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Leiden

The Netherlands

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Nieuwenhuis, C.J.

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7 Tool types and tool function: adjustments to the settlement history of the Plain of Bogotá and the Magdalena Valley

7.1 Introduction

In the following sections the results of the research project will be linked to the objectives as these were presented in the introduction to this thesis (Ch.1). The methodology with which the objectives were to be accomplished was the analysis of microscopical Wear traces on chert artefacts from a variety of pre-ceramic sites in Colombia. These artefacts are traditionally divided into two classes. The largest group consists of the “Abrian” artefacts which are mostly unretouched or unifacially retouched flakes. Next to this, a class of fine pressure retouched “Tequendamian” implements is distinguished.

The Abrian artefacts are generally classified by characteristics that might appear irrelevant for a functional diagnosis. The traditional typo-morphological classification of these artefacts will be the first element to be re-considered in the light of the results of the wear trace analysis.

The relation between the Abrian and Tequendamian class will then be explored with the help of functional inferences on the tools. The application of wear trace analysis provided a far more accurate insight into the Abrian and Tequendamian system of tool production and use. Thirdly, supposed diachronic changes of climate and environment and, consequently, of tool-use will be critically evaluated.

The data gathered will then be re-assembled in order to discuss the last objective, an attempt to present models for the exploitation of the studied areas, the High Plain of Bogotá and the Magdalena Valley. With the help of functional inferences, adjustments to the existing hypotheses on subsistence and settlement systems in the studied areas will be proposed.

These are not exclusively based on the results of the wear trace analysis, but the results contributed significantly.

As it had never been done on this specific type of raw material, the application of wear trace analysis and the possibilities this offers will be evaluated as well. While analysing the artefacts, it became clear that wear traces on the coarser grained artefacts were difficult to detect, whereas those on finer grained tools were easily recognised. The Abrian class was diagnosed as a typical expedient industry, which accounted for the fact that on a large percentage of the artefacts that were classified as tools, no traces were found at all. Many tools were possibly not used for sufficient time

to allow traces to develop. Absence of traces, however, does not imply that an artefact was not used, and this applies even more strongly to expedient artefacts.

To make inferences on artefacts a micro wear specialist should integrate all possible sources of evidence, including wear traces, residue, edge-morphology and archaeological context, as it is now widely accepted that inferences based on the examination of wear traces alone may be deficient or less accurate. But what to do with an expedient, non-retouched artefact class, where there seems to be no correlation between edge-morphology and traces (a conclusion based on wear trace analysis)? It means that in the case of the Abrian artefacts the edge-morphology (including the edge-angle) cannot be taken as a significant indication of function. There appears to be no unambiguous, macroscopical morphological characteristic that indicates (with an acceptable level of certainty) whether the artefact was used at all. This would mean that the function of each Abrian artefact cannot be known without this analysis and therefore that wear trace analysis is indispensable for a functional interpretation of any “Abrian” site; but it also means that inferences should be based on as much evidence as possible. Other research tools need to be used as well. One of these should be residue analysis. The study of residues added new data: in cases where a functional inference on a specific tool could not be drawn on the basis of wear trace analysis alone, the presence (or absence) of residue helped to reach a final conclusion (Appendix I).

7.2 The typomorphological classification of the Abrian class and the function of the implements

The first objective of this research project was to inquire whether the complex traditional classification of the Abrian artefacts, primarily based on morphology, is relevant for functional inferences. The results of the wear trace analysis have shown that this is not the case. Most of the variables used to construct the classification system are morphological, like “conchoidal”, “subrectangular” or “prismatic”. These appear to be insignificant where the function of the tools is concerned. Besides, traditionally attributed functions, like ‘knife’, ‘scraper’, ‘engraver’, were often not in accordance with the observed wear traces. The non-existence of

a correlation between form and function implies that a number of suppositions need to be revised.

The implicit correlation between concave edges and wood-working, for example, was not confirmed. The hypothesis that wood-working was an important activity at Tequendama (and at other sites) at the beginning of the Holocene appears to be correct, but the increasing importance of this activity, that is to say the dependence of the people on wood as raw material, may not have been as strong as the excavators propose (Correal & Van der Hammen 1977). The traditional conclusion linked to the appearance of concave edges is that many tools were made of wood, but the fact that a variety of materials were worked with the stone artefacts indicates that stone certainly served various domestic tasks. For many purposes wooden tools may even be considered inadequate, as wood can never provide a very sharp cutting edge, unlike bamboo, shell, bone and fine-grained chert. The Abrian class should not be interpreted as a class primarily destined to be tools for manufacturing other tools made from wood, cane or bone, but as a toolkit fit for the execution of most domestic work. This conclusion can not be drawn without use-wear analysis.

For the more special tasks the Abrian toolkit also appeared to be sufficient. It was a common idea that the Abrian class lacked stone projectile points, as these were not recognised typo-morphologically. There were no retouched, pointed flakes that matched the typical arrowhead. It was supposed that these too were made of wood and therefore not preserved (Hurt 1977; Hurt et al. 1977; Richardson 1978). However, there are countless stone flakes with pointed shapes that are well suited for shooting, not only at the studied sites but at practically all sites with Abrian material, in various environmental settings. Among the analysed artefacts from all sites are flakes with traces interpreted as the result of use as projectile tips. At the site Neusa in the Páramo area, where wood is practically absent (Escobar 1992), the Abrian artefacts include a large series of triangular flakes which were probably used as arrowheads.

Although in the lower, forested zones there may have been arrows of wood and cane, the presence of stone points in different environments indicates that these foragers did not have to rely on other material for hunting activities. Clearly, unretouched points of coarse grained chert were considered effective enough for manufacturing arrows. Experimental studies (Odell & Cowan 1986) have shown that unretouched or minimally retouched points have certain advantages over bifacially shaped ones: they are easier to make, readily available wherever the tools are manufactured, they can be made from cores that are not suitable for the production of bifaces (valid for most of the tabular chert from the High Plain of Bogotá) and they can be expected to have use-lives comparable to most bifacially retouched points.

The Abrian class has frequently been characterised as reflecting “degenerating stone working abilities”: as these people are supposed to have focussed more on other material, they are thought to have lost their abilities to work stone. This idea seems to be influenced by European (late) palaeolithic typological tool sequences in which well-defined types prevail. It is based on the supposition that the absence of a technological innovation and/or improvement (like bifacial retouch) represents inability. This does, in my opinion, not respect the ability of people to make technological choices, at all times and in any cultural context. Most scholars are now aware of the fact that societies may choose between a number of available technical options on many grounds, which may not seem obvious at first glance. As Lemonnier puts it, “the expression ‘technological choice’ emphasizes the sorting out of possibilities on which the development of a technical system is *de facto* based, although usually in an unconscious and unintentional way” (Lemonnier 1993:7). For the Abrian tool makers it seems that neither the application of the technological possibilities of some of the raw material (fine grained chert), nor the aesthetic aspects and durability of the toolkit were a priority. In the course of this chapter it will become clear which factors did motivate the choice for an expedient production system.

It should be asked whether a complex classification system is adequate for the description of expedient artefacts manufactured with no obvious predetermination. The shapes of the edges of the Abrian implements are mostly accidental. When the raw material consists of river pebbles and cobbles, as is the case in the Magdalena Valley, many flakes have at least one conchoidal edge. This could well be observed while manufacturing the artefacts for the experiments. These same flakes mostly have a straight edge, which often appears to be the edge actually used: still they would be classified as conchoidal, as there is no distinctive category within the classification system for “flakes with a straight edge”. Some of these would be classified as “lateral scrapers”, but only when the edge angle is rather obtuse or when the edge is retouched. These flakes, however, appear to have been used for a variety of tasks and not exclusively for scraping. When the raw material consists of tabular blocks, as with the Galindo material, many of the resulting artefacts are inevitably more or less rectangular. This did not, however, imply that it limited the usefulness of the tools. As long as they had at least one usable edge, they were used, and for all kinds of activities.

Ethnographic studies have been carried out among modern hunter/gatherer societies that produce toolkits of the same type of raw materials with comparable morphologies. These studies have focussed on how knappers classify their own artefacts, and one of the conclusions is that typomorphological classifications are often functionally irrelevant

(e.g. White 1967; Gould, Koster & Sontz 1971; White & Thomas 1972; Gallagher 1977;). In their urge to categorise and order artefacts, archaeologists often find it difficult to realise that their main guideline for classification, morphology of the total tool (in contrast to edge-morphology), may have been totally ignored by prehistoric people. Furthermore, the principles according to which classification systems are designed are frequently copied from what is used in other areas and may therefore not be well adjusted to the studied material. This seems to be the case with the Abrian artefacts: criteria for classification are taken from systems designed for European and North American assemblages which are characterised by at least some form of predetermination. These criteria do not fit the Abrian class.

For a long time, the classification of Abrian artefacts appear to have become an aim in itself. The choice for a specific classification system, however, should always be linked to a research aim. Although it is justifiable that existing models and ordering systems are borrowed for inspiration, it is no longer defensible that a system which seems to be primarily based on stylistic principles should be used for a functional classification. If the aim is to inquire into the function of artefacts, a simple system based on edge-morphology would be adequate. Macroscopically observable phenomena, like intentional retouch, a straight edge, small edge-removals or protruding points could be used as criteria for classification. This does not imply that artefacts with these phenomena can be classified as certain tools. Characteristics that concern the morphology of the total tool can even be left out for a functional analysis. Implicit functional inferences, like knife or scraper, should be avoided: this inference can only be made after microscopical analysis. In practice this would imply that practically all lithic fragments found in an Abrian assemblage could be classified as possible tools. Still this is exactly what characterises an expedient artefact class: every fragment, regardless its overall shape, can serve as tool, as long as it has a suitable edge. If aimed at a functional characterisation of a site, identifying “tools” is an objective of classification. Based on the results of the Wear trace analysis it is, in my opinion, safe to state that of all the artefacts one would classify as possible tools in an Abrian assemblage, not more than 50%, but probably far less, will display traces of use.

7.3 Abrian versus Tequendamian

The distinction between Tequendamian and Abrian artefact classes has long been the basis for theories on specialised Pleistocene hunters and less specialised Holocene foragers. When these theories were developed, it was thought that the Tequendamian tools were exclusively dated to the late Pleistocene and were gradually replaced by Abrian implements at

the onset of the Holocene, which are then considered an adaptation to the changing environment. The Tequendamian implements were thought to represent specialised hunters of large game, still present during the late Pleistocene but to become extinct in the first millennia of the Holocene. These hunters would have been the carriers of specialised technologies into the southern area of the New World. However, the discovery of new sites in the past 15 years has led to a number of new visions or insights that are strongly in contrast with traditional theories. One of these is that the late Pleistocene hunters/gatherers may not have been as specialised as was thought (e.g. Willey 1971; Lynch 1990 vs. Gnecco 1990, 1997).

In the past decade, Tequendamian-like implements were found in Holocene contexts as well, and the Abrian artefacts are found from the late Pleistocene up to Colonial times. With the new data, the strict division between Tequendamian and Abrian and the related theories on specialisation, technological abilities and subsistence in general, may be considered too simplistic. By means of functional analysis it was hoped to find more clues on the relation between finely retouched artefacts and unifacially, or non-retouched implements in both Abrian and Tequendamian assemblages.

There seems to be a difference between the coexistence of Tequendamian and Abrian artefacts on the Bogotá plain and in the Magdalena Valley. At the site Tequendama, there are two finely retouched implements: a proximal point fragment and an end scraper (see also Cooke 1998). These tools are made of a fine grained, non-local chert (source unknown). The scraper has moderately developed hide working traces, the point fragment has too much patina on its surface to permit reliable interpretations of wear traces, and the microfractures do not give a clear indication of use. For several reasons it seems unlikely that these two artefacts were manufactured by the same people that produced the Abrian artefacts at Tequendama. One would expect more of these finely retouched tools among the total number of artefacts found at the site. The other six Tequendamian artefacts from that site are less finely retouched and made of local chert. It can be argued that these six implements are accidental quality-products within a generally simple Abrian tool-making tradition, an interpretation which could also apply to the very few finely retouched artefacts found at other sites of the plain, like Tibitó (one retouched keeled scraper). Correal and Van der Hammen (1977) do not make very explicit statements in this respect, but propose that the hunters that produced the Abrian tools at Tequendama were the same people as the producers of the eight Tequendamian implements found in the lowest level of the site. These would have been made during seasonal visits in areas outside the Bogotá plain, like the Magdalena Valley.

Another hypothesis is that the two pressure retouched implements at Tequendama are the product of some form of exchange, possibly with groups from the Valley, as is indicated by the raw material from which they are made. Whether they were brought back to the plain by plain-dwellers after an expedition into the lower valley, or by valley-groups that moved up to the plain, remains unclear. They may have been lost by a group during such a visit to the plain, and found by the occupants of the Tequendama rock shelter.

In the Magdalena Valley there seems to be a different situation. In the first place, there are far more retouched artefacts than on the Plain of Bogotá. An explanation may be the availability of suitable raw material. Secondly, Abrian and Tequendamanian artefacts at the sites in the Valley are made of the same raw material, unlike the few samples found on the Plain of Bogotá.

The analysed Tequendamanian tools from the Magdalena Valley appear to have been used with a certain degree of opportunism, like the Abrian artefacts. Although their shapes are well designed, there is no simple correlation between the function and the typo-morphology. A classified scraper was possibly used as butchering tool, and a projectile point seems to have been used for boring and cutting bone and hide as well. The conclusion that finely manufactured implements are an indication of functional specialisation is therefore not supported here (Chap. 6.6).

Although the number of analysed Tequendamanian artefacts from the valley is very small, my impression is that both artefact classes seem to have been used according to the same pragmatic rules: there is no strict correlation between form and function. Therefore, in the valley it is possible that both Abrian and Tequendamanian tools were all made and used by the same groups of foragers. Of course this is in first instance suggested by the fact that both classes are (in some cases) found within one assemblage (La Palestina, Peñones de Bogotá), and by the fact that they are made of the same material. The Abrian artefacts may in part be waste material from the manufacturing of the Tequendamanian tools. In that case these foragers had a very effective way of using waste, especially as we have seen that many of the Abrian flakes were tools themselves.

At the studied sites from the Magdalena Valley a number of refittable flakes was found, but, possibly due to the fact that the excavated areas were very small, these could not be refitted onto the Tequendamanian tools found in the same assemblage. If a larger area were excavated, this would be an essential subject of study in order to test the hypothesis that the artefacts are actually part of the same reduction sequence and that the differentiation between the Tequendamanian and the Abrian implements has no inter-cultural but intra-cultural implications. These can either refer to a functional level, or

to a more social level. It can, for instance, be proposed that the Tequendamanian tools were only used for special occasions, that they were embedded in social or exchange networks (see for instance McBryde 1984). This, in its turn, might be verified if Wear traces on more of these artefacts could be analysed (see also Nieuwenhuis 1998). Studies of samples of retouched points have shown that these were not always used as expected. They may not have been used at all (e.g. Beard 1995), or may have served several purposes (e.g. Odell 1981).

It should be stressed that the presence of bifacial points is not unquestionable evidence of specialised hunting, and that the absence of these points does not necessarily imply that there was no specialised hunting of large game. In both studied areas hunting seems to have taken place with unretouched flakes, as is suggested by the Wear traces on a number of more or less triangular flakes. The association of technologically predetermined points with specialised hunting of large mammals may seem obvious from some points of view, but large mammals may well have been hunted with simple unretouched flakes. Evidence of this type of hunting is found at two Mesolithic sites in Denmark, Prejlerup and Tybrind Vig (Aaris-Sørensen 1984; Fischer et al. 1984).

7.4 Changing environment and subsistence: diachronic changes in tool use?

Inferences on the Abrian class used to be linked to the changing environment at the beginning of the Holocene. It is generally supposed that this class is associated with — and therefore characteristic of — subsistence in forested environments (eg. Gruhn & Bryan 1998). There are many areas surrounding Colombia where material is found that is comparable to the Abrian artefacts. An example are the tropical lowland sites Culebra and Provincial in the Orinoco River Valley in Venezuela. The lithic material found in the preceramic levels of these valley sites (dated to ca. 9000 BP) is similar to the Abrian industry from the high Plain of Bogotá, and also to Talamanca and Boquete phase material (Rio Chiriqui) from Panamá and to material from the Santa Elena peninsula in Ecuador (Early and Late Las Vegas phases; Barse 1990). It concerns simple flake industries, manufactured with direct percussion and mostly unretouched. A number of projectile points which resemble types found at other sites in Venezuela (Canaima complex and Las Casitas Complex) was found at the Orinoco sites as well. The Abrian complex is seen as an early Holocene adaptation to the tropical lowland environment, possibly forming part of a widespread, post-Pleistocene radiation into the tropical lowlands originating from the northern Andean region. The toolkit is interpreted as designed for the manufacture of items from cane, wood and bone, “materials upon which most of the tropical forest culture’s technological repertoire is predicated” (ibid 1990).

This may be true for some sites, but not for tropical sites in general, as we have seen in the middle Magdalena area where similar stone implements were used for any task. The Abrian class of artefacts is also found in sites which were located in non-tropical contexts and non-forested open landscapes (e.g. the páramo area). It does not seem justified therefore to interpret the tools as adaptive: it is not logical to interpret a class of artefacts found in totally different environments as an adaptation to one specific environment. Besides, the fact that this type of artefact is also found in late Pleistocene contexts, in tropical areas as well as on the high Plain of Bogotá, further enervates the idea of “adaptation”, as there was little or no environmental change in that phase. In the case of the Abrian toolkit the concept of “adaptation” should better be avoided. It would have been appropriate if the Abrian artefacts would all date to approximately the same period and if they were found in comparable contexts. The contrary is the case. The concept of pragmatism seems to be more adequate. It explains that this type of forager could operate in any environment, for thousands of years, *exactly because* he kept his toolkit simple. The tool design and technology allowed them to settle anywhere without long-term planning (see also Nieuwenhuis 1998). This will further be discussed below (section 7.5.)

Another question one should ask is whether the environmental changes in the tropics were indeed as drastic as claimed. “Drastic” climatic change could be defined as change with such an impact on the environment that it would force a change of lifestyle within two or three generations. So defined, it can be asked whether the environmental change was indeed so “drastic” as to influence the behaviour of human groups. In general, the late Pleistocene landscape may not have differed so much from that in the beginning of the Holocene (Dillehay et al. 1992). It probably did not force people to change their subsistence strategies dramatically. The fluctuations in temperature and changes in precipitation caused the vegetation belts to rise or fall and caused forests to grow in open landscapes or vice versa. Although the forest composition itself may have changed considerably (see Gnecco 1998), no general type of environment (forest or open landscape) disappeared completely at any moment. The archaeological evidence does not suggest drastic changes either: the same Abrian toolkit is used in an enormous area, for thousands of years, across the Pleistocene/Holocene border. There are chronological or local additions and changes, like the appearance of edge ground cobbles or the absence or presence of choppers, but these are not exclusively dated to the period of transition and therefore not characteristic for adaptations to changing environments. I would therefore support Gnecco’s proposition that in the equatorial area

the Pleistocene/Holocene frontier should only be taken as a point of chronological reference, not as being archaeologically significant (Gnecco 1994, 1998).

In resumé, the traditional scheme in which the Tequendamian class was strictly refined to late Pleistocene specialised hunters in open landscapes, and the Abrian class was seen as exclusively representative of Holocene foragers of the tropical rainforest, should be replaced by another model. Abrian assemblages date from the late Pleistocene to the late Holocene and can be found in any environment. These artefacts represent a simple, multifunctional, versatile toolkit. Tequendamian, or rather Tequendamian-like implements are, in far smaller quantities, also found in both Pleistocene and Holocene contexts in a variety of environments. These tools do not explicitly represent specialised functions but served various domestic tasks and may as well have been used for some sort of status-related exchange.

7.5 Subsistence on the High Plain of Bogotá and in the Magdalena Valley: synchronic variations in subsistence strategies?

In the 1980’s, when the present research project was designed, it was thought possible to reconstruct site functions and inter-site relations by means of, among other things, use-wear analysis. With a good number of well documented, dated sites it should be possible to design models for settlement systems and subsistence strategies in various environmental settings. However, the requirements for this type of reconstruction were seldom met, not in general and even less so in the study area. The number of sites to be analysed in the study area was very limited, and most of these were not more than small test pits. But far more important is the fact that it is now realised that the exact synchronicity of sites can never be demonstrated, which makes it extremely hard to reconstruct settlement systems. Still, attempts can be made to fit the obtained data in an hypothesis on general life-style trends in the tropical setting. To approach this, the diagnosis of the Abrian class as “expedient” may be helpful. Among other things, the simple system of tool production and manipulation facilitated displacement of people to other regions. Binford (1972) defines “expedient” tools as implements which are made and used for some immediate task and then abandoned. This definition does not totally cover the characteristics of the Abrian tools. These versatile tools were mostly, but not necessarily, made for an immediate task. Among the flakes which resulted from a manufacturing session, some may have been selected and kept for future use, some were even unifacially retouched. Most tools were used only once (that is to process one material), but very effective implements may have been re-used. To characterise the expediency of the Abrian toolkits the definitions of Nelson (1989) seem most appropriate.

Traditional scheme				
Tool class	Period	Environment	Function	Associated culture
Tequendamian	Late Pleistocene	Open landscapes	Special tasks: mainly hunting and hide processing	Specialised hunters
Abrian	Holocene	(Sub)tropical forests	Various tasks and especially the manufacturing of tools of other raw material than stone. Not suited for hunting	Broad spectrum foragers
New scheme				
“Tequendamian”	Late Pleistocene and Holocene	Open landscapes and (sub)tropical forests	A variety of purposes, including exchange for maintenance of social networks	Hunters and broad spectrum foragers
Abrian	Late Pleistocene and Holocene	Open landscapes and (sub)tropical forests	Versatile toolkit for all domestic tasks, including hunting	Hunters and broad spectrum foragers

According to her, “expediency refers to a minimal technological effort under conditions where time and place of use are highly predictable (-) and that expediency anticipates the presence of sufficient materials and time” (ibid: 65). On the other hand she distinguishes “opportunistic technological behaviour”, which she defines as “responsive to immediate, unanticipated conditions” (ibid: 65). This is a behaviour which, because of its incidental character, is hard to identify archaeologically.

The approach proposed by Torrence (1989) should be introduced here as well. She registers worldwide transitions from the production of standardized tool types to assemblages characterized by a “wide range of amorphous and unstandardized types, generally produced with minimal effort using local raw materials of no specific quality and used expediently” which is strongly in contrast with the idea that “progress is inevitable” or that “behaviour has evolved in order to minimize the expenditure of time, energy, or raw material” (Torrence 1989:58). She approaches the study of this phenomenon with a concept of “risk-avoidance”. Risk is defined as the probability of failing to meet dietary requirements (ibid: 59), and “technology”, as one of several strategies devised for increasing access to resources when and where they are required and thus reducing the risk involved (ibid: 58). Risk may be reduced by means of a specific technology (e.g formalized complex tools), but also by active management of the environment, as could be observed among Aborigines in Australia (ibid: 65). In my opinion, the Abrian system of non-specialized tool-use and production could best be characterised as a mixture

of “technological opportunism” and “functional expediency”. By technological opportunism I refer to the fact that the manufacturing system seems to have been ruled by a lack of anticipation: the flaking of the raw material was done without having very clear predetermined shapes in mind, and when coarse tabular chert was used the flaking was unpredictable. For each new set of flakes a new selection for different tasks was made on the spot: any flake with usable edges was a potential tool. Functional expediency is used to describe the short life-span of an average Abrian tool, which was not used for a prolonged time.

At all the studied sites, raw material seems to have been available in such quantities that it made expediency possible. At Galindo it even seems that expediency was the only option, considering the bad quality of the chert. This material did not offer much possibilities to manufacture elaborate retouched tools. Besides, the coarseness of this local chert makes it rather useless to dedicate much time on the fabrication of techno-morphologically complex tools. While conducting the experiments for this research project, it could be observed that the edges tend to wear very quickly. Still, this did not inspire the occupants to search for better stone, at least not while they occupied the Galindo terrace. On the contrary, the presence of this chert appears to have motivated the choice of the location for settlement. Except for a small number of “exotic” tools used for plantworking, all tasks were performed with flakes made of the coarse local chert. To further evaluate the consequences of expediency for the reconstruction of subsistence strategies, I will depart from the proposition that, for the Abrian foragers at Galindo and

the other studied sites, “time and place of use” of the artefacts was highly predictable, as both raw material and subsistence products were amply available in all areas under study, at any time of the year.

The concept of “seasonality” is one of the pillars on which the traditional theory on the exploitation of the High Plain of Bogotá and the Magdalena Valley is constructed. The occupants of the rock shelters and open sites on the Plain supposedly lived there for shorter or longer periods during which they made seasonal trips to the Valley in search of tropical products. Archaeological evidence in support of these assumed trips is scarce. There is some evidence of trips from the Plain into the Valley (e.g. tropical products at Tequendama), but I have not found records of archaeological evidence from the Plain at sites in the Valley.

It is surprising that the concept of seasonality is so frequently used for an area of the world where seasons are practically non-existent. Like the inferences on tool classes and the design of a typo-morphological classification system for the Abrian artefacts, the use of seasonality as a crucial influential element on people’s subsistence behaviour may be related to the history of the development of archaeological research in the area, which originally leaned heavily on European concepts. In the studied area there are differences in precipitation which may influence the presence of specific flora and fauna, but the effects of this type of seasonality is in no way comparable to the effects of seasons on subsistence strategies in non-equatorial areas. In the (sub-)tropical areas there is a permanent availability of flora and fauna for all purposes, which implies that there is no need to travel far or frequently to acquire the basic products for subsistence. There is no need to pursue seasonally migrating prey, no need for long term storage of staple goods, no need for long term planning. These are all arguments for expediency. If analysed in terms of “risk-avoidance”, all evidence suggests that it was fairly easy to meet the dietary requirements without complex planning. This refers to dependable availability of both “fast” food resources (readily available) and raw material for fast tool production. Although the foragers were depending on “mobile” food (Torrence 1989) and would therefore run a higher risk of not finding it, this food was available the whole year through. This would reduce the necessity of investing in complex technology in order to reduce the risk of missing a source of food (prey) which cannot easily be replaced by another one. Although the lack of evidence of exchange of goods from one area to the other may be due to the fact that most of these products were perishable, it is more plausible that these trips were less frequent than supposed. At this point it seems essential to elaborate further upon the *wish* versus *necessity* of mobility. This is directly related to people’s ability to cope with, exploit and/or manipulate their direct environment. It seems that the Abrian foragers were flexible

and mobile but not subject to external forces that pushed them to move. If people were not forced to move by population pressure or natural disasters, of which no evidence was found, other factors must have ruled the mobility of the occupants of the studied sites. Products needed or strongly wanted from other areas may have been one of these factors. In both areas studied, the environment seems to have been relatively stable and uniform, providing people with most products needed for subsistence. Trips into other areas were therefore not inspired by basic subsistence needs and may have taken place more spontaneously, in any period of the year. These trips served the purpose of requiring specific, “luxury” goods that were not available locally and not essential for the daily domestic needs but were required for special occasions.

The trips may also have been motivated by social reasons, like maintaining social networks. It is hard to find archaeological evidence for this type of exchange, but ethnographic studies of specific material production and distribution among the Aborigines in Australia have shown that exchange may be conducted for social reasons which overrule material availability or scarcity: “The movement of goods is not necessarily towards those areas in which a particular object or its raw material is scarce, nor is it necessarily determined by that scarcity” (McBryde 1984:268). The presence or absence of Tequendaman-like artefacts in certain areas, for instance, may be explained by such an exchange system.

In spite of the lack of evidence from sites that can be dated to exactly the same period (the sites of similar age in the Magdalena Valley are too small), it is tempting to propose a system of mobility following Binford’s idea that foragers in (sub-)tropical areas display a low mobility due to the homogenous distribution of subsistence goods (Binford 1980). The Abrian foragers would, more or less, fit into his model of “residential mobility”: if they moved, they would do so with the whole group. There is not enough evidence to further specify the type of residential mobility (e.g. Murdock 1967 in Binford 1980), but it can certainly be supposed that special task forces undertook expeditions to acquire specific non-local goods.

However, there seems to be a contradiction in this discussion: the Abrian foragers were highly mobile (that is, they lived according to a system that allowed them to move easily), but displayed a low mobility (that is, they did not *need* to move frequently and are therefore not supposed to have done so). For the Abrian foragers all options were open. They could either stay on the temperate Plain of Bogotá or pick a “season” at wish by moving down into the tropics or up onto the Páramo.

As said in section 7.3, the discovery of new sites led to new insights. The idea of Pleistocene specialisation is no longer

the rule, and linked to this there is growing evidence of early occupation of tropical rainforests by non-agriculturalists. Till recently, this was thought impossible (Cooke & Ranere 1992; Gnecco 1997; Gnecco & Mora 1997 contra Bailey et al 1989; Roosevelt 1998).⁵¹ New data prove that there were foragers living in the tropical rain forest way before the first unequivocal signs of agriculture (Pedra Pintada in Brazil; Roosevelt et al. 1996; Roosevelt 1998), and that human manipulation of the environment took place as early as 10,000 BP (Peña Roja and San Isidro in Colombia; Gnecco & Mora 1997:689). Evidence of man-induced changes in vegetation as early as 11,000 BP is available from the Pacific zone of Central Panama, where Palaeoindian populations appear to have burned patches of moist tropical forest, possibly to attract game (Ranere & Hansell 1995). An increase in forest burning slightly later (9000 BP) and microbotanical remains of starchy tubers may be an indication of a form of plant cultivation. All these data contribute to the hypothesis that the earliest occupants of the continent were no passive victims of the whims of nature but far more flexible than initially thought. The observations made on the basis of the results of the Wear trace analysis of this project strongly support this idea. Turning back to Torrence's "risk-avoidance", the ability to manipulate the environment can be seen as an essential tool to reduce the risk of failing in food procurement and also as an alternative to the production of complex tools (1989).

If the Intermediate Area is seen as funnel through which the earliest inhabitants entered, an implication is that they could

not have relied much on megafauna when they crossed the isthmus of Panama, which was then heavily forested (Drennan 1996:96). It is proposed that the palaeoindian studies have been too much focussed on big game hunting: theories were based on data from early sites on the North American Plains and extrapolated to the totally different environments from Middle and South America (ibid; Roosevelt 1998). In Colombia, although the mastodont population was probably large, there is only one "classic Palaeoindian" site (definition of Lynch 1998) with megafauna remains (mastodont and Equus) in certain association with (possible Tequendamian but mostly Abrian!) artefacts (Tibitó, Correal 1981). Even when it became clear that the evidence did no longer fit the model, the distinction of two separate artefact classes according to a rather fixed chronological scheme persisted for decades. By now I dare to state that the Abrian "class" does exist (although it can be discussed whether it should be considered a class or an industry), and that the Tequendamian class does *not* exist. Implements formerly labelled as Tequendamian either belong to the Abrian class or should be considered as a variety of classes or industries and not as a single one. Subsistence flexibility as proposed by Ardila (1991) is strongly supported by my results: as the traditionally proposed artefact-industries do not appear to exist (if function is taken as point of departure for classification) the manufacturers seem to have achieved a maximum of flexibility: this form of opportunism or pragmatism can be considered the acme of "adaptation".