distribution as during the Aurignacian, with the addition of a new strategy for flint procurement, namely open-air occupations located at or within a few kilometers of good-quality flint. Such sites would likely have had the purpose of obtaining both raw material and subsistence resources, with transport of material to

"residential" sites. It should be noted that, at least in the Méhaigne Valley, cave sites (Grotte du Docteur, Abri Sandron, Grotte de l'Hermitage, etc.) were occupied during the Mousterian and Aurignacian periods but apparently not during the Gravettian, although the site of Huccorgne is adjacent.

Summary

The existence of similar ranking and similar assemblage structure corresponding both to the three raw material ranks in Sclayn Level 5 and Level 1A and to the EUP sites studied suggests continuity in patterns of procurement and transport across the MP-UP transition. In all cases, the top-ranked material comes from the nearest sources, whether it is the local quartz in Sclayn Level 5, local flint at Maisères-Canal and Huccorgne, the nearest non-local flint at Sclayn Level 1A, Spy and Goyet, or local limestone at Le Trou Magrite. Rank 2 materials were materials in active use by human groups prior to their occupation of each site and can be seen as active toolkits, containing cores, which were perhaps transported in anticipation of a lack of local flint at the sites occupied. Rank 3 materials are generally whole tools, often reflecting more elaboration, preparation and increased intensity of resharpening, and blanks, with no evidence of reduction activity at the sites studied. These are interpreted as long-curated tools, used over a period of time from site to site, much as archaeologists keep their personal Marshalltown trowels.

The principal difference lies in the range of raw materials used during the Middle and Late Mousterian and the EUP (comparing Sclayn Level 5 with Sclayn Level 1A and EUP sites). There is a clear shift from the exploitation of a range of non-flint materials (quartz, quartzite, chert, Brussels sandstone) to flint-dominance in the assemblages. In Sclayn Level 5, non-flint materials are dominant, quartz is Rank 1 and flint comprises only 15% of the assemblage, ranked third below chert and quartz. In Sclayn Level 1A, the range of lithic materials is much closer to that observed in EUP sites: flint comprises 70% of the assemblage and non-flint materials are poorly represented.

This suggests a change in quality requirements, where the quality of local non-flint materials was sufficient during the Middle Mousterian (at 100-130,000 BP) but not during the Late Mousterian and after. Beginning with the Late Mousterian and afterwards, the higher quality of non-local flint offset the increases in time and energy expenses to procure it.

The second observable change in procurement strategy in Belgium occurs with the appearance of the Gravettian. While the same sources appear to have been exploited during both the Aurignacian and Gravettian, extensive open-air sites, such as Maisières-Canal and Huccorgne, are found near flint sources, in Zone 1. At such sites, particularly Maisières-Canal, this suggests a more sustained effort to obtain greater quantities of flint for the cave sites. This may have been in response to deteriorating climate as the Last Glacial Maximum approached.

There thus appear to have been two phases of change, with a shift occurring during the Late Mousterian (c. 40,000 yrs ago) and another with the appearance of the Gravettian (c. 28-30,000 yrs ago). The first is a shift in quality requirements, where non-flint materials drop out of the range of suitable lithic materials. The second is a shift in lithic procurement, with the establishment of more extensive open-air sites at or very near sources of good quality flint.

In sum, the Belgian record suggests that some behavioral change with respect to the lithic economy occurred *during* the Middle Paleolithic while Neandertals were still the only hominids in Europe *and* that other changes occurred some 10,000 years after the so-called Middle to Upper Paleolithic transition, with no apparent relationship to a biological change among the hominids. Against the background of a fixed geography and lithology in the territory of Belgium, certain solutions to the lithic, subsistence and shelter problems of prehistoric foraging people obtained throughout the Pleistocene; selection of one or the other varied with

time as the region was reoccupied, but only within narrow parameters. Proof of this is seen in the establishment of a pattern of Magdalenian sites c. 12.6 kya that was very reminiscent of the Gravettian pattern.

During the Belgian Magdalenian, more sites are found along the upstream Meuse and Lesse Valleys, in a region previously considered to be Zone 3, too distant from flint sources to be regularly provisioned with flint. In addition, there are clear open-air flint workshop sites (e.g., Orp and Kanne) on the plateaus. Such a change reflects a fundamental change in the way Magdalenian groups managed lithic resources, a fundamental change in lithic economy, probably related in large part to changes in mobility, that permitted Magdalenian groups to occupy a region largely empty (apart from Le Trou Magrite) before the Last Glacial Maximum. Other evidence suggests long-distance connections (seasonal migration, contact with other groups, exchange) with the Paris Basin and the German Rhineland, again indicating greater freedom of movement allowed by more effective management of lithic resources.