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The Nubian complex and the dispersal of modern humans in North Africa

The role of Northeast Africa in discussions on the archaeological implications of the 'Out of Africa' model for the origins and dispersal of modern humans has up to now been very modest. Although its Middle Palaeolithic is relatively well-known as compared to other African regions, it does suffer from a lack of standardization in its descriptions. Since the work of the Combined Prehistoric Expedition in Upper Egypt and Sudan in the sixties (Wendorf 1968), numerous Middle Palaeolithic sites have been sampled, excavated and classified into a number of industries or groups. This appears to have led to an unwarranted fragmentation of the Middle Palaeolithic record which may seem rather confusing. Inadequate chronological control has not done much to improve this situation. During the last years things have changed. Fieldwork in both deserts adjacent to the Nile, the Eastern Sahara and the Red Sea Mountains (Wendorf et al. 1987, 1993; Vermeersch et al. 1994), has allowed to establish a relative and absolute chronological framework. Efforts have also been spent at a comprehensive synthesis of the Middle Palaeolithic in this part of the world (Wendorf and Schild 1992). New research paradigms finally have led to the accumulation of data on previously unknown aspects of behaviour, e.g. the nature of settlement systems. In this article, we argue that it is no longer possible to disregard the Northeast African Middle Palaeolithic record when a possible African origin of modern humans is discussed. On the contrary, the record evidences the presence of new and complex cultural features from the late Middle Pleistocene onwards.

1. The Nubian Complex

Using classic technological and typological criteria, it is clear that a number of previously separate Middle Palaeolithic entities can be integrated in one techno-complex which we propose to call the Nubian Complex. The entities be

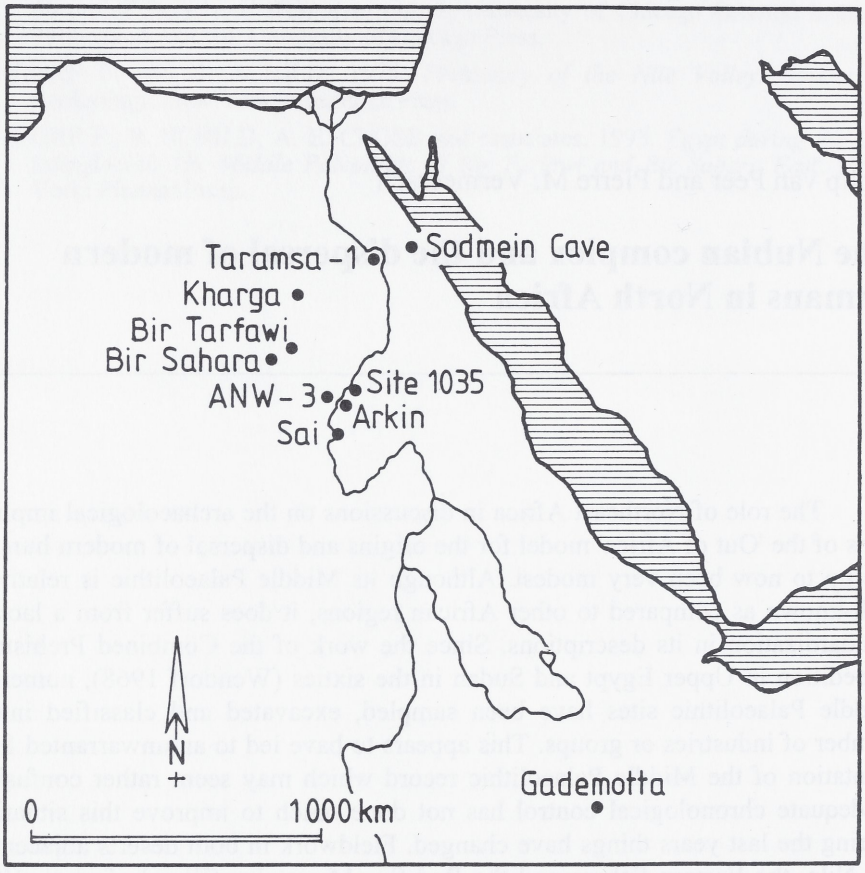

Fig. 1. Map showing location of sites mentioned in the text

longing to it are the Nubian Middle Stone Age or the Nubian Middle Palaeolithic (Guichard and Guichard 1965, 1968), the Nubian Mousterian (Marks 1968a), the N-group (Van Peer 1991a), the Khormusan (Marks 1968b), the 'Denticulate Aterian' as represented in the Eastern Sahara Oases of Bir Tarfawi and Bir Sahara (Wendorf et al. 1987), and the classic Aterian (Ferring 1975). From a technological point of view, all of these groups are characterised by the adoption of the Levallois strategy for blank production. Both flakes and points are produced; the former by the normal centripetal method and the latter by either the Nubian I and II methods (Guichard and Guichard 1965) or the classical point production method (Bordes 1961). In many assemblages, however, the latter method is rarely used as compared to the Nubian methods. In some Nile Valley assemblages, the

Nubian methods are the only ones to occur. Typologically, Nubian Complex assemblages share a number of similarities as well. Common tool types are bifacial foliates, various retouched point types (Fig. 2) including Mousterian and Nazlet Khater points (Vermeersch et al. 1990b), and truncated-facetted pieces (Solecki and Solecki 1970). In addition, they all show the presence of significant proportions of side scrapers, denticulates and a good deal of Upper Palaeolithic types. Absolute numbers of tools and the relative importance of types evidently may vary according to several factors, site function in the first place. Many of the Nile Valley assemblages come from quarry and initial processing sites at which retouched tools are rare altogether.

This Nubian Complex can be contrasted with a Lower Nile Valley Complex in which industries lacking most of the characteristics described above can be grouped together. Point Levallois methods never occur. Bifacial foliates, Nazlet Khater points and truncated-facetted pieces are not attested in any of these assemblages. The Lower Nile Valley Complex consists of the non-Nubian Middle Palaeolithic (Guichard and Guichard 1965, 1968), the Denticulate Mousterian (Marks 1968a) and the K-group (Van Peer 1991a). On the other hand, this complex has its own characteristic technological and typological features, the use of a particular Levallois method of dorsal preparation - the Safaha method - and the presence of lateralized Levallois flakes (Van Peer 1991b).

2. Aspects of complex behaviour

A number of complex behavioural traits can be inferred from the nature of Nubian Complex sites and the characteristics of their associated lithic assemblages.

2.1. The Nubian Complex settlement system

In the Nile Valley, most of the Nubian Complex sites are located on Nile or wadi terraces and inselbergs and must be considered as quarries and workshops. Other site types are rare since old floodplain sediments have been rarely preserved or are not exposed at present. The quarry site of Taramsa-1 on the western Nile bank, opposite the city of Qena (Fig. 1), has been used throughout the Middle Palaeolithic by both Complexes (Vermeersch et al. 1997). Together with Arkin-5 in Nubia, it holds the best evidence of Nubian Complex chert extraction strategies.

2.1.1. Quarry sites

The organisation of chert extraction

Middle Palaeolithic chert extraction strategies are discussed by Vermeersch et al. (1990a). Taramsa-1 is located on a remnant hill the core of which consists of coarse gravels of local origin. The gravel consists for about 90 percent

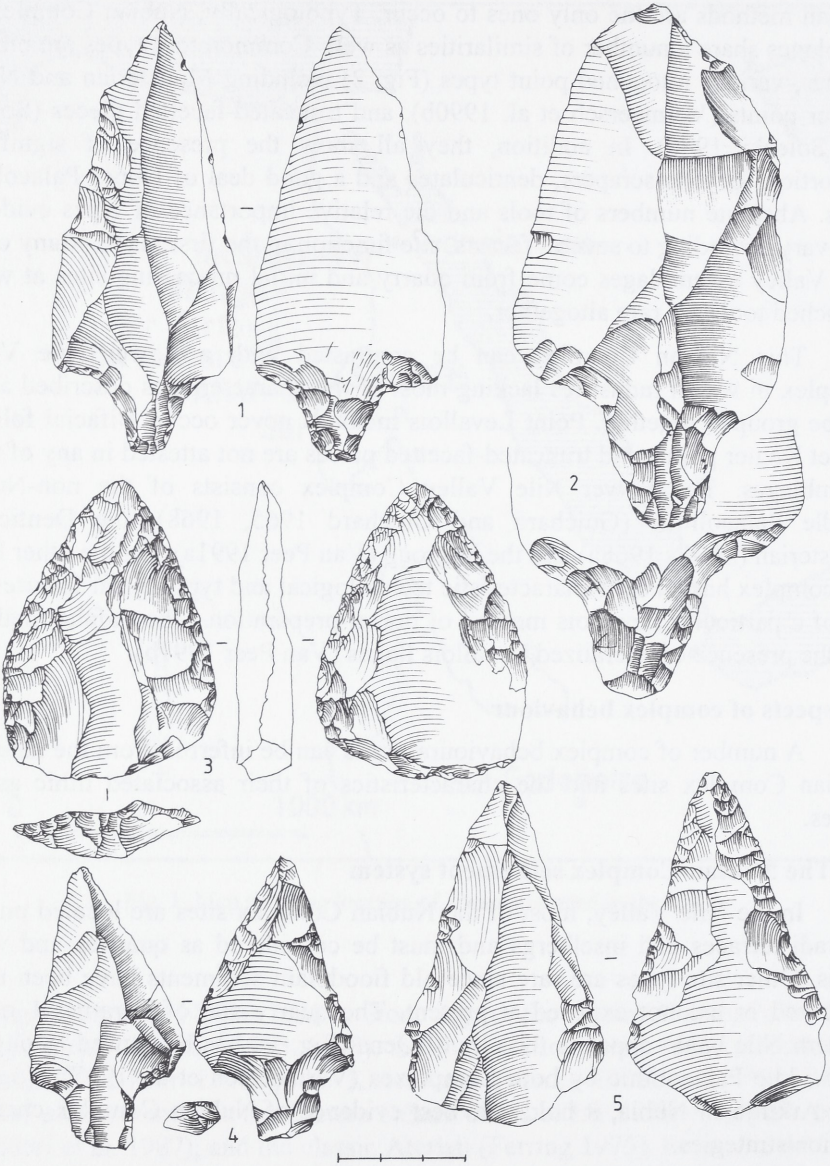

Fig. 2. Points from Nubian Complex assemblages.

1: Tanged Nubian point from Kharga Oasis, Bulaq Pass A (after Caton-Thompson 1952: pl. 88,8);
2: Tanged Nubian point from Foum el Alba 12 (after Tillet 1993: figure 208, 297);
3: Bifacially retouched point from Bir Sahara-13 (after Wendorf and Schild 1980: fig. 2.36, e);
4: Tanged Nazlet Khater point from Tabelbala (after Belaouane 1982: planche 6,1);
5: Nazlet Khater point from Kharga Oasis-Bulaq Pass A (after Caton-Thompson 1952: pl. 87,2).

of chert pebbles which are morphologically suited for flaking. Pits with an asymmetric section were dug into the gravel deposit. The *in situ* gravels were exploited in an almost vertical profile at the base of the pit. Waste matrix was dumped at the opposite side of the pit, creating a gentle access slope to the extraction front. As the exploitation activities proceeded, the original pit was extended or sometimes transformed in an irregular trench. Often, older exploitation features are cut by more recent ones. In such areas, the final depths reached by the most recent activities may be up to 2 m below the present surface, as the dump deposits of the former extraction had to be dug across. At the base of several extraction profiles, isolated bifacial tools - bifaces or foliates - are found which probably served to remove pebbles from their matrix. Other extraction tools - perhaps organic - are not known up to now.

The organisation of debitage activities

Extracted chert pebbles were reduced at the edge of or within the exploitation features, mainly according to the Levallois reduction strategy. In these flaking activities, a degree of spatial organisation can be observed. In several site sectors, concentrations of pebbles were present which apparently served as stocks of raw material waiting to be processed. The actual flaking of these pebbles took place at some distance of these stocks. Intercalated within extraction dump deposits or aeolian sands blown into the pits, dense concentrations of lithic artefacts can be found. Extensive refitting of reduction sequences is generally possible. Completely reconstructed sequences always show the scar of a first large cortical flake. That flake itself, however, is usually absent from the artefact scatter. Extracted nodules were first tested for quality and then transported to the spot where further treatment was to take place. The same reconstructed reduction sequences frequently show that specific products are missing. Mostly, these are Levallois blanks. On the other hand, concentrations of Levallois blanks are found in several areas of the site. These can be considered as products, selected from the waste concentrations for further transportation and use.

Transport of products

Next to blanks, Levallois cores may be lacking from reconstructed sequences. These are always cores for flakes. In point reductions, this feature is never observed. Levallois point reduction sequences appear to be part of a very different dynamic system as compared to Levallois flake reductions. The same divergence appears from a quantitative analysis of both Levallois blank and core samples from quarry sites. At such sites, Nubian Levallois cores are always much more numerous than Nubian points (Van Peer 1991 a). Such cores are clearly waste products, designed to produce blanks for specific and well-anticipated functions. Flake samples, on the contrary, are much more ambiguous. Usually, however, relatively few flake cores are still present as compared to the quantity

of Levallois flakes. This indicates that not only the latter, but (primarily) the former were taken away from these sites.

2.1.2. Other sites

Living sites

Quarry sites are located outside the margins of the Nile floodplain and can therefore be easily found. For other site-types, we should take into account a possible location within or at the edge of the then floodplain. Since such old sediments have only been rarely preserved from erosion, extremely few Middle Palaeolithic living sites are known. In Nubia, however, a few sites have been recorded in the area of the confluence of the Khor Musa with the Nile, which have been grouped in the Khormusan industry (Marks 1968b). These are associated with fluviatile sands and silts, do show a Middle Palaeolithic technology and are beyond the radiocarbon range (Wendorf and Schild 1992: 46). As a consequence, their chronological position cannot be ascertained, nor can their relative position to the Nubian Mousterian quarry sites in that region. As stated before, the Khormusan can be ascribed to the Nubian Complex on technological grounds, in particular the presence of Nubian Levallois products. Furthermore, Levallois flake samples from Khormusan sites show quantitative characteristics which are very close to those of Nubian Mousterian samples (Van Peer 1991a). Even if the contemporaneousness of the Khormusan sites with the Nubian Mousterian quarries cannot be established, they may be considered as representing a particular site type within the general Nubian Complex settlement system. The presence of high proportions of retouched tools, fireplaces and both mammal and fishbones suggest that they are living sites where a range of activities was performed. The Levallois flakes and cores of which the absence is noticed at the quarries were probably transported to sites of this type.

The particular structure of the lithic assemblage from Khormusan site ANW-3 (Van Peer 1991a: tables 1 and 2) indicates the introduction of both Levallois cores and finished Levallois flakes into the site. The general debitage to core ratio (all debitage divided by the total number of cores) is extremely low (6.7) whereas the relative number of Levallois cores in the total cores sample is high. This suggests that prepared cores were brought onto the site. The sample of Levallois flakes produced from such cores was supplemented with a number of introduced flakes. On the basis of the limited number of Levallois flake cores, one would expect less Levallois flakes in the assemblage than are actually present. Also, the mean length of the flake sample is higher than the mean core length (Van Peer 1991a: table 2) which is contrary to the evidence of workshop sites. In between the quarry/workshop and the living sites, we may have to take into account the existence of a 'mixed' site type which takes both spatially and

functionally an intermediate position between the former. Site 1035 (Marks 1968a) is an example. It is located at some distance from its raw material source, but yet outside the floodplain. It was originally classified as Nubian Mousterian by Marks, but appears to exhibit numerous Khormusan characteristics. In this respect as well, it provides a link between the Nubian Mousterian workshops and the Khormusan living sites. Levallois cores appear to have been introduced here in already prepared state, but proportionally few Levallois flakes are present as shown by the very low Levallois flake/core index (Van Peer 1991a: table 1). The latter may have been taken on to floodplain sites.

Special activity places

At none of the Khormusan sites, significant numbers of Nubian Levallois blanks nor retouched Levallois points (of various types) are encountered. The quantities produced at the workshops, therefore, must have been taken to other locations and we must infer the existence of another site type in the Nubian Complex settlement system. Given the probable use of such types as projectiles (Shea 1995), such locations are likely to be short-term hunting camps. They may have been situated close to the river bank or near water-filled depressions within the floodplain. In any case, the chances of finding them at the present time are close to zero. If, however, we turn to the archaeological record of the Eastern Sahara and the Red Sea Mountains where the Nubian Complex is present from the Last Interglacial on (cfr. below), precisely these sites are attested there.

At Wadi Sodmein Cave in the Red Sea Mountains, two Nubian Complex levels consist of low density scatters of lithic objects (Van Peer et al. 1996). In direct spatial association with two ephemeral fire places, a few tools and Nubian points have been found. They have apparently been brought into the cave in their finished states. The formation of these occupation levels has been interpreted as the result of repeated short term visits (Van Peer et al. 1996). Given the strategic location of Sodmein Cave, overlooking a narrow pass through which the wadi Sodmein runs, these short visits may be related to hunting expeditions. In the Bir Tarfawi basin of the Eastern Sahara, Wendorf and Schild (1992: 66-68) describe specific activity areas, related to meat procurement located in lake bottoms. Mousterian points - some of which are Nazlet Khater points - and side scrapers are associated here with bones of large and medium-sized mammals. Moreover, they also report the existence of quarries from which cores seem to have been taken away.

2.1.3. Conclusion

Though the present archaeological record is rather heavily biased towards quarry and workshop sites, it allows to infer a rather complex settlement pattern for the Nubian Complex. It suggests that hunting was an important subsistence

strategy among such groups. Lithic tools associated with hunting activities were the result of a specific production system which evidences elaborate planning.

2.2. Lithic tools

The usual array of Middle Palaeolithic types is represented in Nubian Complex assemblages. The various point types as discussed above, demonstrate that relatively simple forms may result from both complex reduction strategies and production systems. Points were apparently meant for a limited set of functions which were already anticipated at the start of the production process and to which that production system was specifically adapted. From that point of view, they can rightly be called complex tools. Being functionally similar to Upper Palaeolithic and later projectiles, it has been suggested that African Middle Stone Age points do show similar, modern, regional patterning as well (Brooks 1996). In the region under concern here, it is clear that points and the production system behind them, are only present in the Nubian Complex. They are never encountered in Lower Nile Valley Complex assemblages. This material culture patterning indicates more than a superficial functional divergence: it shows that both archaeological complexes represent very different adaptations in terms of subsistence strategies.

In discussing the function of points, the issue of hafting needs consideration as well. Tool hafting is an indication of technological complexity and of a curated mode of tool use in which efforts are spent to maximize the life cycles of tools. Use-wear studies (Anderson-Gerfaud 1990; Shea 1995) have presented evidence of tool hafting in the Middle Palaeolithic. Though it is not confirmed by microwear analyses, several tool types in the Nubian Complex seem to have been morphologically adapted to hafting. This is the case for truncated-facetted pieces and, evidently, the tanged forms of the Aterian. In this context, it may be of interest to report on a tool found in a Nubian Complex level at Wadi Sodmein Cave in the Red Sea Mountains. In Middle Palaeolithic level 4, a large Levallois flake was present of which the medial part is covered with a continuos band of red ochre (Fig. 3). On the dorsal face, the ochre band is partly covered by a calcite crust. The right upper edge of the flake is denticulated. At the distal end a bifacial fracture is visible. The dorsal fracture has a step-like ending, indicating that the fracture resulted from a heavy blow. The large fracture to the left of the former may also have been caused during the same event. Use-wear analysis of the proximal flake part shows a well-developed wood polish, in which striations parallel to the axis of the tool are present. The polish continues up to the lower edge of the ochre band. Possibly the tool was attached here to its haft with an organic substance covered with ochre. This example from Sodmein Cave is another demonstration of the fact that complex tools were used in the Middle Palaeolithic.

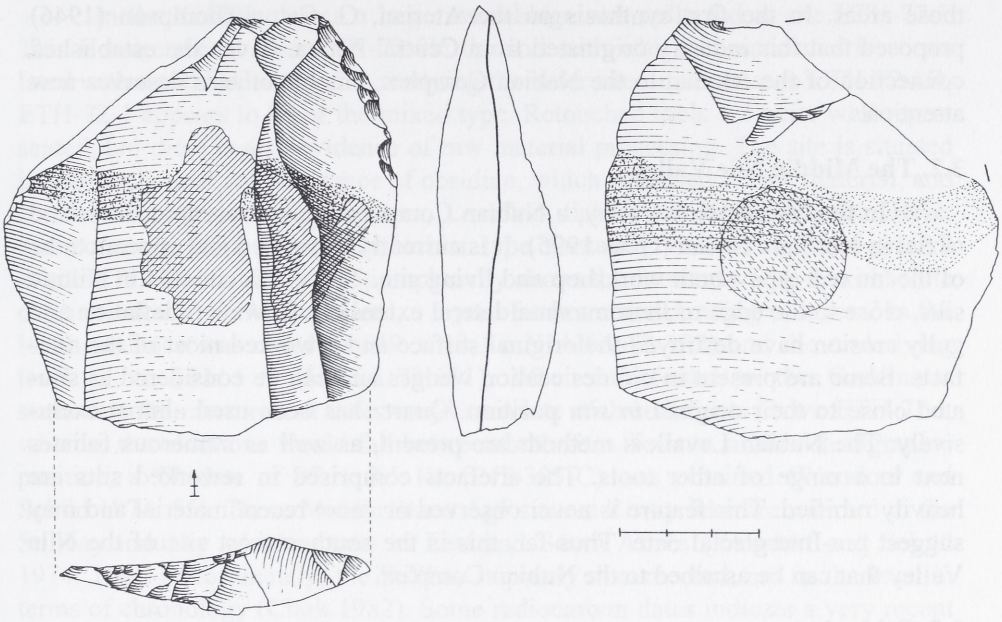

Fig. 3. Levallois flake from Middle Palaeolithic level 4 at Wadi Sodmein Cave. Dotted area represents the central red ochre band. Hatched area on dorsal face: a calcite crust. Hatched area on ventral face: a circular inclusion of different colour in the chert.

3. The origin of the Nubian complex

Having established some complex cultural features of the Nubian Complex, its origin should be discussed. I will review the chronological and geographic evidence, starting from the north and proceeding in southern direction.

3. 1. The Lower Nile Valley

The earliest Nubian Complex occurrence in the Lower Nile Valley is documented at the Taramsa-1 site. Here, the 'foothill concentration' appears to date to the late Middle Pleistocene (Vermeersch et al., in preparation). In Acheulean industries of the Nile Valley, none of which is well dated, Nubian Levallois methods nor Nubian tools are ever present. Apparently, the Nubian Complex is new to this region from the late Middle Pleistocene on. During the Last Interglacial, Nubian Complex groups have dispersed into the deserts east and west of the Nile, which at that time were favourable environments for human occupations. With the onset of arid conditions, Aterian groups remained present in

those areas. In the first synthesis on the Aterian, G. Caton-Thompson (1946) proposed that this industry originated from Central Africa. Given the established connection of the Aterian to the Nubian Complex, this hypothesis deserves new attention.

3.2. The Middle Nile Valley

In the Middle Nile Valley, a Nubian Complex site is present at the island of Sai in Northern Sudan (Geus 1995). It is currently excavated and appears to be of the 'mixed' type - both workshop and living site. The site is situated in Nilotic silts, close to the edge of their maximal lateral extension. However, deflation and gully erosion have destroyed the original surface and reworked most of the artefacts. Some are present in old desiccation wedges and can be considered as situated close to their original *in situ* position. Quartz has been used almost exclusively. The Nubian Levallois methods are present, as well as numerous foliates next to a range of other tools. The artefacts comprised in reworked silts are heavily rubified. This feature is never observed on more recent material and may suggest pre-Interglacial date. Thus far, this is the southernmost site of the Nile Valley that can be ascribed to the Nubian Complex.

3.3. Ethiopia

In the region of Lake Ziway in Ethiopia, a number of Middle Stone Age sites in a local stratigraphic framework have been reported by Wendorf and Schild (1974). The oldest one in the Gademotta area is ETH-72-8B. It is located in a possibly man-made depression within a thick brown soil, at the base of which (a poorly documented) Acheulean occurs. The lithic assemblage is characterized by low frequencies of cores and debitage products, whereas the proportion of tools and re-sharpening spalls is relatively high. The site is interpreted by the authors (1974:152) as a long-occupied base camp. In that sense, it would correspond to the living site-type in the Nubian settlement system. In terms of tool types, various types of Mousterian and bifacial points occur, often elaborated on Levallois blanks; some of them have mainly ventral retouch and are reminiscent of Nazlet Khater points (e.g. 1974, plate XII, 13 - interpreted as a burin by the authors). Many points show re-sharpening scars suggesting their use as knives though a possible projectile function is not excluded (Wendorf and Schild 1974: 79-80). In addition truncated-facetted pieces are well attested (e.g. 1974, plate IV, 4-5). Since unretouched Levallois points and Levallois cores are rare, it is difficult to judge on the presence of the Nubian Levallois methods. Some tool drawings, however, strongly suggest that this is the case indeed (e.g. 1974 plate IX, 4). Given the high quantity of various point types, this site might be alternatively considered as a special activity spot of the nature described above.

In the Kulkuletti area a large assemblage was collected at site ETH-72-1. This is more recent than ETH-72-8b: the soil with which is associated is correlated with a soil at Gademotta, overlying the latter site. In contrast to ETH-72-8B, ETH-72-1 appears to be of the mixed type. Retouched tools are quite well represented, but there is also evidence of raw material processing. The site is situated immediately near an occurrence of obsidian, which was used as raw material, and contains numerous Levallois cores, Levallois flakes and debitage waste. Here, some cores do seem to be of the Nubian type. Certainly, Nubian cores are present at site ETH-72-6 which is stratigraphically above the former two. A few absolute dates are available. At Kulkuletti, a layer of ashes corresponding to layer 7 in the local sequence was dated to 149 + 13 Ka (UAKA-73-132) and the underlying level 11 to 181 + 6 (UAKA-73-131). When transferred to the Gademotta sequence, the more recent date would correlate with sediments above ETH-72-1, whereas the older one would fall between both sites. From a similar stratigraphic position, a TL-date of 97 + 8.5 Ka (P-T-303-C) was obtained (Wendorf and Schild 1974: 55). These Middle Stone Age sites at Ziway lake are referred to the Stillbay industry which occurs in East and South Africa (Wendorf and Schild 1974: 154). Unfortunately, the Stillbay is poorly documented, not in the least in terms of chronology (Clark 1982). Some radiocarbon dates indicate a very recent age. The Ziway dates, however, may indicate that these radiocarbon dates should be used with the greatest caution.

4. Conclusion

In the later Middle Pleistocene, a new technological system appears in the Lower Nile Valley which is profoundly different from the local Acheulean and the Middle Palaeolithic industries issued from the latter. A well-organized settlement system can be inferred from the patterning in that material culture, involving complex raw material procurement strategies, planned production and transportation of particular categories of lithics, and the use of specific locations in the landscape for certain subsistence-hunting activities. This archaeological evidence of change may correspond with the *Out of Africa* model for the dispersal of anatomically modern humans into northern zones of the world. However, it must be taken into account that cultural complexity is characteristic of other Middle Palaeolithic entities as well. Therefore this alone may not be sufficient to identify anatomically modern humans (Van Peer 1998). In order to investigate the possible origin of the Nubian Complex in sub-Saharan Africa, the Stillbay industry should be carefully looked at. It does seem indeed that most techno-typological features of the Nubian Complex are present in southern assemblages which can be referred to the Stillbay. At present, however, there is little evidence to ascertain the chronological position of the latter industry and, consequently, the diachronic relationship with the Nubian Complex. During the initial stage of the

Last Interglacial, groups which had been present in northern reaches of the Nile Valley for a long time, dispersed into the favourable environments of the areas adjacent to the Lower Nile Valley. In the latter, the Nubian Complex disappeared after 60 ka. It remained present in the Eastern Sahara and perhaps the Red Sea Mountains. A technological innovation - the use of various forms of tanged tools in the Aterian - seems to be a response to degrading climatological conditions from isotope stage 4 onwards.

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