CHAPTER 11

FLAKED STONE FROM THE WORKMEN'S VILLAGE

by

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11.1 Background

In the Amarna correspondence gifts of flaked stone tools for barbers are included in the diplomatic gifts sent from Egypt to Babylonia (*CAD* M II: 37 s.v. *mešeltu*). The identification of the exact tools referred to in this correspondence could perhaps best be considered in the context of a comprehensive study of other possible textual references to New Kingdom flint and flaked stone tools (e.g. Harris 1961: 138-139; Midant-Reynes 1981) as well as a study of the typology of flaked stone artifacts in Egypt and Western Asia during the latter part of the second millennium B.C. Although the recognition, recovery and recording of flaked stone artifacts whose distribution is sometimes assumed to be limited to prehistory can be inadequate on sites of this period, a variety of flake, blade and bifacially flaked flint tools have been excavated from New Kingdom sites including Amarna (Spurrell 1894; *COA* : Plate XIII: 1,6), Deir el-Medina (Bruyère 1939: 49 and Plate 42), Gurob (Spurrell 1891: 55), Kahun (Petrie 1891:12), Karnak (Debono 1982; Miller 1983) and Theban tombs (Seton-Karr 1905; Petrie 1909: 7 and Plate 22: 6-7; Mackay 1921). Burins, borers, sickles, geometric microliths used as transverse arrowheads, bifacially retouched knives, picks and adzes are among the well-defined tool types already identified from excavated New Kingdom contexts.

When the flaked stone assemblage recovered from the Workmen's Village is compared with the range of tool types noted on other excavated New Kingdom sites, its typological poverty is immediately apparent. There is nothing like the range of tool types found in the Akhenaten temple complex at East Karnak (Miller 1983), and although sickle elements recovered from excavations in the Main City can be noted among the flints from Amarna in the Fitzwilliam Museum, there were no sickles found in the excavations at the Workmen's Village, despite sieving. Only one tool was found in the Workmen's Village, a pick recovered from the midden rubbish in Q11 [2608] (Figure 11.1.3). However, insight into the technology of flintworking, raw material conservation and recycling and patterns of flaking can be obtained from the waste flakes and cores found in the site of the Workmen's Village, and the absence of a more diversified tool typology may itself reflect the specialised nature of the activities carried out in the Workmen's Village. If one of the primary activities of the workmen billeted there was connected with tomb construction, it may be significant that the one flaked stone tool found on the site is a pick, since flint picks are also connected with tomb cutting in Thebes both in the New Kingdom (Seton-Karr 1905; Mackay 1921) and earlier (Ginter et al. 1979: 71-74 and Abb. 25). Flakes which could come from thinning and resharpening picks were also noted in the flaked stone assemblage from recent seasons of excavation in the Workmen's Village (Figure 11.1.5-7).

The pick found in the organic midden layer of the Workmen's Village (Q11 [2608], no.7313) is a bifacially thinned oblong piece of light brown flint measuring 59 x 33 x 23 mm., weighing c. 65 g. (Figure 11.1.3). The remains of cortex on the back and patina along one edge suggest that a tabular slab of flint, perhaps exposed to weathering along an outcrop of flint located near the site or elsewhere in the Nile Valley was used as raw material. The pick is battered along all three working edges from heavy use, probably digging gravel, as the edges along the sides were subjected to the same wear as the leading edge, which would not be the case if it had been used to cut through limestone like the picks in the Valley of the Kings noted by Seton-Karr and Mackay. The transverse flake removal on the lower left distal end of the tool which cuts through the battered edge may be the result of either intentional resharpening or accidental flaking while digging through gravel. Battering extends over the edge of the flake scar on the proximal end, suggesting this may be the complete tool, which could have been hafted on a bent wooden handle such as those found elsewhere in excavations at Amarna. This pick could have been used to excavate or rob tombs dug into the sand and gravel of the terrace near the Village, to judge by the abrasion-smoothing of some of the flake scars, indicated in the drawing by dotted lines to

show the areas of the tool partially polished by the sand.

Flaking waste dominates the flaked stone assemblage from the Workmen's Village, as the following table (Table 11.1) shows:

Description	**No.**	**%**
Flakes	89	66.4
Blades	14	10.4
Cores		
flake used as core	1	0.7
other cores	4	3.0
chunks	25	18.7
Tools		
pick	1	0.7
hammerstone (broken)	1	0.7
Total	134	100.0

Table 11.1. Flaked stone from the Workmen's Village.

A fragment of one flaking tool, a pebble used as a hammerstone which split during use, was found in the Workmen's Village (Figure 11.1.4, Q11 [2608], no. 7313.3). Like the pick, this hammerstone was made of a tough, shock-resistant light brown flint. The pebble had a c. 2 mm. thick rind of cortex which would have cushioned the force of the blows it delivered before having been battered away through use on the working end, exposing the flint below the cortex.

Flaking in the Workmen's Village appears to have been limited to flint and chert. No patterned raw material reduction and flaking sequences could be identified in the occasional finds of limestone and basalt flakes which appear to be by-products of building work and grindstone breakage. Although waste from flaking and thinning translucent pieces of reddish-yellow chalcedony used in lapidary work was noted on the surface in a building compound in the southern suburb and in the area of the palace waste heaps in the Central City (Figure 11.2.6-8, cf. *COA* II: 45), flaking waste from lapidary work on this material was not noted in the finds excavated from the Workmen's Village. While a survey of flint resources in the area of Amarna will be necessary before patterns of the exploitation and distribution of this material in the New Kingdom can be reconstructed, flint and chert pebbles in the Nile terraces underlying and above the occupied area were likely to have supplied the New Kingdom knappers with raw material, and the occurrence of patinated surfaces on flakes and cores from the Workmen's Village suggests that Palaeolithic flint sites in the area surrounding the city (French 1984) could perhaps also sometimes have been used as sources of raw material whose suitability for flaking had already been demonstrated. Another possible source of flints with patinated surfaces could be flat spalls from the weathering of patinated chunks such as those found on the hill behind WV [2622] above the Workmen's Village (see below); according to Spurrell's study of the Amarna flint industry weather-spalled flat pieces of flint were sometimes gathered for later use (Spurrell 1894: 37).

This preliminary report on a single season's study of flintworking at Amarna deals with 42 flints collected from 8 seasons of excavation in the Workmen's Village as well as with a group of 92 flints, WV [2622], many of them apparently struck off the same block or nodule of light brown banded opaque flint (cf. Spurrell 1894: 37), which were found in an area of c. 2 m. diameter (in grid squares W24, W25, see Figure 4.7) in a sandy layer above the spoil lying outside the entrance to a tomb dug in the gravel terrace to the east of the Workmen's Village. In the limited time available for study in the field, no refits could be found but more work on this material is needed. While the two assemblages, taken together, indicate features of flaking technology which provide interesting insight into the craft of knapping as it was practised during the occupation of the site in the New Kingdom, only a small number of artifacts are dealt with in this preliminary report. The limited area of the New Kingdom occupation of the overall city which they come from and the differences in flaking habits which can be noted even between

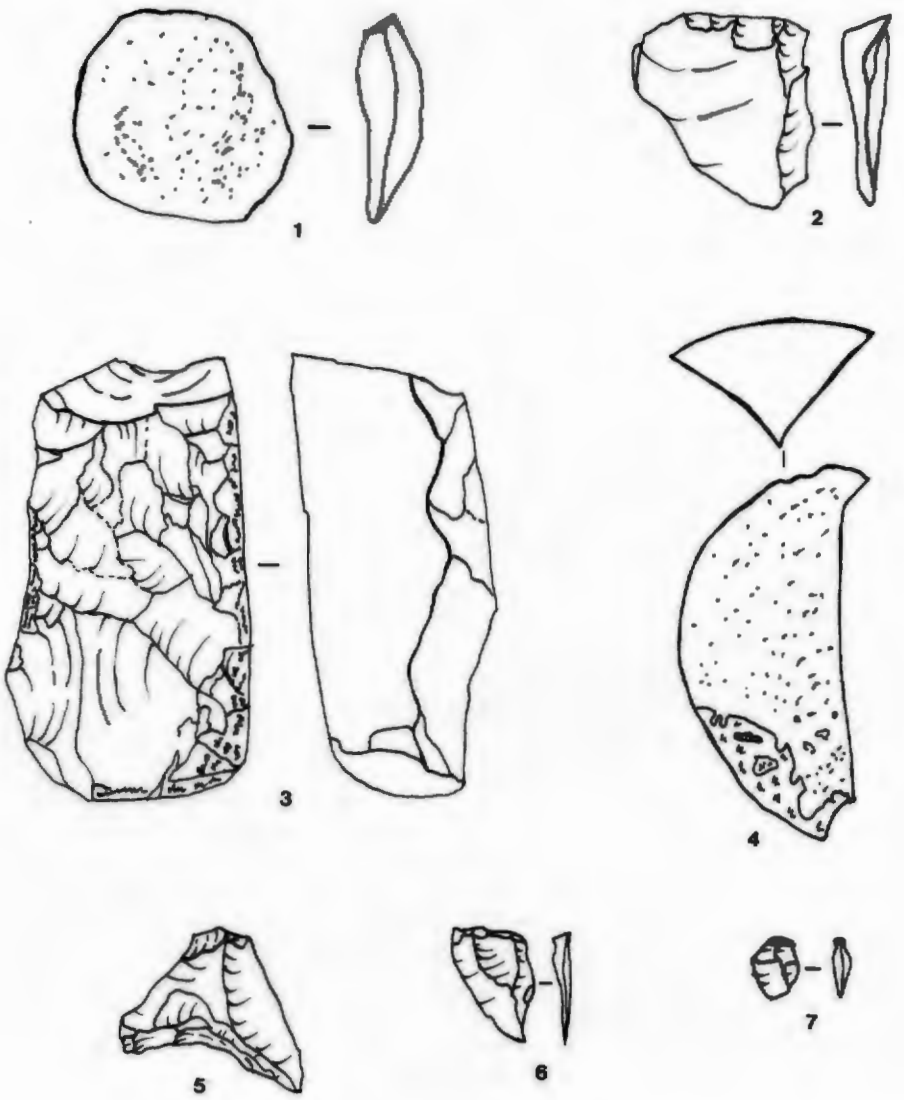

Figure 11.1. Flints from the Workmen's Village. Waste flakes (1-2, 5-7); pick (3); broken hammerstone (4). Scale 1:1.

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these two limited samples of approximately contemporary flint flaking waste suggest considerable caution is needed in interpreting the results or in taking them as representative of anything more than a limited number of episodes of flintworking which may not include anything like the full range of knapping skills, goals and achievements to be found in Amarna during the New Kingdom.

11.1 Cores

One possibly significant contrast in flaking technology between the flaked stone assemblages from the tomb spoil in WV [2622] and the Workmen's Village is in the absence of cores from the former assemblage, despite the presence of crested blades and flakes in the flaking waste from this location. Although the flaking waste from the WV [2622] tomb spoil group is what would be expected from roughing out blade cores from nodules or blocks of raw flint, with 6 partially and completely crested flakes and blades (e.g. Figure 11.2.2) from flaking and in one case abrading guide ridges for blade removal, no blade cores were found around the tomb spoil. Since this is a surface assemblage, and is located on the slope above the Workmen's Village any cores produced could have rolled downhill or have been removed at almost any time. However, separation

between places where cores were roughed out and places where cores were worked to produce blanks for tools has been noted in Early Bronze Age assemblages in Mesopotamia (Miller 1985) and the Aegean (Torrence 1986), and it is possible that the WV [2622] group of flints represents flaking waste left behind after the manufacture and removal of cores prepared for blade production somewhere else. The testing of the hypothesis that this tomb spoil assemblage represents waste debris from the production of blade cores would depend on the identification and study of more complete assemblages of New Kingdom flaked stone working including finished or rejected roughed out blade cores elsewhere in Egypt, and the comparison of the dimensions and technological features of the flakes in these assemblages with the waste flakes from the tomb spoil in WV [2622]. Although no New Kingdom blade cores were found in East Karnak, tools from the Akhenaten temple complex were usually made from blade blanks, and contemporary blade cores and waste from making blade cores has been noted on the west bank at Thebes (Debono 1971), including The Valley of the Kings (Miller 1983 and in press) where good flint raw material appears to have been a by-product of digging tombs into limestone with flint nodules suitable for flaking (Weeks, p.c. June, 1979).

Five cores ranging from 32 to 70 mm. in height measured along the principle flaking axis were found in the Workmen's Village. The considerable variation in core morphology, with each core representing a different flaking strategy, could suggest opportunistic flaking of whatever material was available by competent but unspecialized knappers. The types of core worked included a flake used as a core (Newcomer and Hivernel-Guerre 1974), a parallel flaked core for the production of parallel-sided blade-like flakes, a centripetally flaked core on a split pebble, a polymorphous core on a weather-spalled patinated piece of flint, and an aborted core on a patinated chunk which had to be abandoned because the raw material used was already too shattered and split to work. The number of striking platforms on these cores ranged from 1 to 4, and with the exception of the aborted core 5 or more flakes had been successfully struck off each of these cores, allowing the knappers to choose from flakes ranging from 10 to 55 mm. long, with three of the cores producing at least one flake 25-30 mm. or more long which could have been used as an unretouched cutting edge (cf. White, et al. 1977: Figure 2).

The five cores from the Workmen's Village show the economy with which flint was used. Patinated surfaces on three of the cores show that flint which may have already been flaked at an earlier period was being recycled, and one of these cores from WV 81.L10(1), no.1623 (Figure 11.2.5) was a flake used as a core from which a number of fresh flake removals had been struck from opposed striking platforms located on the ventral and dorsal surfaces of the flake. The height of this core was only 32 mm. and the dimensions of the flake removals whose flake scars are preserved ranging from 10 to 16 mm. in length, are on or under the lower end of the range of flake dimensions used as cutting edges in ethnographically attested industries producing a similarly small size of unretouched flakes for sharp working edges in recent times (White 1969; White, et al. 1977). Only one of the flake scars on this core from Amarna has a hinge termination which could have inhibited further flake removals from this flaking face and the use of opposed striking platforms to maintain a convex core flaking face from which further series of flake removals could be continued (Bordes 1947) meant that the knapper may still have had hopes of obtaining potentially useful 20-30 mm. long flakes. This could explain why before the core was abandoned 8 more blows were struck 2-6 mm. in from the edge of the striking platform, leaving incipient cones of percussion which irreversibly crushed the raw material below where the blows were struck without success in obtaining any more flakes.

Tiny retouched bladelets 15-16 mm. long are typical of terminal Upper Palaeolithic industries in the Levant (Bergman in press: Figure 78.9 and 21) and terminal Palaeolithic industries in Egypt (Wendorf and Schild 1975: Figure 30g). In a parallel ethnographic industry, the Duma of Papua New Guinea haft flakes of the size which the cores from the Workmen's Village would have produced (White 1969), but no hafted flints were found in the Workmen's Village despite sieving. Transverse arrowheads could be made from flints of this size, but if some of these Amarna flints would have eventually been hafted as transverse arrowheads such as those found in New Kingdom tombs they might have been used and lost hunting off site, and finished examples would probably be found only in areas where hunting tackle was manufactured or stored.

The degree of effort which the flintworkers in the Workmen's Village were willing to invest in unsuccessful attempts to flake unpromising material can also be seen in the aborted core from

WV Q11 [2608], no. 7313.2 (not illustrated). Two striking platforms were used, with the would-be core flipped over between two series of attempted flake removals from a patinated chunk whose dimensions of 32 x 34 x 21 mm. meant that flakes of no more than 20-30 mm. could have been produced even if flaking had been successfully carried out. The scars of the attempted flake removals show that both ended prematurely in hinge fractures after stopping short at 18 and 19 mm. instead of running fully down the surface of the core flaking face. The blocky, stepped fracture of the scars indicates that both flakes failed to achieve a clean fracture even before hinging, and incipient cones of percussion 3 mm. in from the edge of one striking platform show repeated attempts were made to clean the debris of one of the hinged flake scars by removing another flake from the same striking platform perhaps using a hammerstone too light for effective flaking as well as inaccurate placement of flaking blows (cf. Newcomer 1970). After turning the core around and trying to flake from the other side but only succeeding in crushing a new striking platform the core was discarded when it became apparent that it simply could not be worked. The interest shown in attempting to flake such unpromising material suggests that even poor raw material might have been in limited supply in the Workmen's Village, an impression which the relative scarcity of flint finds from excavation in this area does nothing to dispel.

11.3 Waste flakes

Since cores are completely absent from the surface collection from tomb spoil WV [2622], and since only five cores were found in the Workmen's Village, a fuller characterisation of patterns of flaking current in the areas of the site studied so far can be obtained from the study of evidence of knapping habits and accidents preserved on the flakes themselves, where evidence of core preparation and flaking strategies at earlier stages of production can be noted.

The waste flake assemblage WV [2622] from the tomb spoil outside the Workmen's Village (Figure 11.2.1-4) includes both flakes (61) and blades (14). A total of 28 flakes, many apparently from from trimming or thinning cores and bifacially retouched tools were excavated from the Workmen's Village. No blades or blade tools were found in the Workmen's Village, which suggests that the production of blades which took place outside the Village was for use elsewhere in Amarna. As only a few blades were found in WV [2622], they will be considered together with the flakes from the tomb spoil for most characteristics of flaking technology.

The contrast in flaking technology between the Workmen's Village and the knapping waste outside the tomb on the slope east of the village can be seen most clearly in the dimensions of complete flakes from both contexts. The average length of the 70 complete flakes from the knapping scatter is 49 mm. with a standard deviation of 14.6, and the lengths of these flakes range from 18 to 99 mm. Flakes from the Workmen's Village tended to be much smaller with an average length of 16 mm. for 20 complete flakes which ranged between 6 and 41 mm. in length, with only three flakes greater than 26 mm. long.

While flakes without cortex (12/21) were more frequent than flakes with cortex (9/21) in the Workmen's Village, the relative proportions of cortical and non-cortical flakes were reversed in the knapping scatter outside the village in WV [2622], where cortical flakes slightly outnumbered flakes without cortex (38 to 37). This may reflect the tendency of flintworking outside the site to be concerned with an earlier stage in the flaking of raw material. Primary and secondary cortical flakes with no earlier flake scars or only one or two minor flake scars on the dorsal surface were found in both the Workmen's Village and in the surface knapping scatter of WV [2622]. The example of a primary cortical flake from the Workmen's Village illustrated (Figure 11.1.1) shows that unmodified flint nodule surfaces were being flaked in the Workmen's Village, either to prepare cores for further flake removals or during roughing out picks from gravel pebbles. Some reuse of material flaked at an earlier period may be indicated by the presence of patinated surfaces on 5 flakes from WV [2622] and 2 flakes from the Workmen's Village, although this may be naturally broken patinated flint.

Contrasting flaking strategies between the flints from the Workmen's Village and the WV [2622] knapping scatter also emerge from the classification of the waste flakes from the two locations using a technique developed by Harding (Gingell and Harding 1981). In assemblages where blades were being manufactured the point of percussion is located either behind a single central ridge (Type I flakes, cf. Figure 11.2.1-2) or a double ridge (Type II flakes, cf. Figure

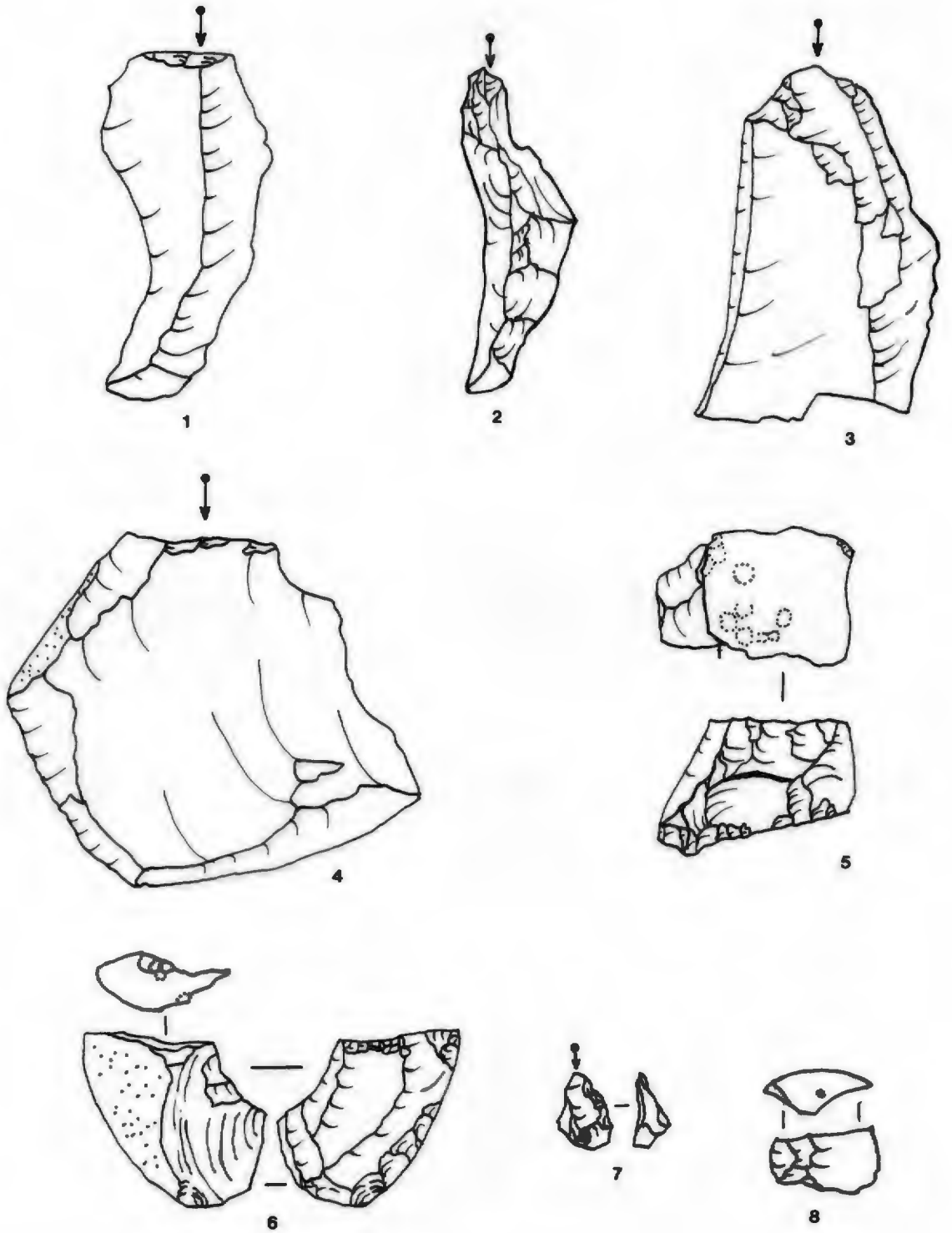

Figure 11.2. Flaking waste from [2622], tomb spoil outside the Workmen's Village (1-4); flake core from the Village (5); lapidary waste from the Main City (6-8).

11.2.3). These ridges guided the force of the blow and enabled knappers to maximize the length of flake removals, while in other assemblages flakes without a central guide ridge (Type III, cf. Figure 11.2.4) predominate (Gingell and Harding 1981; Bergman and Ohnuma 1983). Two thirds of the flakes (50/75) from the surface knapping scatter outside the tomb east of the Workmen's Village were single or double ridged Type I and II flakes, providing further support for the

interpretation of this assemblage as waste from blade core manufacture, while only one third (25/75) were expanding flakes without a central guide ridge. In contrast 10/17 flakes (59%) from the Workmen's Village were Type III flakes and only 7/17 (41%) had been flaked down a central guide ridge.

In both flake assemblages the Amarna knappers tended to prefer unmodified striking platforms. Plain butts predominate in both the flakes from the WV [2622] knapping scatter (59/73, 81% of flakes whose proximal flake features could be determined) and from the Workmen's Village (11/18, 61%). A total of 5 facetted butts, 2 punctiform butts and 7 crushed butts were noted on the flakes from WV [2622]. Crushed butts were the second most common type of butt on the flakes from the Workmen's Village (5/18), which may be related to the thinning and resharpening of picks, as crushed butts are common accidents during the flaking of bifacially thinned pieces, and during any knapping where flaking blows are delivered close to the edge.

Flake terminations show the skill of knappers in controlling flake removals both in the WV [2622] flint scatter from the tomb spoil outside the Village and in the village itself. Sharp flake terminations were twice as frequent as hinged terminations in both contexts. Out of 46 flakes from WV [2622] where flake termination could be determined 31 were sharp, 15 were hinged, and none was plunging. In the Workmen's village there were 9 sharp and 4 hinged terminations. Evidence of the relative frequency of hinged flake removals at earlier stages of flintworking is also preserved by dorsal flake scars. Only one undercut hinge scar was noted on 17 flakes from the Workmen's Village and 52/75 flakes from WV [2622] had no undercut hinge scars on their dorsal surfaces indicating that as with the complete flakes from this context approximately two thirds of flake removals were sharp. The orientation of undercut hinge scars on the flaking waste from the WV [2622] flint scatter suggests that flaking tended to be from single platform cores prepared by cresting, with 15 axial undercut hinge scars from earlier flake removals oriented in the same direction as the flakes whose dorsal surfaces they appear on and 8 transverse undercut hinge scars, half of which were noted on crested flakes. The absence of undercut hinge scars from opposed striking platforms might perhaps be further evidence of the manufacture, but not the final reduction of blade cores. Knappers often need to set up opposed striking platforms to keep the flaking face of blade cores convex when removing repeated series of blades (Bordes and Crabtree 1969; Sussman 1982), but roughed-out cores prepared for later blade production tend to be single platform cores (Torrence 1986).

The relatively low frequency of hinged flake terminations may be related to the Amarna knappers' habit of removing proximal overhang below the striking platform after completing a series of flake removals, which was noted on all four of the successfully flaked cores from the Workmen's Village and was a common feature of New Kingdom blades from East Karnak (Miller 1983: 228). When blows from flaking tools are to be directed close to the edge of the striking platform, removing the edges of the relatively deep negative scar left by the bulbs of percussion of earlier flake removals below the striking platform on the flaking face of the core enables a clean blow to be delivered at the optimum flaking angle to enable a longer flake or blade to be struck off with a better chance of avoiding hinge fractures (Bordes 1947: 7-9, Figures 3.5-6 and 4.5-6). While 29 of the flakes from WV [2622] were struck from cores which had not been prepared by overhang removal, the majority of flakes from this knapping scatter (42/71 where proximal features could be noted) showed evidence of proximal overhang removal (cf. Figure 2.1-2 and 4). These relative proportions are reversed in the flake assemblage from the Workmen's Village where only slightly more than one third (5/14) flakes showed proximal overhang removal (cf. Figure 1.2, 5-6) and a little less than two thirds had been struck off pieces without removing the proximal scars of earlier flake removals (9/14). The flake sample from the Workmen's Village is considerably smaller, but the reversal of the proportion of flakes with overhang removal may perhaps be correlated with the significantly shorter run of flakes from this part of the Amarna flaked stone industry which has already been noted.

Other technological features of the Amarna waste flakes can be briefly noted. One Janus flake from the knapping scatter WV [2622] outside the entrance to a tomb on the slope east of the Workmen's Village had a bulb of percussion on both the ventral and dorsal surfaces which showed it had been struck off the proximal end of a flake used as a core (cf. Newcomer and Hivernel-Guerre 1974). A blade butt and a flake tip from WV [2622] had intentional break facets which could have been the result of deliberate blows to make blanks for tools (cf. Bordes 1953;

Bergman et al. 1983), as intentional breaks occur on New Kingdom flakes and tools from East Karnak and Memphis.

Accidental features of flakes from WV [2622] and the Workmen's Village were also noted. Of the flakes from the WV [2622] knapping scatter 10 had axial split facets, a characteristic accident of hard hammer flaking where the flake splits in two down the axis of percussion as it is being struck off the core (Bordes 1979: 40, Figure 4.2; Tixier, et al. 1980: 103, Figure 45). No axially split flakes were noted from the Workmen's Village. Incipient cones of percussion from mis-hit blows which failed to detach flakes were noted on the butt of one flake from the WV [2622] knapping scatter and on the dorsal surfaces of another three flakes from the same context. Two flakes from the Workmen's Village had incipient cones of percussion on the butt, which may have been the result of trying to flake the tough chert pebbles of the terrace gravels; in experimental flaking of this material in Amarna in 1986 more than one blow was sometimes needed to detach a flake, leaving incipient cones of percussion on the butt of the flakes which were eventually produced.

11.4 Conclusion

Three kinds of flaked stone assemblage were identified in this preliminary study of New Kingdom flintworking at Amarna. Manufacture of blades and tool blanks occurred in WV [2622], while in the Workmen's Village cores were worked to produce flakes c. 15-30 mm. long and bifacial pieces, notably picks, were apparently resharpened after use. The evidence for lapidary work is potentially one of the most interesting aspects of stoneworking, as translucent lumps of chalcedony could be worked to remove bits of yellowish stone so that objects could be produced which would be classified as carnelian after flaking and polishing had been completed. As Spurrell noted, there is a tendency to describe material from rolled translucent flint pebbles as semi-precious stone (1891: 51).

The separate distributions noted for these three sorts of flaking can be correlated with evidence for flaked stone from earlier phases in the excavation of Amarna. Ian Shaw's analysis of finds from excavations at the site in the 1920s shows that flint was the seventh most common material recorded in the southern suburb overall (p.c. July 1986). This was an area where artisanal activity appears to have been widespread, and the relative frequency of flint, c. 2.5%, is in the same 2-3% range as alabaster, wood, bone, leather/hide and shell, all materials which can be worked with flint tools. However, not all houses in the southern suburbs had flint tools, which were noted in only 9 out of 65 residential units (*COA* I). Even lower frequencies of flint tools were recorded in the North Suburb, where flints were found in only ten out of more than 200 residential units (*COA* II). Although different rates of recovery of flint by different excavators are likely to have affected the pattern, the 1981 excavation of the spoil heaps from Pendlebury's work in the North City suggests that the lower relative frequency of flint finds recovered in the North Suburb may reflect its actual pattern of distribution in this area (Shaw, p.c. July 1986).

Waste debris from thinning carnelian was noted on the surface in the southern suburbs and in the palace waste heaps (Figure 11.2.6-8) and in earlier excavations in this area of the city the presence of carnelian, but no flint tools, was noted in a priest's house in the southern suburbs, O49.1 (Shaw, p.c.). Carnelian debris was also noted in a rich estate in the North Suburb, T36.36, during earlier excavations, again in a context from which no flint tools were recovered (*COA* II: 45).

The location of the WV [2622] flaking waste from blade core manufacture outside the perimeter of the Workmen's Village may be significant. Since flintknappers reducing blocks of raw material to blade tool blanks can work through about 100 kg./day, it makes good sense to locate flintworking ateliers and surface heaps of flaking waste outside residential areas to avoid injury to bare feet or damage to sandals from the razor-sharp edges of waste flakes (cf. Gallagher 1977). In the early 1890's heaps of flaking waste were noted near the entrance to the southern city (Spurrell 1894) but the subsequent expansion of the modern village in this area appears to have obscured or eliminated these flint waste heaps.

The existence of a separation between areas where finished flint tools were found and areas where flint had been worked in bulk was first noted at Amarna nearly a century ago by Spurrell. He observed that flint "implements and waste flakes were found in two locations; the sickle flints

in presumably a workshop near the palace waste heaps, the rude flakes in a large heap in the south end of the town (1894:37)." Spurrell also recognised that the heap of flaking waste in the southern suburb included two types of flakes, many apparently struck off the same piece of raw material: "The artificial flakes consist of flat thin ones, and others of straight prismatic form. In both cases they were struck on the spot from the block, as is seen by the close resemblance of the texture, blots and stains in them" (1894: 37).

It is possible that the heap of flaking waste on the edge of the southern suburb was similar in technological characteristics to the waste flake assemblage WV [2622] from tomb spoil just outside the Workmen's Village (Figure 2.1-4), as the description of the two types of flakes noted by Spurrell suggests that they would have included both expanding Type III flakes and blade-like Type I and II flakes. Since the mixture of these two flake types is diagnostic of the early stages of blade manufacture (Gingell and Harding 1981), it seems reasonable to suggest that cores for blade production were roughed out in at least two areas on the outskirts of Amarna. Further survey and excavation on the edges of the city and in the area of the tombs outside Amarna may be able to detect additional scatters of flaking waste derived from the early stages in the manufacture of flaked stone tools during the New Kingdom.

It is hoped that further seasons of excavation and survey at el-Amarna may provide more information on the practice and distribution of a craft which on at least one occasion may have been able to supply Egyptian diplomats with gifts to be sent in relatively large quantities to southern Mesopotamia. EA14 iii 74 refers to 117 barber's tools, apparently flints (*CAD* M II 37) sent to the ruler of Babylonia. If these were flints, and not whetstones, the straight, razor-sharp edges of well-made blades would have helped barbers to give a clean shave without inflicting the nicks that flints which were probably equally sharp but irregular expanding flakes struck off unprepared cores left on the head of the *rais* of Mariette's dig when he used them to shave (Maspero 1903: I, 62-3, note 2). Since evidence for blade cores and blade core preparation dated to the New Kingdom can be identified at Amarna and near Thebes (Debono 1971; Miller 1983 and in press), it may be significant that blade tools, but no cores or assemblages of blade-making waste debris are found on late second millennium B.C. sites of the Levant, a region which Egyptian emissaries would have had to cross to reach southern Mesopotamia. The possibility that flaked stone could have been a relatively neglected component of the diplomatic networks of the Late Bronze Age in the eastern Mediterranean might indicate that archaeometric means of investigating the provenance of flaked stone lapidary work and tools could yield useful results.

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