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De Loecker, Dimitri; De Loecker, Dimitri; Fennema, Kelly; Oberendorff, Medy

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DIMITRI DE LOECKER

BEYOND THE SITE

THE SAALIAN ARCHAEOLOGICAL RECORD AT MAASTRICHT-BELVÉDÈRE (THE NETHERLANDS)

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"De wetenschap is geen perfect instrument, maar het is wel het best mogelijke instrument. Net zoals de democratie niet het perfecte, maar wel het best denkbare systeem is."
(van Springel 1999:4).

Contents

1 Introduction

1.1 From Site A to Site N

The former Belvédère gravel- and loess pit is at the present time part of a 280 ha. area situated northwest of the Dutch city of Maastricht. The area, which is called Belvédère in general, is at the moment a hot topic of discussion, as it forms one of the main re-structuring zones for the town of Maastricht (Beek 2001*a* and *b*; Mertens 2001). The local landscape consists in the east of floodplains (*uiterwaarden*) of the river Meuse (Maas) and of the *Zuid-Willemsvaart* canal, and in the west part of the so-called Caberg-plateau edge (Meuse terrace landscape) is present. In the south and north there are, respectively, parts of the old Maastricht defence-walls and former dumping grounds. In this mosaic of housing facilities, industrial grounds, agricultural land, cultural and natural monuments and rubbish dumps, part of the oldest occupation of The Netherlands was documented.

Since the first half of the 19th century until the 1990s the Belvédère area, or better the Caberg region, was intensively commercialized by amongst others 'small-scale' brick-yards, which exploited the local loess and gravel deposits (van Rooij *et al*. 2003). In fact, due to these firms, large parts of the Caberg-plateau edge were quarried away to a depth of 10-15 metres (van Kolfschoten and Roebroeks 1985; Roebroeks 1988; Mertens 2001). In addition the quarries created small 'windows into the past', which enabled geologists, palaeontologists and archaeologists to study the Quaternary deposits. In the light of this research the Belvédère pit was given specific attention between 1980 and 1990, as *in situ* Middle Palaeolithic artefacts and faunal remains were discovered in the Saalian and Weichselian horizons. Inspired by these finds, systematic explorations of the pit sections were carried out and archaeological excavations took place on a yearly basis by Leiden University. This resulted in the documentation of a number of loci (from Site A up to Site N), where Middle Palaeolithic foragers discarded their flint implements during short term activities.

During that period, from 1985 onwards to be exact, the author was fortunate to participate in the annual excavation programme, as a student. Interested in the former presence of an extinct species of early human, fascinated by the lithic reflections of Middle Pleistocene hunter-gatherer behaviour (both typo/ technologically and spatially) and inspired by amongst others Mr Wil Roebroeks, Mr Paul Hennekens and Mr Nathan Schlanger a Master's thesis was written on the flint technology of the 1986-1987 excavations at the Saalian Site K (De Loecker 1988). This exercise in lithic analysis and conjoining of flint knapping sequences resulted eventually in a number of site-orientated publications (De Loecker 1992, 1993, 1994*a* and *b*). The main questions in these articles were, and still are, what can the Site K locus tell us about Middle Pleistocene hominid behaviour in terms of the (functional) character of the site, and what does it say about the settlement system in which the assemblage was formed. Moreover, we came to realize that if we wanted such questions answered, we should leave the 'site-level' and integrate all the available 'contemporaneous' data from the Maastricht-Belvédère sequence in the analysis (an 'off-site' approach *cf.* Foley 1981*a* and *b*; Isaac 1981). In other words, we should treat the find distribution(s) as part of 'one single' system in our search for mobile Middle Palaeolithic foragers, as they performed different activities at different parts of the former landscapes (*cf.* Roebroeks *et al.* 1992, see also De Loecker and Roebroeks 1998). At Belvédère it seems possible, meaningful and legitimate to compare for example Site K with other find occurrences, as they were all recorded from the same fine-grained fluviatile (local) Unit IV-C sediments (see Chapter 2). In addition, it is assumed that the several sites excavated in this unit do indeed belong to one and the same 'cultural system' (Roebroeks 1988:133). The findspots are probably contemporaneous in Pleistocene terms, having been formed during a relatively short phase within the same warm-temperate Saalian interglacial period. Furthermore, the find distributions were documented in a rather small area, which would suggest that they were formed under the 'same' micro-environmental conditions and that there are no reasons to assume that any significant changes in raw material availability had taken place. Precisely these research conditions were the inspiration for the long-lasting field efforts and created the right setting for the analysis 'beyond the site' or better the analysis of a technological landscape.

1.2 Beyond sites: theoretical background

In the closing years of the 18th century, in 1797 to be exact, John Frere discovered some flints (Acheulian handaxes) at

the small Suffolk village of Hoxne, England (Daniel 1972:10; Roe 1981:19-20; Wymer and Singer 1993*a*:1-22). The implements were deeply buried in undisturbed Pleistocene deposits and were stratigraphically located beneath a bed of sand, containing shells, remains of marine creatures and bones of extinct animals. These observations led Frere to infer that the lithics were man-made and that they must have been of great antiquity. In a small report he concluded:

> "They are, I think, evidently weapons of war, fabricated and used by a people who had not the use of metals.… The situation in which these weapons were found may tempt us to refer them to a very remote period indeed; even beyond that of the present world." (Frere 1800:204-205).

With this last sentence he suggested that the implements dated from earlier than 4004 B.C., then generally considered as the date of creation of the earth (the literal truth of the Bible). Although the full significance did not become apparent for sixty years, Frere's publication set the stage for (Lower) Palaeolithic archaeology as we know it today. Moreover, as the Hoxne artefacts were clustered in time and space, he made an early attempt to interpret the lithics in terms of 'human' behaviour: "The manner in which they [the handaxes, DDL] lie would lead to the persuasion that it was a place of their manufacture and not of their accidental deposit." (Frere 1800: 205).

During the first half of the 19th century, scientists of various disciplines moved slowly towards an acceptance of humanity's distant past. Until the 1850s-1860s archaeological research was mainly focused on the stone tool debate and the search for evidence in favour of the existence of fossil-man (then called pre-Adam man). For this purpose numerous sites across Europe were examined and many stone tools were recovered, sometimes associated with extinct animal bones (see amongst others Daniel 1972 and Roe 1981). In the end it was Jacques Boucher de Perthes who presented the 'key' that opened up the debate. Boucher de Perthes had spent several decades studying the gravel quarries near Abbeville and Amiens in the Somme Valley (Northern France). During his investigations huge quantities of artefacts, including Acheulian handaxes, were recovered at a number of locations (amongst others at Saint-Acheul). Because of their provenance from undisturbed deeply stratified gravel deposits (old river sediments), which also contained bones of extinct animals, he strongly defended the idea that the extinct animals must have lived at the same time as the tool-makers. Consequently fossil-man must have existed. Although Boucher de Perthes' discoveries were ridiculed in France, his claims were taken more seriously across the English Channel. In 1859 the respected British scientists Hugh Falconer, John Evans, Joseph Prestwich and Charles Lyell visited Boucher de Perthes at Abbeville (Daniel 1972:12; Roe 1981:22). They were immediately convinced by the stratigraphic evidence that early humans and extinct mammals co-existed. Moreover they recalled the work of Frere at Hoxne, which convinced them of the high antiquity of humans. All in all, this high academic attention given to northern French 'stones and bones', together with the 'new' findings at Brixham cave (Windmill Hill Cavern) near Torquay in Devon, England (Prestwich 1873; Pengelly 1874; Evans 1897:512; Daniel 1972) and the earlier discovered fossilised human remains at Engis in Belgium (1829-30), Forbes' quarry in Gibraltar (1848) and Feldhofer Cave, Neander Valley near Dusseldorf in Germany (1856), established the general recognition of fossil-man. The same year (1859) Charles Darwin's *On the Origin of Species* was published, and in Glyn Daniel's words "4004 B.C. was forgotten" (1972:12).

From the second half of the 19th century onwards until the 1960s, archaeologists were building mainly on that premise and new evidence of man's physical and cultural develop-ment was presented. By studying the Palaeolithic remains, which were collected and excavated from geological sections, cave sites and open-air sites, research initially focused on the construction of a reasonable chronology in which the recovered material culture could be placed. Prehistorians were in fact filling in the gaps of the time-space continuum and eventually a broad outline of human cultural development, linked to specific stone tool use, was established (*cf.* early hominids and pebble tools, *Homo erectus* and handaxes, and modern humans and blade tools). Although artefact descriptions were loaded with functional terms (based on modern tool analogies), such as borer, knife, axe, spear point, saw, etc…, little attention was actually given to early human behaviour in terms of the functional character of the sites. One of the earliest efforts to translate vast quantities of recovered material into behavioural patterns was made by Worthington George Smith in the 1880s and early 1890s (Wymer 1968; Roe 1981). In fact Smith can be seen as the 'godfather' of modern Palaeolithic archaeology. Like archaeologists today, he collected every fragment of worked flint rather than selecting just the best pieces, he recorded accurately the provenance of the artefacts, he drew sections and commissioned photographs of geological features and he skilfully illustrated his finds. Moreover, he used a very systematic and detailed refitting analysis (*cf.* Spurrell 1880*a* and *b*; Smith 1881) to make inferences on early human behavioural patterns (Smith 1892, 1894; Evans 1897:598-600). In *Man, the primeval savage* (1894:126-128) Smith described amongst others the elaborate conjoining and 'replacing' of the Acheulian flint assemblage at Caddington, on the border between Hertforshire and Bedfordshire (England). He used the

gathered information to interpret and reconstruct many aspects of Palaeolithic life.

"It is remarkable that some of the cores found by me are of a certain colour, or naturally marked in some peculiar way, and that no flakes of a similar colour or marking have been found. I assume that the flakes were struck off these cores for some special purpose, and carried to some other position not lighted on by me. Again, some flakes are of a peculiar colour, or naturally marked in a special way quite distinct from any core; these flakes, I suppose, must have been struck off elsewhere, and brought to the spot examined by me." (Smith 1894:128).

Besides these interpretations on artefact transportation he also made inferences on recycling, (re)sharpening and modes of flake and tool production/manufacture. In fact his analysis was a reconstruction of reduction schemes *avant la lettre*. Smith not only applied refitting to the Caddington site, he also used the method at the so-called 'Palaeolithic floor' or buried land surface in Stoke Newington Common in North London (Smith 1883, 1884, 1894). Again this 'floor' was excavated with great care and consisted of many flint tools and flint-working debris. He concluded that the tools were discarded at close distance to the place where they were last used, suggesting the *in situ* character of the site, and he reconstructed some behavioural patterns which were 'sealed' in the material culture.

Much light has been thrown on many points by Worthington Smith, but his comprehensive working methods and interpretations remained rather unique until the mid 20th century. Although in general a shift was noticed from section based research to the description of artefact distributions recovered from stratigaphically discrete but laterally extensive sedimentary units, behavioural interpretations and their spatial reflections remained rather limited. Until the 1960s, archaeologists were mainly concerned with geological questions, dating problems and artefact descriptions. They primarily recorded what kind of bones and artefacts were found at a site (morphological and typological interpretations) and secondarily described the similarities and differences (kinds and quantities) compared to other sites. In fact this practice did little to explain. Researchers mostly presented their behavioural (and spatial) understanding of the remote past by (re)creating 'dynamic' images of the daily lives of ancient human ancestors. Usually early humans were romantically depicted as groups of skilled hunters, gatherers and/or scavengers. They were mostly visualized during the actual killing of an animal, the dismembering of animal carcasses, flint working activities or as families performing several activities at a kind of base camp. Actually, these reconstruction drawings were sometimes the only behavioural inferences that resulted from years of very intensive research.

In the mid 1960s, many (younger) archaeologists became disenchanted with traditional archaeology. The main complaint was that archaeology described a lot but did not seem to explain very much. At that time the archaeological models were fine for reconstructing the history of the site, but were inadequate when it came to actually explaining the changes that occurred in the past. Moreover, until then research techniques focused on simply accumulating more data. The general idea was that when enough data was accumulated, the interpretation would be clear. The modern approach to the problems of archaeological interpretations was called *New Archaeology* (Binford and Binford 1968). The *New Archaeologists* argued that archaeology was a social science like anthropology and it should therefore explain the past social and economic systems, not just simply describe them. Through deductive reasoning, hypotheses and models were constructed to explain the given changes. These hypotheses and models were tested and only accepted on the basis of hard evidence. This meant that during the 1960s new excavation methods, involving more precise documentation of the finds, were introduced for Palaeolithic sites. Additionally, sampling methods, significance testing, and other methods of statistical computer analysis were initiated. Hypotheses on the reconstruction of past human behaviour and the settlement systems in which the archaeological assemblages were formed, provided directions for theory building in lithic studies. The 'new' sources used in lithic (and spatial) analysis were amongst others:

1. Experimental flint knapping pioneered by Don Crabtree (1972) and François Bordes (1961): Serious attention was given to different knapping techniques to produce ancient artefacts. The work mainly focused on the description of flaking mechanisms and the reproduction of steps in the reduction of specific artefacts. Lithics were placed in groups, based on their role in the manufacturing and use process (discard, rejects, used tools, rejuvenated tools etc…).
2. Refitting analysis: Through the innovative use of the method at Pincevent (Leroi-Gourhan and Brézillon 1966) it became clear that the potential of refitting exceeded reconstructing procedures of flake or blade manufacturing and so the method became crucial in behavioural and site analysis.
3. Use-wear or micro-wear analysis pioneered by Sergei Semenov (1964) and Lawrence Keeley (1980): With the introduction of microscopic traceological analyses archaeologists started answering elementary questions regarding the stone tool function (relationship between tools and worked materials). As a result they were able to identify some of the activities performed by prehistoric humans; the fundamental analytical data for understanding the organization of ancient technological behaviour.

These 'new' analytical sources, together with a basic knowledge of anthropology and the use of ethnographic parallels (see amongst others Lee and De Vore 1968; Binford 1980, 1983, 1984*c*, 1986, 1991; Binford and O'Connell 1984), became essential to help explain cultural patterns in the Palaeolithic record. In other words, the so-called ethno-archaeological approach provided opportunities to answer questions on past subsistence strategies and the spatial patterning of activity areas (*e.g*. Cahen *et al.* 1979; Van Noten *et al.* 1980). Moreover, since archaeologists became conscious of the fact that (early) human behaviour is spatially continuous, archaeological interpretation went beyond the 'site boundaries' (whatever that means).

The scientific interest in reconstructing dynamic early land use patterns can be traced back to the evolutionary question: what distinguished early members of the modern human genus from apes? Since the 1970s, there has been a tendency to emphasize the uniqueness of human behaviour (Binford 1981; Mellars 1991). In their quest, palaeoanthropologists and archaeologists focused on shifts in diet, foraging strategies and ranging patterns to discriminate the hominid lineage (Stern 1991). Initially, research was concerned with the significance of hunting ('*Man the hunter*' or 'hunting' hypothesis, *e.g*. Lee and De Vore 1968; Ardrey 1976), but rapidly became extended to other aspects of social organization and behaviour. Fundamental topics in these discussions were amongst others food-sharing, settlement patterns, technological complexity and/or flexibility, resource utilization, spatial patterning of technological behaviour and the presence or absence of symbolic reflections (Isaac 1978*a* and *b*; Mellars and Stringer 1989; Binford 1981; Klein 1992; Gamble 1993).

One of the most influential land use models in Plio-Pleistocene archaeology was presented by Glynn Isaac. In a response to the 'hunting' hypothesis, Isaac (1978*a* and *b*) argued in favour of a 'food-sharing' model. His statements used to identify the uniqueness of early humans were based on a comparison between the daily movement patterns of modern hunter-gatherers and those of non-human primates. In contrast with the 'feed-as-you-go' strategy of non-human primates (*e.g.* Goodall 1986) "the food-sharing hypothesis describes a behavioural system in which more mobile members of a social group ranged over large distances in search of difficult-to-catch and small but high protein packages of food, while less mobile members of the group range over smaller areas gathering staple plant foods. At least some food resources were not consumed as they were acquired, but were transported to a central place for processing and shared consumption." (Stern 1991:4). Moreover, a sexual division of labour was suggested[1]. The crucial thoughts behind the model were that food and stone technologies were brought back to a predetermined focal point in the landscape for the purpose of various activities (similar to modern hunter-gatherers performances). This central point was classified by Isaac as a 'home base' (Isaac 1978*a* and *b*). The activities involved resulted eventually in the accumulation of broken-up animal bones and discarded lithic artefacts, sometimes associated with evidence of early *Homo*.

The research programmes initiated in the 1970s at Koobi Fora and Olduvai Gorge (Great Rift Valley, respectively Kenya and Tanzania) were designed to test Isaac's proposed 'food-sharing' or better 'home base' model (Isaac 1984). Previously, excavations in these geographical areas had uncovered vast concentrations of lithic artefacts which were associated with abundant faunal remains. They occurred in distinct volcanic horizon layers and were dated to around 2 million years ago. For years Louis and Mary Leakey had termed these assemblages "living floors" or "living sites", places where early humans slept, produced tools and butchered animals (Leakey 1971; Isaac 1978*a* and *b*). The social structure of modern hunter-gatherer 'campsites' was used as a blueprint for past behaviour. This, however, carried the implications that archaeological debris was deposited on a ground surface within one or more 'contemporaneous' events and that different areas functioned simultaneously. Moreover, the 'living floor' model was insufficient in explaining the behavioural patterns which created the assemblages. One of the main motives in the development of the 'food-sharing' hypothesis in Isaac's argumentation was amongst others based on a detailed raw material study. The given assemblages suggested that many stone tools were transported by early humans to specific places. In addition, he was sceptic about the idea that the large piles of excavated faunal remains were the result of killings that took place with short time intervals at the specific locations. This led him to the conclusion that the 'stones and bones' were transported to the chosen 'home-base' localities (Isaac 1978*a* and *b*). Other sites were seen as butchery locations and caches (Potts 1988), while lithic assemblages with few faunal remains were explained as stone tool manufacturing loci.

The 'home base' model was instantly attacked by Lewis Binford (1981, 1984*a* and *b*, 1985, 1987*a*, 1988; Binford *et al.* 1988). His detailed (microscopic) analysis of the African animal bones revealed cut marks of stone tools as well as gnawing traces of carnivore teeth. This indicated that both human and predator behaviour (like lions and hyenas) were involved in the formation of the African Lower Palaeolithic record. Additionally, the evidence suggested that the 'integrity' of the sites, as undisturbed archaeological 'living floors', had not been established. The time period in which the artefacts had accumulated was unknown and therefore the relationship between the lithics and bones was suspect.

Binford assumed that the high densities of discarded material had been built up over a long period of time (*i.e*. palimpsests). A statement which is incompatible with the interpretation as so-called 'central places' or 'home bases' (Binford 1987*a*). Moreover, in his taphonomic reanalysis[2] of the bone assemblages (Binford 1981), he concluded that early humans did not actively hunt and carried meat back to base camps. Instead they scavenged and processed meat and marrow (by breaking open bones) from carcasses of animals that had died either a natural death or had been killed and deserted by predators. In Binford's view scavenging could not have provided the extra food needed for sharing.

All in all, researchers became to realize that inferring the *in situ* character of artefacts, or assuming associations between different find categories are tricky. The archaeological record should not be seen as static, but as part of a dynamic natural system that is constantly being changed and reworked. The processes involved must be understood before the excavated data are used for behavioural interpretations. What is more, the 'home base' ('living floor') – palimpsest dichotomy set the stage for a large number of detailed studies (mainly performed by Isaac's students), directed towards Palaeolithic taphonomy and site-formation processes (*e.g.* Schiffer 1972, 1976, 1983, 1987; Hofman 1986; Schick 1986, 1987; Nash and Petraglia 1987; Goldberg *et al.* 1993). The fundamental questions to answer were (and still are): how and why had the recovered dense assemblages been formed? Had they accumulated in a few hours or days (possible related visits)? Or were they the result of short occasional human and/or animal visits spread over long periods of time (palimpsests of unrelated events)? On the one hand the analytical approaches focused on natural post-depositional processes that could have affected the archaeological record, including biological[3], physical[4] and chemical agents[5]. On the other hand it was realized that also cultural (behavioural) processes can create palimpsests of evidence that accumulated over time. Humans sometimes deliberately or accidentally altered or destroyed the archaeological context[6]. So, motivated by the ongoing Isaac – Binford debate, the newly trained generation of researchers charged at the East African dataset using taphonomy as one of their major 'weapons'. Although no big surprises emerged, several alternative (mostly adaptations of existing) land use models were presented (Sept 1992:9). The general conclusion was that the horizontal patterning of lithic artefacts and faunal remains represented locations in the landscape where early human hunter-gatherer-scavengers carried out a clearly defined set of activities. This positioned them behaviourally apart from their primate ancestors.

The Palaeolithic or technological landscape can be seen as a continuous distribution of archaeological material, in which variable densities spatially occur[7]. 'High' concentrations of debris are mostly present against a background of 'low density' distributions, covering isolated or small sets of artefacts. Moreover, the 'high density sites' are normally the target areas for excavation, while the 'low density' phenomena seem to connect these dense clusters. Quantitative and qualitative characterisations are used to discriminate the different find occurrences from one another. As Holdaway and Fanning stated:

> "The temptation is to see this artifact carpet as the remains of a once active settlement system and, by identifying site types, to attempt to determine the reasons why particular locations were occupied. The result is a functional and largely synchronic view of landscape use wherein a number of locations are seen to operate together as a coherent whole." (Holdaway and Fanning 2004:3).

During the 1970s, while building and testing his 'food-sharing' – 'home base' model, Isaac initiated 'the scatter between the patches' project (Isaac and Harris 1978; Isaac 1978*b*, 1981). The research aims were the documentation of the distribution and nature of lithic artefacts. Essentially, he categorized four or five types of configurations in the East African Plio-Pleistocene landscape (*cf.* Isaac and Harris 1978; Isaac 1978*b*, 1981; Isaac and Crader 1981; Isaac *et al.* 1981; Stern 1993). Due to variations in quantity and composition they were described as different types of 'sites', suggesting distinct behavioural patterns. The diversity ranges from 'high density' patches of stone artefacts associated with bones from several different animal species (Isaac's so-called 'home bases' 1978*b*, 1981), through concentrations of lithics associated with bones from a single large animal, and lithic clusters without the associated bones (or *visa versa*), up to the 'low density scatters' of lithic artefacts and/or bones. Later on, Isaac proposed a hierarchy of levels for structuring and understanding these spatial configurations (Isaac 1981, see also Chapter 5.2). He organised the Early Stone Age relics according to density and spatial patterning, which resulted eventually in four basic levels: isolated artefacts (level 1), single action clusters (level 2, *i.e*. 'mini sites' [Isaac *et al.* 1981]), clusters of clusters or complex groups of level 1 and 2 occurrences (level 3, *i.e*. the dense artefact patches), and the total regional configuration of these 'visiting cards' (*i.e*. patterned set of all scatters and patches, level 4). What Isaac eventually suggested was that there may be significant functional differences between the 'high density' patches (his supposed 'home bases', butchery and/or quarry locations) and the thin, diffuse scattered surface between these places. Focusing on tool compositions, the latter were thought to represent recurrent activities possibly associated with foraging activities.

Like in Binford's earlier attack(s) on the 'home base' model (Binford 1987*a*; see also above), Nicola Stern

questioned the 'integrity' of the 'high density' distributions, as undisturbed patches (Stern 1991, 1993, 1994). Stern's study of the 'high *versus* low density' distributions focused amongst others on the composition and characterisation of the assemblages. She suggested that the main discrepancy is density and that there are no functional differences between them (Stern 1993:210). The 'stone and bone' patches should not be seen as records of particular events, but simply as bulky assemblages consisting of archaeological debris (scatters) which accumulated over tens of thousands of years. In conclusion Stern stated:

> "Clearly, it is possible to identify stratigraphically discrete, but laterally extensive sedimentary horizons that contain sufficient archaeological debris that they can be used to study the differential distribution of material remains across an ancient landscape. However, the archaeological materials contained in these horizons are time-averaged palimpsests." (Stern 1994:102).

Although the East African Palaeolithic record can be seen as a palimpsest (Stern 1993, 1994), Isaac's 'scatters and patches' approach stresses at least the analytical (comparative) importance of treating the 'high and low' artefact distributions as parts of 'single system' (see also Foley 1981*a* and *b*). Before interpreting the excavated locations in terms of social organisation and land-use patterns, taphonomical studies should decide whether this system (or part of it) is the product of post-depositional agents or (in combination) the result of early human behaviour. It is however clear that we need to overcome the 'solitary site' focus if we want to learn more about the spatial movements of Palaeolithic hunter-gatherer-scavengers. People exploit(ed) the complete landscape and therefore limited 'site-orientated' views would narrow the understanding of prehistoric life. Consequently, the 'low density scatters' and 'high-density patches' should be treated equally. Moreover, we should realise that "we are probably looking at an archaeological landscape generated episodally and not the remains of a cultural geography wherein populations operated out of 'camps' into an environment, as do modern human populations." (Binford 1987*a*:29).

At Maastricht-Belvédère it seems possible and legitimate to compare the *in situ* Saalian artefact (and minor faunal) distributions. For various reasons mentioned above (see also Chapters 2 and 5.3), the excavated find occurrences appear to be contemporaneous in Pleistocene terms. In addition, this could indicate that we are dealing here with the discarded material remnants of a once active early human land use system.

Research of the local Pleistocene sequence initially started as a small scale project, focusing on individual artefact discoveries, geo-archaeological section observations and 'site' orientated studies. Over the years it developed into a comprehensive and multidisciplinary research project, in which the focal point altered towards the excavation and analysis of large continuous artefact distributions. The long lasting field efforts, which resulted in several excavated areas, showed that there are clear spatial differentiations in the artefact density. Influenced by the work of Isaac (1978*b*, 1981; Isaac and Harris 1978), the recovered assemblages were described as so-called 'high density patches' and 'low density scatters'. Initially the research questions were (and still are) directed towards the 'integrity' of the recovered assemblages[8]. In other words, the information value of the find distributions, for reconstructing early human behaviour, was put into question. Secondarily, if these findspots could indeed be understood as 'undisturbed' archaeological phenomena, what did they teach us about the subsistence settlement system in which they were formed? To obtain answers to such questions an effort was made to 'unlock' the information hidden in the lithic find occurrences. In-depth artefact studies (*i.e.* detailed lithic descriptions and elaborate refitting analysis) proved to be vital, while comparing the created data-sets with one another, subsequently, illuminate the inter-'site' variations.

Spatial variations in artefact density are in general easy to observe. It becomes however more complicated when other discrepancies between the Maastricht-Belvédère 'scatters and patches' are to be traced. At first glance the recovered assemblages look very similar, as typological and technological differentiation is limited. In addition, the overall tool and core quantities are low, and variation is again limited. On top of that, the assemblages show no clear distinction in the used raw materials. The performed lithic exercise showed eventually that the main discrepancies, beside density, were to be found in fine-tuned typo-/technological variations (differences in percentages and ratios). At the same time, quantitative and qualitative refitting studies proved to be fundamental in attesting these fine-grained dissimilarities (De Loecker *et al.* 2003). In short, the 'scatters and patches' seem to reflect essentially one technological (flake) strategy that was based on the regular transportation of prepared cores and flakes (Roebroeks 1988; Roebroeks *et al.* 1988*b*). A number of spatial configurations reflect, however, a more expedient technology than others. Conjoining studies demonstrated that some artefact distributions represent core reduction sequences that largely overlap spatially, whereas others represent sequences that succeeded each other both in space and time. On the whole, the assemblages collected from the Belvédère sequence provided a set of valuable comparative data. This detailed information was used to interpret the large-scale and continuous artefact distribution, referred to as a 'veil of stones' by Roebroeks *et al.* (1992), which displays some internal variations in both artefact density and composition. Due to the fact that the majority of

Early Stone Age sites mainly consists of lithic implements, a better understanding of the *chaîne opératoire* (Perlès 1985; Pellegrin *et al.* 1988; Boëda *et al.* 1990; Sellet 1993) is vital in our search for behavioural patterns. Moreover, without the use of a detailed typo-/technological description, in combination with a thorough conjoining study, a large part of the minute differences between the Belvédère 'scatters and patches' would have remained uncovered. Like Stern stressed in her PhD thesis:

"… improved understanding of the foraging strategies and land use patterns of early tool using hominids will ultimately be based on very fine grained analyses of archaeological debris and its palaeogeographic and micro-environmental context. The goal of future research … is to reconstruct the microhabitat context of archaeological debris in sufficient detail to gain a handle on the spatial and temporal variations of recourses and other factors known to influence the foraging and land use patterns of … hunter gatherers." (Stern 1991:8).

We have come a long way since the first human implement recognition by Frere and de Perthes (Frere 1800; Daniel 1972; Roe 1981). Through the revolutionary work of Smith (1894) and the innovative impulses of *New Archaeology* (Binford and Binford 1966) a setting was created for behavioural theory building. However, the Isaac – Binford debate (see above for references) shed light on taphonomy and site-formation processes and illustrated that we should be very cautious with the integrity and interpretation of early settlement (land use) systems. Nevertheless, it became clear that if we want to understand past behaviour we should leave the 'single site' focus and concentrate on an analysis 'beyond the site'. This can ultimately spotlight the spatial dynamics of lithic artefact technologies, which are in most cases the only behavioural remnants traceable on a palaeo- landscape.

In general, the main target of this work is twofold. On the one hand the elaborate lithic inquiry (*i.e.* artefact descriptions and conjoining) offers a way of understanding and interpreting a technological landscape at Maastricht-Belvédère. The high density Site K patch offers in that way a starting point and can be seen as a 'key site' in this thesis. On the other hand it provides a unique dataset, which can be generally used for future comparative research. Therefore, this study can also be seen as a detailed site-report.

1.3 Tackling the problem: lithic analysis and spatial pattering

As mentioned before, the conjoining of artefacts together with a lithic analysis, that is a careful typo-/technological description of artefacts, proved to be an essential 'tool' in the understanding of the Maastricht-Belvédère flint assemblages. Although refitting analysis has been known to be a valuable tool for site analysis for more than a century (see De Loecker *et al.* 2003 for an overview), it is only seldom being explored systematically for the interpretation of stone age sites and technologies. In most research projects such interpretations are based on lithic analysis alone, or refitting is only applied to a small sample of the assemblage. As conjoining and lithic description programmes are time consuming, and as recent archaeological projects are increasingly being designed to minimise time budgets and costs, the implementation of such an analysis may even be considered less favourable in future stone age research. Where refitting covers integral assemblages, however, its value for reconstructing both site taphonomy and human behaviour is well attested. It may even be argued that refitting is a must for reconstructing prehistoric lithic technologies (De Loecker *et al.* 2003). The elaborate flint artefact description, executed by a single person and having therefore a constant 'error', proved to be mainly valuable to pinpoint the small-scale typo-/technological differences between the so-called 'scatters and patches', as I will demonstrate below. If a lithic analysis only would have been used, the processes of production, use and re-use would have remained hidden, many technological details and peculiarities would not have been observed, and the spatial dynamics of technologies, both on site and inter-site level, would have been overlooked. A combination of both mentioned analytical tools used for the intra-Saalian interglacial find levels at Maastricht-Belvédère shed new light on, amongst others:

1. the reduction processes of Middle Palaeolithic core technologies, including the choices made by early humans when confronted with irregularities in raw materials and flaking;
2. the often complex life-histories of single stone tools in the process of production, use, re-use and recycling;
3. the use of space by early humans on the local level, resulting in a 'veil of stones' (*i.e.* Roebroeks *et al.* 1992) which consists of both high and low density artefact scatters;
4. the spatial organisation of technology when viewed from an inter-site/(micro-)regional level;
5. the taphonomic histories of Middle Palaeolithic artefact distributions, including the post-depositional horizontal and vertical displacement of lithic materials.

The results of Belvédère imply that, although refitting and lithic studies are time consuming, they should be applied, where possible, in combination to improve the quality of interpretation.

1.4 Reconsidering the data

Traditionally, archaeological research has focused on 'sites' to investigate material, economic, social and cultural behaviour (*i.e.* the 'site' as fundamental analytic entity).

When the concept archaeological 'site' is critically examined, its meaning seems to vary depending on the context in which the word is used. A site can, amongst others, be described as: a locus which is intentionally used by (early) humans; or a locus which is characterized by human deposition of activity remains; or a group of stone artefacts, sometimes associated with faunal remains, which were recovered together (*i.e.* an assemblage). Additionally, there are definitions centred around density criteria (quantity per square metres), physical space (geographical area) and even research goals (*i.e.* the research questions direct whether certain phenomena should be documented as sites). The notion 'site' can therefore be regarded as overlapping, controversial and untrustworthy (Binford 1992; Dunnell 1992). Consensus on its definition will probably never be reached, since archaeologist excavate artefacts, bones, features, etc. and not 'sites'. This would suggest that archaeological 'sites' are illusions produced in the minds of archaeologists.

The roots of the 'site' controversy are probably to be found in landscape directed archaeology. Since human behaviour is spatially continuous, Palaeolithic archaeologists came to realize that hunter-gatherer activities have only a very small impact on the landscape. Generally their archaeological visibility can be considered as low. Moreover, it became clear that the excavated 'classic sites' represent only the most densely concentrated artefact distributions, and that palimpsest situations of unrelated events were not uncommon. The frequently neglected find distributions outside the excavated 'site' context suddenly became worthy of study and new complementary data on early human land use patterns were generated (*e.g.* Isaac 1978*b*, 1981; Isaac and Harris 1978). In contrast to the 'site' focus, this landscape perception[9] was orientated towards the archaeological integration of low density phenomena which were excavated 'outside' or 'between' the actual 'points'. In other words the research, commonly referred to as 'mini-site', 'non-site' or 'off-site' archaeology' (respectively Isaac *et al.* 1981; Thomas 1975; Foley 1981*a* and *b*), still focused on the dense artefact clusters, as they were actually seen as equivalents of 'settlements' or 'central points' in a behavioural land use system. The 'off-site' patterns were (and are) often simply described as 'background noise'.

As a result, the palaeo-landscape can be portrayed as non-stop artefact distributions consisting of high densities' ('sites') and 'low densities' ('non-sites'). In Isaac's terminology these are respectively 'patches' and 'scatters' (Isaac 1978*b*; Isaac and Harris 1978). Besides the problem of definition, the 'site' controversy is situated in the question: where do we draw the line between a 'site' and a 'non-site', if we want to analyse a continuous spatial distribution of archaeological remains? The determination of a clear quantitative 'cut-off' point (relative changes in artefact densities) is subjective and usually done by the archaeologist concerned. Such an arbitrary distinction could suggest that the methodological 'site-orientated' framework is founded on intuition, resulting therefore in theory building based on 'fiction'. Moreover, the 'site *versus* non-site' separation creates a black and white situation in which there is little place for the analysis of deviating occurrences, *e.g.* excavated surfaces which eventually turn out to be situated on the periphery of a 'site', or spatial overlaps of both phenomena. And what will happen, for example, if part of a technological landscape is excavated and only the low density 'off-site' patterns are used for analysis? Due to internal density differences we could probably still define a number of phenomena as 'sites'. It should be mentioned that the use of alternative concepts such as Isaac's 'scatters *versus* patches' seems problematic as well, and for the same reasons, *i.e.* they imply the existence of a 'site focus', they represent a black and white situation and a clear 'cut-off' point will have to be defined.

To analyse the cultural remnants of hunter-gatherer-scavenger land use activities, we should endeavour to practise an archaeology in which, at least at the methodological level, the traditional 'site' concept is banned. This means that we will have to regard the spatial distribution of artefacts as a sliding scale on a continuum (Gallant 1986; Roebroeks *et al.* 1992; Holdaway and Fanning 2004). Both high and low density patterns belong to the remnants of a cultural system, so they should be seen as a whole without discriminating one or the other. In this scenario the individual cultural items such as a flake, tool, core, bone artefact, feature, etc. are to be considered as the minimal unit for analysis (Thomas 1975). High density distributions of debris represent the other extreme of the continuum. This site-less archaeology confronts us, however, with a dilemma. In the absence of distinct spatial references that group supposed clusters into 'sites', it becomes very difficult to manage the mapped artefact distributions for the purpose of interpretation and comparison.

At Maastricht-Belvédère the excavated surfaces were traditionally named 'sites' (Site A, B. C, etc. according to the chronology of research). However, it is well clear by now that the 'site terminology' does not offer an adequate framework for analysing and interpreting the nature of the encountered patterns. Clearly these are not pinpointed occurrences (*cf.* Isaac 1978*a* and *b*). As it has become apparent from the excavations, large parts of the interglacial river Meuse valley bottom must have been littered with artefacts. This large-scale and continuous artefact distribution, interpreted by Roebroeks *et al.* (1992) as a 'veil of stones', show some internal variations in artefact density, composition and refitting potentials. However, for the sake

of consistency with earlier publications the site-terminology is maintained, but it should be noted that the term 'site' refers here only to excavated surfaces. This applies also to the notions 'locus', 'patch', 'scatter' and 'background noise', as they only refer to higher or lower densities in the continuous 'veil' of artefacts. These concepts must be seen only as useful 'tools' which will be used to analyse and compare the spread of archaeological remains.

Primarily, in this thesis the various excavated Belvédère areas will be treated as basic analytical units. They will be compared with one another secondarily. Careful analytical attention is given to the isolated finds (*i.e.* section finds), low density distributions and high density distributions. The archaeological manifestation of early human behaviour will only be studied after an investigation of taphonomy and site-formation processes. Analysis of the raw materials, technology and spatial configurations may ultimately help to define different functional mechanisms or behavioural episodes. On the basis of percentages, ratios, associated artefact densities and spatial dispersion, the different high and low density distributions will be compared and eventually the 'veil of stones' will be interpreted in terms of early human behaviour. It is important to realize that they represent only a very specific (valley) segment of the total settlement system (Kolen *et al.* 1998, 1999).

Much consideration is given to the 'site' controversy, but ultimately the 'veil' model appeared to be the most suitable for analysing a continuous artefact distribution at Maastricht-Belvédère. It can therefore be stated that the general methodological and theoretical framework should be reconsidered, and not the data.

1.5 Step by step

The Maastricht-Belvédère complex fluviatile deposits of the river Meuse and the younger aeolian sequence have been studied archaeologically and geologically for many years. These studies have resulted in the definition of a number of lithological and lithostratigraphical units, which contained relics of Middle Palaeolithic early human occupation. After a short historical introduction, the Middle and Late Pleistocene sequence at Belvédère is briefly described in Chapter 2; dating and palaeoenvironmental data will be discussed. The most interesting archaeological levels, however, were embedded in fine-grained fluviatile sediments (Unit IV), with an approximate age of 250 ka. These deposits are present on top of a complex of terrace gravels, and are overlain by a series of Saalian silt loams and Weichselian loesses. This Saalian Unit IV will be described in slightly more detail. For a 'complete' picture of the local situation the reader is referred to van Kolfschoten and Roebroeks (1985), Vandenberghe *et al.* (1987) Roebroeks (1988) and van Kolfschoten (1990). These publications mainly represent the results of the first five years of investigation. During the period 1986-1990 additional geological, palaeontological and archaeological data were collected, resulting amongst others in a minor revision of the earlier presented lithological and lithostratigraphical framework (Vandenberghe *et al.* 1993).

As mentioned, the main archaeological level documented a full interglacial fauna associated with a 'rich' Middle Palaeolithic dataset, preserved within various sites over an area of about 6 hectares. Between 1981 and 1990 excavations were carried out every year, often under considerable time pressure and sometimes just ahead of the commercial excavation machines and by the end of 1990 eleven 'sites' had been excavated at the Belvédère locale. Some of these findspots were so well preserved that extensive refitting proved possible, *e.g.* at sites C, F (Roebroeks, 1988) and K (De Loecker, 1992, 1994*a* and *b*), and inferences on former *chaînes opératoires* could be drawn (Schlanger, 1994, 1996). One of 'richest' sites in terms of flint quantities and interpretation value is Site K. This so-called 'classic' site is analysed in Chapter 3 and its study created a scientific setting for a further analysis beyond the 'site-level'. In other words this findspot represents a key-site for this thesis. Chapter 3 presents a typo-/technological review, refitting exercise and spatial analysis of the lithic material. After a geological interpretation of the local sediments, the dating evidence and a discussion of the research methods, a summarized typo-/technological description of the flint artefacts is given. In total 10,912 flint artefacts were collected, consisting mainly of debitage. All stages of the reduction strategy, from collecting the raw material through decortication to the discard of cores and tools, are represented. The reconstructed technology can generally be interpreted as the result of a 'wasteful' reduction of non-prepared cores. Also a number of well-prepared tools, fabricated on 'exotic' flint, was probably transported to the locus, to be used 'on the spot'. Topics like raw material procurement, *ad hoc* production (-modes) of flakes, cores and tool, and transport of lithics will be discussed in different sections. Specific attention is paid to the results of the detailed refitting analysis. Subsequently, the artefacts, including the refitting results, of this 'rich' site are analysed and interpreted spatially. Whether this 'high density' site is exclusively the result of one consistent use of the place, or a palimpsest of several unrelated events is an important issue in the analysis.

For a comparison of the Site K results, Chapter 4 presents an introduction, a typo-/technological review, some refitting and spatial results and an interpretation of the lithic material from all Maastricht-Belvédère Unit IV findspots (Sites A, B, C, D, F, G, H, and N). Besides the artefacts from the excavated areas all stray-finds, collected in several (stratigraphically) different (long) sections and finds recovered during test pit excavations, will be dealt with as well (Sites L, M, O,

N [level X] and the 'July 1990' test pit). Furthermore, the 'isolated' section finds recovered during the ca. ten years of research will be described as one group of artefacts. It should be mentioned here that Chapter 4 contains some repetition of Belvédère data presented in earlier publications (*cf.* Roebroeks 1988; Roebroeks *et al.* 1992; Schlanger 1994). This was mainly done to give an overview, as accurately as possible, of the Unit IV archaeological remains. Excavations at Maastricht-Belvédère showed that parts of the former Meuse valley bottom must have been littered with artefacts and bones. This large-scale and continuous artefact distribution (referred to as a 'veil of stones' by Roebroeks *et al.* [1992]) displays some internal variations in artefact density and composition. Chapter 5 presents a survey of these variations and attempts to explain them in terms of early human behaviour. Here, topics such as transport or expedient production of flakes, tools and cores, which played an important role in the formation of inter-assemblage variability, will be treated. This chapter uses some elements of Isaac's (1981) 'scatters and patches' approach and is mainly based on the model published by Roebroeks *et al.* (1992). The model stresses the equal importance of scatters and patches and shows that the find distributions should be treated as parts of 'one' single system in our search for Middle (Lower?) Palaeolithic patterns in the former landscapes.

The information potential of the scatters and patches in the Meuse valley, discovered at Belvédère, may eventually be more fully realized when compared to Middle Palaeolithic find occurrences in nearby regions (see Roebroeks 1988; Kolen *et al.* 1998, 1999, and Verpoorte *et al.* 2002 for an introduction).

notes

1 The 'food-sharing' hypothesis (1978*a* and *b*) was later slightly altered and reformulated into the 'central place foraging' hypothesis' (Isaac 1983*a* and *b*).

2 Binford studied the condition and composition of faunal assemblages (1981, 1987*b*). He compared the animal bones recovered from the African hominid sites with those produced by modern day predators and noticed no big differences between them. Both groups were mainly composed of bones which had little meat value. However, the specimens which showed traces of human modification contained the most marrow.

3 Biological post-depositional processes concern amongst others: carnivore gnawing, consumption and/or disarticulation of carcasses, mole and rabbit digging, earthworm and insect actions and plant and tree root activity.

4 Physical post-depositional processes concern amongst others: geological and fluviatile forces like tectonics, erosion, soil formation, sediment pressure, stream actions, alternate wetting and drying of sediments and frost actions.

5 Changes in chemical composition can destroy or alter some of the archaeological materials.

6 Cultural site-formation processes concern amongst others: trampling activities, removal of manufactured and/or discarded artefacts, use and re-use of lithics and activity loci, and curation and recycling of stone tools.

7 This statement is in fact the basic concept behind 'off-site' archaeology (*e.g.* Foley 1981*a* and *b*; but see also Rossignol and Wandsnider 1992). In Foley's words (1981*b*:2), "an off-site approach is … designed to utilise the spatial continuity to maximise archaeological information."

8 Do the Maastricht-Belvédère 'scatters and patches' represent undisturbed archaeological 'sites', or should they be considered as palimpsests of unrelated events?

9 Previously 'landscape archaeology' had studied the natural environment and its relationships to 'sites' (resource availability, carrying capacity, site-catchment, human adaptation, etc.).