Gero, Joan M

Genderlithics: Women's Roles in Stone Tool Production

Gero, Joan M, (1991) "Genderlithics: Women's Roles in Stone Tool Production" from Gero, Joan M & Conkey, Margaret, *Engendering archaeology : women and prehistory : Conference entitled* pp.163-193, Oxford: Blackwell Publishing

Staff and students of the University College London are reminded that copyright subsists in this extract and the work from which it was taken. This Digital Copy has been made under the terms of a CLA licence which allows you to:

* access and download a copy;
* print out a copy;

Please note that this material is for use ONLY by students registered on the course of study as stated in the section below. All other staff and students are only entitled to browse the material and should not download and/or print out a copy.

This Digital Copy and any digital or printed copy supplied to or made by you under the terms of this Licence are for use in connection with this Course of Study. You may retain such copies after the end of the course, but strictly for your own personal use.

All copies (including electronic copies) shall include this Copyright Notice and shall be destroyed and/or deleted if and when required by the University College London.

Except as provided for by copyright law, no further copying, storage or distribution (including by e-mail) is permitted without the consent of the copyright holder.

The author (which term includes artists and other visual creators) has moral rights in the work and neither staff nor students may cause, or permit, the distortion, mutilation or other modification of the work, or any other derogatory treatment of it, which would be prejudicial to the honour or reputation of the author.

This is a digital version of copyright material made under licence from the rightsholder, and its accuracy cannot be guaranteed. Please refer to the original published edition.

Licensed for use for the course: "ARCLG113 - ARCLG113: Lithic analysis"

Digitisation authorised by June Hedges

ISN: 0631165053

6

Genderlithics: Women's Roles in Stone Tool Production

Joan M. Gero

> *The most traditional technology of all, in every society, is the social technology of the division of labor which leaves woman with the most labor-intensive responsibilities of child and food production, and which defines her role as one that does not require tools.* . . . What is most urgently needed is to begin to define women as tool-makers and tool-users – which they have always been.
>
> E. Boulding, "Women, Peripheries and Food Production" (1978)

Introduction: Did Women Make Stone Tools?

Stone tool production, the bashing of rock against rock, is a male province by all accounts. "The most visible activity in the archaeological record is stone tool fabrication, an exclusively male endeavor" (Thomas 1983: 439). Or from a National Science Foundation reviewer,

> I would hardly have the temerity, in these enlightened times, to deny that there has been androcentrism in the reconstruction of the past (and in the recruitment of those chosen to do that reconstruction). Yet I remain unconvinced that there is any significant misunderstanding as to the fact that most prehistoric lithic production (unarguably the material with which we must work for the first million years or so) was produced by males. No doubt women made bags and baskets and cloths of numerous sorts for just as long . . . [and] in most cultures, past and present, ceramics were and are made by women. . . . No doubt also there are some historically documented reversals of these traditional sex roles, but . . . certainly there is no indication of a technological breakthrough that would require a seriously revisionist archaeology . . . (Anonymous, 1988)

This paper challenges the assumption that males alone are responsible for producing the stone tools that comprise so much of the archaeological

record for extended periods of prehistory. My critique, involving no technological breakthrough that allows sex to be assigned to artifacts, attempts a seriously revisionist archaeology with another kind of breakthrough: a theoretical perspective that recognizes gender as a dynamic and critical construct in social life and one that provides entry into studying the organization of prehistoric social labor. It will be a significant outcome of this study to show that engendering tool production does more than map females onto the prehistoric record; it also provides a framework for reconstructing gender relations as they are mediated by material culture.

The logic of this paper proceeds as follows. I begin by examining the current use and loading of the term "stone tool", turning then to question why males are so widely assumed to be the producers of this broad category of material culture and offering, finally, arguments for women's participation in stone tool production. In the second half of the paper I inspect a sequence of changes in stone tool technology from the highlands of Peru to identify women's roles in tool production and to interpret their significance.

What is a Stone Tool? Where Did This Definition Come From?

The study of stone tools, the material remains most closely associated with evolving hominids, speaks directly to the validation of being human. It is not coincidental that the early studies of stone tools and tool-makers (Holmes 1897; Wilson 1899) occurred in the heady flush of newly accepted evolutionary theory (Kehoe 1987); while ethnologists analyzed contemporary savages and barbarians for evidence of the successive ages and stages through which humanity had evolved and progressed, archaeologists unearthed direct evidence of brutish early man from the material record (Kehoe (1987: 3). Spearheads and axes, weapons and implements fashioned out of stone, were identified as the essence of man's rude beginnings, savage, indeed, as beginnings must be, but also full of the clever promise that makes them appropriate hallmarks of human ability. Accompanying this early attention to the forms of stone tools were the related attempts to understand their technology of manufacture, and different tool forms were frequently replicated in experimental undertakings during the late nineteenth and early twentieth century (Hester and Heizer 1973; Johnson 1978), to identify the nature and capacity of early man. (And note please: "man" is not a semantic generalization – such tools were seen, without doubt, as the products of male labor.)

The definition of what constitutes a tool, then, is intimately wrapped

up in how Man-the-Toolmaker demonstrates his human-ness. Tools are the standard by which Mankind can be measured. "Tools provide a thermometer for measuring intellectual heat" (Laughlin 1968: 318), as though making tools is what man does and, once made, these tools have completed their function: to bear testimony to man's abilities. Today's lithic analysis has not completely outgrown these beginnings but still focuses on the production and final forms of elaborately finished tools, with only secondary regard to the range of economic and cultural goals accomplished by tools. The most primary distinctions in lithic analysis are still made between the end-products of the manufacturing sequence, "tools", and the by-products of manufacture, cores and debitage, so that the production sequence rather than use-applications still predominates in tool analysis. These distinctions are underscored by further classifactory groupings: artifacts that were obviously used but that had not been subjected in the productive stages to being made into a standardized shape are referred to not as "tools" but as "utilized flakes", or even more emphatically as "unretouched flakes", with the emphasis retained on the amount of production – or lack of it. Tools, it is clear, is a term retained for categories of elaborated retouched artifacts with formal structure, although the question is clearly begged: when does one "use a tool" and when does one "utilize a flake"?

In fact, of course, "utilized flakes" *are* tools, although in the literature, "tools" are still frequently comprised of only standardized, classifiable, reproduced forms of worked stone. Thus, Hayden writes that among the Australian aborigines he was surprised to confront "the unbelievable lack, or rarity, of what the archaeologist calls 'tools'. At first I saw Aborigines using only unretouched primary flakes for shaving and scraping wood, and unmodified blocks of stone for chopping wood. None of these would have been recognized archaeologically as 'tools'" (Hayden 1977: 179). Or again, Binford and Binford categorize Middle Paleolithic artifacts in five general classes: Levallois flakes, non-Levallois flakes, cores, waste flakes, and utilized flakes, and then they *exclude* the final category of utilized flakes from their graphed results "because they are not diagnostic and because their quantity is such that they tend to distort the graph" (Binford and Binford 1966: 263–4).

As Hayden suggests, part of the conventional loading of the term "tool" towards elaborated and retouched forms derives from the real difficulty that archaeologists have had in recognizing unretouched flakes that may have been used as tools. In lithic studies expressly designed to detect artifact use, the term "tool" (or tool-edge) is applied much more generally to any stone that exhibits evidence of having been used, and a much broader, more inclusive range of artifact forms is covered by the "tool" term. In functional analysis, and especially in use-wear studies

where microscopic analysis of an artifact's edge may reveal evidence of how it was used, the identifying criteria are turned around and *use* defines tool-ness, clarifying the distinction between unused flakes and tools.

But microscopic use-wear evidence is the exception and is relatively recent, and in general the flake vs. tool distinction upholds the larger archaeological paradigm; lithic studies are most frequently undertaken to erect a simple classification system that can be used as an adjunct to other spatio-temporal approaches, another tool, as it were, to sort culture groups on the basis of material culture correlates, to "measure intellectual heat", to erect a culture history of "man". Tools are identified on the basis of their typological characteristics and their redundant features in order to partition prehistoric time into knowable, comprehensible units. In so doing, lithic analysis has ignored large bodies of data consisting of *ad hoc* or expediently produced flake tools, the non-classifiable, not formally redundant tools that lack elaborate retouch. Adopting a broader definition of "tools" not only refines one of archaeology's central tenets but proves fundamental to a feminist analysis of tool use in prehistory.

Why is Making Stone Tools Perceived as a Male Activity?

If males making elaborated tools have been linked to the progress of mankind, other biases in modern lithic analysis also reinforce the equation of tools with male makers and users. Lithic studies have served as a venue for male and female archaeologists alike, and indeed, a relatively large number of women archaeologists have built reputations on, and made significant contributions to, the study of ancient lithic technologies (e.g. Juel Jensen 1982, 1988; Johnson 1977; Knudson 1973, 1979; Leudtke 1979; Montet-White 1974; Moss 1983, 1986; Purdy 1975, 1981; Torrence 1983, 1989; Tringham et al. 1974). But studies undertaken by women are not representative of the range of interests in lithics, and entire areas of modern lithic studies include virtually no women investigators. Most notably perhaps, flint knapping, where archaeologists replicate lithic production techniques, is exclusively a male arena (e.g Bonnichsen 1977; Bordes 1968; Bradley 1975; Bryan 1960; Callahan 1979; Clarke 1982; Crabtree 1967, 1972; Flenniken 1981, 1984; Kelterborn 1984; Madsen 1984; Neill 1952; Newcomer 1971; Sheets and Muto 1972; Sollberger 1969; Titmus 1984; Tsirk 1974; Witthoft 1967; Young and Bonnichsen 1984). While many women archaeologists have learned to knap (e.g. personal experience), there is

virtually no published literature by women as flint knappers: knapping is publicly male territory.

Not only do only male archaeologists make stone tools, but the tools experimentally reproduced by modern (male) flint knappers duplicate the narrow definition of tools as highly formalized, elaborately retouched and morphologically standardized. As noted by Johnson (1978: 355), the single most frequently replicated artifact is the projectile point, especially the fluted point. After the point come other technically demanding tool forms such as Egyptian predynastic flint knives, prismatic blades, Levallois cores, polished celts and axes, all technologically difficult and requiring a long sequence of manufacturing steps and, usually, a high quality raw material. The male gender-loading on tool production is maintained by modern males reproducing only the conventionally circumscribed range of tools by which Man-the-Toolmaker is evaluated and measured.

It is also exclusively male archaeologists who experimentally use replicated, standardized tools in modern, analogical activities (in contrast to research such as Tringham et al. 1974, or Juel Jensen 1982, which test fresh flake edges for micro-wear). Note too that the modern man-made tools are used in highly selected activities to recreate ancient man/"real man". Fastened into reconstructed haftings, attached to spears, arrows, darts, and shafts, these experimental testing programs have in common an overwhelming emphasis on tool use in exaggeratedly "male" activities, especially hunting (Flenniken and Raymond 1986), butchering (Elliott and Anderson 1974; Hester et al. 1976; Odell 1980), spear throwing (Odell and Cowan 1986; Spencer 1974), and the particularly popular combined "research" endeavor of throwing projectiles into, and carving up, modern analogs to big game (Butler 1980; Frison 1989; Huckell 1982; Park 1978; Rippeteau 1979; Stanford 1979), as well as felling trees (Coutts 1977; White 1977) and making bows or arrows (Miller 1979; White 1977). This research often oversteps the fine line dividing imaginative science from popular ideas of the past, filled with rugged men doing primal things – and the media coverage responds accordingly; shooting arrows into newly killed and (importantly!) still warm boar strung up in wooden frames (Fischer et al. 1984) illustrates a particularly lurid design in which only males participate. (In contrast to males' programs, women's experimental lithic studies focus on such things as nutting (Spears 1975), leatherworking (Adams 1988), grain harvesting (Korobkova 1981), and woodworking (Price-Beggerly 1976), all of which are done with unelaborated and non-standardized stone tools.) If male archaeologists are replicating anachronistic stone technologies for purposes other than reiterating an elemental association of males with stone tool production and use, their reenactments nevertheless

project and keep alive, as *male*, the reduction of nature through stone.

A final area of lithic studies that consistently underrepresents both female investigators and female tool-makers/users is the ethnoarchaeological observation of "stone age" peoples. Based on males' ethnographic observations, it is again almost invariably males who are observed producing and using stone tools (Holmes 1897; Miller 1979; White 1967, 1969, 1977) in a narrow range of male-related productive tasks. Ethnos males are recorded or filmed making projectile points, fashioning arrow shafts, felling trees, grinding axes.

Ethnographically observed tool-making women occasionally figure into these scenarios as secondary players. For example, Richard Gould's study of Australian Aborigines notes that both males and females pick up and use sharp flakes for butchering and other domestic tasks (1977: 164). But even after pointing this out, Gould reverts to a study entirely devoted to males, and it is still only males and male tasks that are systematically observed:

> . . . approximately 20 of these flake knives are used by one person each year. Of course, women use these as much as men, and I might add here that women sometimes take a hand in the final finishing of wooden bowls too. Thus I am being arbitrary in referring to use of stone tools as male tasks, and I think it best to say so. (Gould 1977: 166)

But the recognition of female tool-makers and users is thereafter ignored, and data is tabulated as "Total amounts of lithic raw material needed *per man* per year" (Gould 1977: 166, emphasis mine), although we have been told that women use flake knives *as much as men*!

The point here is not accusatory but expository; male bias is systematically imposed on archaeological interpretations of tool manufacture and use, as constructs of archaeological interpretation interact with modern gender ideology. Modern, western males generally make tools and women don't. It is sometimes even postulated that only males are strong enough to make stone tools (but see Geis 1987). Modern gender ideology is underwritten by male archaeologists undertaking lithic studies that illustrate males making and using stone tools, appropriating this productive arena as male for as far back as humanity can be extended. The restrictive and self-fulfilling definition of stone tools as formal, standardized tools central to male activities leads to an anthropological overstatement about the importance attached to weapons, extractive tools, and hunting paraphernalia. The "maleness" of "tools" derived in this fashion ties back to control over the techno-eco/environment, as part of the same logical system that tacitly accords

priority to technoenvironmental factors to account for cultural change and human evolution (Meg Conkey, personal communication; Gero forthcoming).

Considerations for Women as Likely Stone Tool Producers

In contrast to the male-dominated areas of lithic studies that focus on (some) tool forms and on how (some) tools are made, a very different line of investigation asks how tasks were carried out with stone tools. And it is female investigators who, in disproportionate numbers, have worked from a functional perspective to study how tools were used, at the level of microwear analysis (e.g. Adams 1988; Bienenfeld 1985; Juel Jensen 1982, 1988; Lewenstein 1981, 1987; Mansure-Franchomme 1983; Moss 1983, 1986; Olausson 1980; Price-Beggerly 1976; Sale 1986; Unger-Hamilton 1984), macrowear analysis (e.g. Cantwell 1979; Knudson 1973; Stafford 1977), or assemblage composition (e.g. Arundale 1980; Gero 1983a, 1983b).[1] In doing so, women study the flake tools, the "non-standardized", "non-curated", "expedient" tools that are in almost all regards held to be inferior, based on contemporary values attached to time and form and ranking, and on the male-biased standards for tools that pervade lithic studies. If women's work has been observed cross-culturally to be devalued, in archaeology it is put to the study of the devalued "utilized flakes".

I now wish to examine the proposition that women in prehistory made stone tools. I will argue that women, at the very least, made many of the flake tools on which modern female archaeologists focus their studies and which modern female archaeologists replicate in experimental procedures. In the course of this argument I believe we will recognize much potential for women making a wider range of tools as well.

Let us start with the simplest assumptions: females comprised approximately half of all prehistoric populations, and these women carried out productive activities at prehistoric sites. We suspect, moreover, that women were especially visible and active in household contexts where they played significant roles in household production and household management (Moore 1988: 32). Almost ironically, women can be expected to be most visible and active precisely in the contexts that archaeologists are most likely to excavate: on house floors, at base camps and in village sites where women would congregate to carry out their work. Prehistoric women are probably disproportionately represented in densely concentrated areas of household refuse, and archaeological materials from the central areas of base-camp or house-floor excavations are at least *likely* to be associated with women's work.

As women work in association with such living areas, they need tools for the tasks they carry out. Although the kinds of tools women need would clearly vary from culture to culture and from task to task, it is inconceivable that they sat and waited for a flake to be produced, or that they set out each time to borrow one. Women clearly required ready access to efficient working edges in their routine work, and they must have manufactured them as needed. Since the user of a tool is in the best position to judge its adequacy, it makes sense that women produced many of their own tools, and indeed it would be most inefficient for them to rely on men for these needs.

Finally, women are both strong and smart enough to produce stone tools. The ethnographic, ethnohistoric, and experimental archaeology literature amply illustrates (or implies) that women make tools, although the unspectacular, routine nature of such activity mitigates against its being recorded as a distinctive undertaking: "[Women] undertake all the work except that alone of the grand chase" (*Jesuit Relations* 3: 101), although we also know that women in some contexts hunt as well (cf. Estioko-Griffin and Griffin 1981). The ethnohistorical observations of stone-using societies illustrate that women both make and use stone tools; in addition to flake tools and core tools made by Australian aboriginal women (Gould 1977: 166; Hamilton 1980: 7; Hayden 1977: 183, 185; Tindale 1972: 246), Tiwi women made axes (Goodale 1971: 155) and, in at least one instance, a companion to the Lewis and Clark expedition reporting seeing "squaws chipping flakes into small arrow points, holding the flake in their left hand, grasped between a piece of bent leather, and chipping off small flakes by pressure, using a small pointed bone in the right hand for that purpose" (Holmes 1919: 316).

Like men's tools, the kinds of tools made by women would be determined by a range of historical, material, economic, social, political, and symbolic factors; to generalize further about women's tools would be to reduce the category "woman" to one so broad and homogenized that it would be meaningless. We must be wary of reducing and simplifying the variations on gender divisions manifest in different societies, and even within single societies, as they relate to the production of technological artifacts. It is obvious that the division of productive activities by gender varies enormously from group to group, that what is exclusively males' work in one setting is females' work in another, and that women's control over a specific task in one context tells us little about that work falling to women in all comparable contexts. In addition, feminist scholarship has contributed important insights into how gender interacts with age classes and status rankings as relationships that organize productive activities (Gailey 1987; Moore 1988), and it is this richness in gender systems that makes gender a dynamic variable in social and productive relations.

To avoid an argument that would simply assign men to some tasks and women to others, we can better examine some of the common constraints on tool production for their gender implications; I will here consider four: scheduling, access to appropriate raw materials, biological strength and, finally, the symbolic significance of production.

Scheduling

Judith Brown argues (1970: 1077) that women's child-care responsibilities tend to restrict women to "repetitive, interruptible, non-dangerous tasks that do not require extensive excursions", thus setting up universal task restrictions for nursing mothers or for women with children three years of age or younger. Such universal prescriptions are widely debated and in fact rejected today, especially in reference to generalizations such as "women's roles" or "women's experiences" (see Coward 1983); certainly women in many societies share responsibilities for child care with other household members or other household units. Even if one were to accept Brown's argument, this hardly eliminates women's participation from stone tool production. Producing expedient tools requires only a single blow to a core and virtually no time at all. Even working formalized tools is not time consuming: an "average sized" projectile point is finished by a practised knapper in about 30 minutes (Holmes 1919: 313 and 328). If flying debitage is considered dangerous around young children, special tool preparation areas are easily arranged at a short remove from the house floor, and young children can always congregate elsewhere. There is every reason to believe that women in many stone-using contexts could regularly have found time and space to produce tools, and that tool production would have been localized within camps or villages or, many times, even within structures.

Access to lithic raw materials

"Accessing" or "gaining access to" lithic raw materials frames the problem of procuring stone in terms of obstacles, restrictions, and constraints; one gains access *despite* such barriers as distance, knowledge of sources, claims of ownership, payments, transport, divisibility of what's been acquired. In contrast, the idea of "control over" lithic raw materials renders such constraints invisible and suggests an immediate correspondence between wanting stone and having it. Clearly, who "accesses" stone and who "controls" stone provides a semantic loading

that is easily genderized in modern categories; women are allowed to access sources of stone while men control the flows of lithic material.

In fact, of course, the matter of attributing gender to stone procurement is difficult in any case, and the amount of women's control over appropriate raw lithic materials is difficult to reconstruct and probably highly variable. Ethnographic reports of stone-using people have often been interpreted to illustrate a pattern of male control over exotic stone. Gould, for instance, reports that among the Australian aborigines,

> quarries occur at or near sacred sites – that is, totemic "dreaming" places. People [*men* – J.G.] who believe themselves to be descended *patrilineally* from the particular totemic being at one of these sites will make special trips to the quarry to secure stone there. A *man* places a high value on stone from a site of his dreamtime totem . . . Because of his *patrilineal* relationship to the site, a *man* sees the stone as part of his own being – a fact which motivates him to carry the stone to other, distant sites . . . (1977: 164, emphasis mine)

This spiritual justification for why men and not women control the rare, imported, traded, or quarried stone materials is paralleled in other Australian contexts to rationalize male control over foreign interactions and exchanges: "Among the Yankuntjara people that I worked with, it appeared that there was a prohibition against women using cryptocrystalline rocks. . . . A similar prohibition was recorded in Central Australia by Spencer and Gillen [1912: 373, 376]" (Hayden 1977: 183).

A third observation focuses on the acquisition of grindstones in the western zones of the Australian desert regions where stone represents a scarce resource: "Men travelled to the known sources of stone, utilizing kinship ties with people in these areas. [The grindstones] were then handed over to their wives . . ." (Hamilton 1980: 8).

But other Australian accounts clearly report that while men flake the stone at quarry sites, it is women's work to carry it away (Jones and White 1988: 61 and 83). Thus, women clearly do partake in long-distance trade for "exotic" rock and certainly could have controlled such stone once it arrived "back home".[2] We also know that quarry sites were often visited by larger residential groups, presumably of both sexes, and that camps were established over longer time periods where huge quantities of flakes and partially reduced bifaces were removed (e.g. references to tipi circles associated with quartzite quarries of eastern Wyoming, or the evidence for habitations at Flint Ridge, Ohio, in Holmes 1919: 178 and 211). These reconstructions surely allow ample access for women to highly-sought, high-quality stone. Finally, the ethnographic glimpses of male-dominated trade for distant stone materials fail to address the question of control over local stone sources for tool production, and of course it is the flake tools of local materials that represent a vast majority of tools in the archaeological record.

Biological strength

Already alluded to, the issue of strength is addressed here because it is raised so regularly in discussions of sex roles, and because it lurks as an implicit objection to women's participation in stone tool production. Sex differences in upper body strength, significant in modern populations even when normalized for lean body mass (Fausto-Sterling 1985: 217, but see Lowe 1983), could be thought to have ramifications in tool production.

In fact, upper body strength is not an issue in making tools, where technique rather than force is determinate (John Clark, personal communication). Moreover, differential upper body strength gives us no reason to expect an activity like tool production should fall either to males or to females; we don't expect the division of sex roles to follow our own cultural categories of either rational efficiency or fairness. Women in fact are often found carrying out heavier labor tasks than males, as in the transport of heavy goods to market locations or gathering and transporting firewood. We can't even assume that stone tool manufacturing will always be divided by gender rather than by age or class or ability. Divisions or labor not only vary in all these dimensions but also in the degree of task specialization, that is, in how production sequences are divided up into specified tasks. A more meaningful question might ask, what stages of stone tool production could be divided between males and females in the course of producing specific tool types and, even more importantly perhaps, as played out in specific socio-historic contexts.

The issue of upper body strength might be significant only in very specific areas of lithic production: in quarrying raw stone from bedrock sources, in breaking apart large cobbles or large blocks of quarried stone to produce primary flakes, and in some pressure-flaking techniques, especially using an indirect punch. Female disadvantage in these areas could be significant enough for them regularly to fall to men. This presents more interesting alternatives for how gender might have been played out in stone tool production: under what circumstances would females and males have separate charge of distinct production spheres (for what types of tools? in which quarrying contexts?), and under what circumstances would gender tasks be specialized and complementary, towards a shared production goal?

The social value of tool production

It is in the realm of meaning, or social value, that women's participation in tool production must ultimately be considered. That women *can* and *do* make stone tools has already been shown. The questions of where and when women make tools, the kinds of tools they make, and the task-specialized jobs they perform within tool production, are more complex matters and will vary in different socio-historic contexts. Recognizing that social value is always attached to specific labor tasks and that males' labor is generally more highly valued that females', brings us directly to the question of how gender systems work: how do males control the labor that is more socially valued, and how do these gender roles in production activities come into being? Is some labor valued principally *because* it is performed by males? And how do we account for the apparent invisibility of women's labor? Finally, what social value would accompany the production of different classes of stone tools?

Flake tools by definition lack the investment of energy that we today, using a modern value system, accord greater symbolic and social importance. Where women regularly perform undervalued work, it is relatively simple today to associate the production of flake tools with women, with base-camp operations, with local materials, with simple production sequences. Devoid of social meaning, the common, expedient "utilized flake" naturally falls within a larger class of productive activities that women are not only allowed to perform but that are often associated by modern gender ideology with their lot. We find it easy to believe that women were allowed to do, perhaps were *only* allowed do, "meaningless" work, work without social value, such as flake tool production.

But these value loadings on stone tools can be questioned for prehistoric times. Terms like an "*investment of energy*" smack so thickly of modern values that we are forced to question the assumption that tools with more retouch automatically carried greater social status or importance than effective, reliable (throw-away? "expedient"?) flake tools. Are we sure that elaborately worked bifaces were necessarily more highly valued? Or does this "investment of energy" only today produce the expectation that formal "tools" were high class and made by men? Most central to this issue, would women have made elaborately retouched tools?

Everything we have considered up to this point suggests that they could have and probably did. It certainly can be argued that the implicit ranking (based on "energy investments") of projectile points at the top, other bifacially produced tools in the middle, and flake tools at the bottom, is a recent construct. Moreover, even if this value system held in

prehistory, there is no reason to exclude women's roles as producers of finely finished tools. We have ample evidence of other wealth items and highly decorated items that women were charged with producing. Schneider (1983: 106–9), for instance, discusses Plains Indian women making and dressing the ritual Sun Dance Dolls among the Crow, or doing the quillwork on high-status Pawnee shirts; Blackfeet women decorate tipis with paintings of war and hunting, and Gros Ventre women made beaded moccassins. Gailey depicts Tongan chiefly women as the makers of all *koloa*, valuables or wealth objects: "[Women-made] valuables were always superior to things made by men . . . Chiefly women's production of valuables validated other chiefly persons' status throughout life" (Gailey 1987: 97). In societies where female–male relationships are characterized by reciprocity and complementarity rather than by hierarchy and dominance, and where women are known to have held positions of power and respect, there is no reason to believe that women did not produce elaborate worked stone tools.

This brings us to the final query: are projectile points in a category by themselves? Do men have to have made the arrow heads? We have already noted one ethnographic example of women chipping arrow points, suggesting that the partitioning of labor is not determined solely by what it is that is being made. Instead, the division of labor will be conditioned by the context of social relations, and by the social and symbolic value placed on what is made. The projectile point in and of itself has no universal meaning. It *can* represent the cunning and danger of the hunt, where hunters are highly esteemed and where projectile points speak to control over the means of production, in meat as well as in stone. In such cases, projectile points may indeed provide a means of reproducing the male status as hunter and may be made by men. But this is not all cases. In other contexts, especially agricultural societies, small-game hunting is divested of these meanings and is conducted as an ancillary, secondary subsistence enterprise. Projectile points in these contexts convey neither cunning nor danger, dominance nor male status . . . nor would projectile points have to have been made by men.

What then do we know? Unilateral male control over lithic production, from flake to point, has crumbled in light of sociological, historical, experimental, and ethnographic evidence. Women can be suspected of making as many stone tools as men, and of leaving even more tools than men do in recoverable concentrations where archaeologists usually dig. Indeed, in hindsight it is illogical that the medium of stone should, by itself, have been thought to have deterministic power over the sex of those who would work it. Gender systems, deeply embedded in social relations of complementarity and/or hierarchy, cooperation and/or dominance, override any particular artifact medium.

There are no compelling biological, historical, sociological, ethnographic, ethnohistorical, or experimental reasons why women could not have made – and good reason to think they probably *did* make – all kinds of stone tools, in all kinds of lithic materials, for a variety of uses and contexts. On the other hand, direct gender attribution of individual tools remains problematic; women, like men, can't easily be sought at the level of individual tool producers. Thus, for purposes of elucidating the bare minimum level of female participation in stone tool production, I suggest we look at lithic assemblages that are (1) from dwelling or habitation areas where, because of occupation over many days, weeks or months, we are most likely to find evidence of maintenance tasks related to food, clothing, child-rearing; (2) made of locally available raw materials, to avoid arguments for or against differential male/female mobility; and (3) of "expedient" flake tools, leaving aside the highly retouched tools which, from our cultural perspective, conform to formal standards of tool morphology and are granted high social value. It is at this most minimal analytical and contextual level, which probably constitutes 90 percent of the archaeological record of stone tool manufacture, that we will surely "see" women. The remainder of this paper examines a particular context of stone tool production and use in the highlands of Peru, arguing that the work of women can be detected in this lithic tradition, and that the meaning of gender can be approached by these means.

Stone Tools at Huaricoto, Peru

Context of study

The lithic assemblages used in this study were excavated from the site of Huaricoto, a formative period temple with associated occupational components located in the Callejón de Huaylas intermontane valley of northcentral highland Peru.[3] The data have previously been analyzed to assess the potential of stone tools for carrying messages of social status and group identity (Gero 1983a, 1989). Here, changes in lithic technology will be reviewed to see how an explicitly gendered analysis refocuses the interpretation.

The site of Huaricoto is located at 2740 m on a small promontory on the eastern side of the Rio Santa, a north flowing river that is bounded by two parallel but contrastive mountain chains (figure 6.1). Both Cordilleras exhibit extensive post-glacial change, but outwash and erosional deposits are considerably more pronounced on the eastern, Cordillera Blanca side of the Callejón, a function of its higher, steeper slopes. Rapid glacial

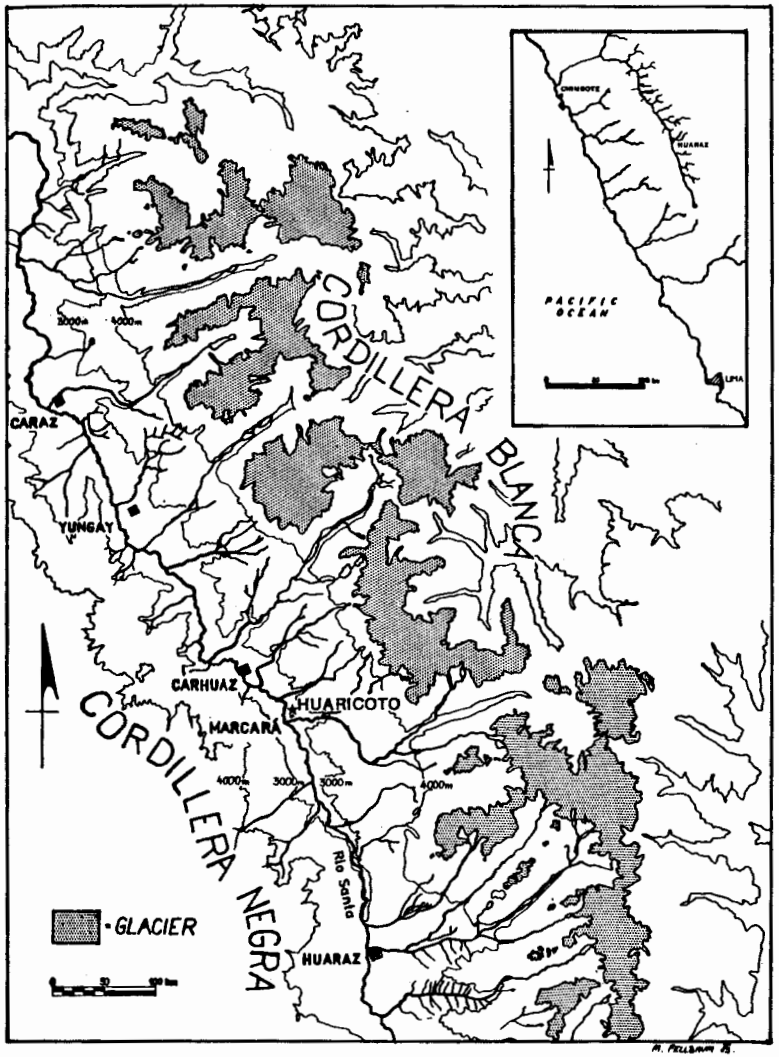

Figure 6.1 Callejón de Huaylas region showing location of site of Huaricoto.

melting has further contributed to these processes, depositing materials derived from the Cordillera Blanca on the valley floor where they accumulate in terraces running parallel to the mouths of the rivers emptying upper glacial lakes. It is on such a terrace of unsorted sands and gravels that Huaricoto is situated.

Occupation of the site spans approximately 2500 years, from the late preceramic period around 2000 BC through the Early Intermediate period/Middle Horizon at AD 600 (Burger and Salazar-Burger 1980). The earliest levels have exposed a ceremonial platform covered with yellow clay and constructed with several carefully prepared, sunken, clay-lined ceremonial hearths (Burger and Salazar-Burger 1985). Burger and Salazar-Burger (1980) interpret this stage as an unoccupied ceremonial zone that was visited and used only intermittently by mobile hunters and gatherers.

The introduction of ceramics at the site at about 1700 BC does not seem to accompany other large scale socio-cultural changes. Rather, a series of enlargements of the temple area through regular construction and filling of ceremonial hearths appears to continue out of the preceramic levels through the Initial period and Early Horizon phases. Terraces that buttressed the growing temple mound have been traced around the northern perimeter of the temple, and large elliptical areas defined by the erection of 3 m high dressed boulders ('huancas') were constructed during the later Chavin phases, setting apart an open plaza area in front of the temple and defining other ritual areas on the other side of the main structure as well (figure 6.2).

Because excavations at Huaricoto were largely directed to defining the temple and ceremonial areas of the site, the residential components are less well understood. Starting in the Early Intermediate period (EIP), however, large amounts of midden accumulation are apparent in the northernmost excavation sector, representing dense concentrations of domestic refuse from the rapidly expanded village that now reaches its maximum extent of 3 ha. This EIP development of a permanent village settlement associated with an older, strictly ceremonial area is paralleled at other highland sites.

Lithic materials from Huaricoto were collected from four excavation sectors (figure 6.2), which are detailed elsewhere (Gero 1983a, 1989). The four site sectors contributed unequally to the total lithic assemblage as well as to the representations of each cultural period. Sector I, the open plaza east of the temple, spanned the entire occupation of the site with particularly interesting quartz materials coming from two preceramic ceremonial hearths in the lowest levels. Sector II, the central temple area, yielded a low density of lithics and lacked the EIP strata corresponding to the residential occupation found elsewhere at the site for this time.

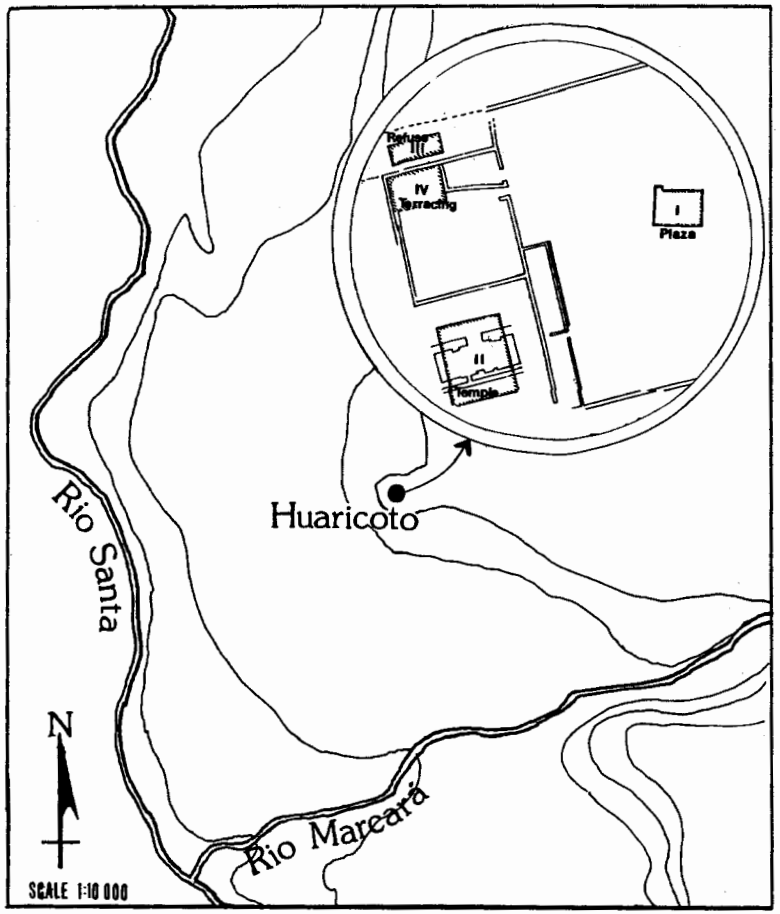

Figure 6.2 Huaricoto, showing distinct excavation sectors (inset courtesy of R. Burger).

Chipped and ground slate bifaces are noted throughout Sector II levels, mostly in a disfunctional broken or exhausted state, accompanied by a thin scatter of barely modified flake tools. Sector IV, represented by a series of supporting terraces north of the temple, apparently dates only to the middle period of Huaricoto's occupation: the two lower terraces are Initial period, and there is one upper Early Horizon terrace. Of special interest, the lowest terrace of Sector IV contained a well-defined

lithic workshop area, apparently corresponding to the production of bifaces recovered from Initial period occupations at Huaricoto. Finally, Sector III, the deep refuse area on the extreme northern edge of the temple mound, dates predominantly to the last (EIP) period of site occupation. This sector contained the greatest density of artifactual material in its midden strata, with few projectile points and an overwhelming proportion of expediently produced flake tools, while the lowest levels revealed a preceramic component of carefully prepared hearths and a few tools. Tool frequencies by cultural periods for the entire site are given in table 6.1.

Table 6.1 Size and structure of the Huaricoto lithic assemblage based on 1014 artifacts

	Flake tools	*Bifaces and projectile points*
Early Intermediate Period (n = 622)	636 (96%)	26 (4%)
Early Horizon (n = 74)	57 (77%)	17 (23%)
Initial Period (n = 247)	221 (89%)	26 (11%)
Preceramic Period (n = 31)	27 (87%)	4 (13%)
TOTALS	941	73

Inspection of the Huaricoto stone tools focuses on the three dimensions of lithic assemblages identified earlier as areas in which gender roles appear to interact with lithic production and use. Again, while none of these represents a simple correspondence of archaeological artifact with sex, each area has gender implications:

1 *Lithic raw materials.* Gender can obviously be used as a category to limit control over different types of workable stone.
2 *Degree of preparation of tool forms.* Gender has already been shown to be associated with "energy investments" in tool production, although we suspect this is largely a modern association. Minimally, women have certainly contributed extensively to flake tool production.
3 *Context of tool preparation and use.* Gender has spatial implications, with certain contexts and ranges of tool applications at least loosely suggesting female work areas.

Lithic raw materials

If we take the view that women enjoyed access to abundant local lithic materials rather than depending on imported quarried materials, we can

evaluate the Huaricoto lithic assemblage for the accessibility of the stone materials represented at the site.

As tabulated in figure 6.3, "local" materials are readily accessible from river cobbles or surface outcroppings close at hand: sandstones, quartzites, granites, and metamorphosed sedimentary rocks. These probably were taken from the nearby riverbeds of the Rio Santa, just 500 m below and to the west of the site promontory, or from the Rio Marcará flowing 500 m southeast of the site.

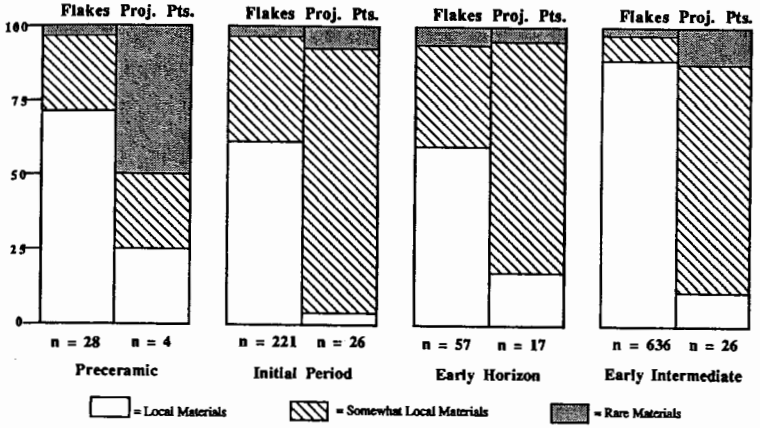

Figure 6.3 Artifacts grouped in categories of relative rareness of raw material.

"Somewhat local" materials include volcanic stones (tuffs, rhyolites, and andesites) derived from at least approximately 5 km away and from the other side of the Rio Santa (Wilson et al. 1967: 44–6). In addition, this group includes materials that occur in the Cordillera Blanca but are more difficult to obtain than the "local" materials because they are derived from lower geological beds and outcrop less frequently: rhyolites and tuffs, shale, slate, and caliz.

Finally, "rare" materials were imported from outside the Callejón de Huaylas or, minimally, were unevenly and sparsely available within the wider local region; these include obsidian, quartz crystals, and high-quality chert. Chert sources can only be identified in the Maroñon drainage at significant remove (Wilson et al. 1967: 26–7), while Burger and Asaro (1977) report that Callejón obsidian was imported from Quispisisa in Huancavelica, several hundred miles to the south.

The data in figure 6.3 indicate first, that although rare stone was used more often to produce bifaces than flake tools (12% compared to 2%),

no cultural component at Huaricoto exhibits a significantly high proportion of rare materials, with the possible exception of the unreliably small preceramic biface sample.

On the other hand, the pattern of using somewhat local materials for complex tools, and local materials for expedient tools, is apparent for all cultural periods; bifaces made of local materials show up as only 4% up to 25% of each biface sample, while the flake tools of local materials are never represented by less than 60% and reach as high as 89% of the flake tool assemblages. As well, somewhat local and rare materials account for between 82% and 96% of all the biface samples, while the same materials only account for between 11% and 40% of the flake tools.

A third trend somewhat obscured in the grouped data of figure 6.3 is the strong tendency towards the adoption of a single local material, a metamorphosed sedimentary rock here called "metashale", as the standard material for flake tools. During earlier periods of site occupation, metashale represented only 35% to 40% of the flake tool material while in the last EIP period, metashale dominated the flake tool assemblage with a representation of 62%. We return to interpret these findings after looking at the other lithic dimensions.

Degree of tool preparation

Tool preparation at Huaricoto can be assessed initially by a separation of "expedient" flake tools from the carefully worked bifaces that occur throughout the sequence. Table 6.1 showed that bifaces comprise between 4% and 23% of the total assemblage for any period, and that while the Early Horizon representation of bifaces is unexpectedly high, it is the dramatically low frequency of bifaces in the EIP that is most noticeable. Whereas in earlier periods, bifaces comprised between 23% to 11% of the assemblages, in the EIP only 4% of the lithics are represented by bifaces.

Not only do bifaces almost disappear in the later, more residential EIP sample, but even the flake tools exhibit less preparation. Measuring the percentage of flake tools with cortex remaining on the surface shows an increase of residual cortex in the EIP: 57% of flake tools retain some cortex, compared to measures of 43%, 49%, and 63% in the three earlier periods.

Finally, the amount of retouch per flake tool was calculated for a subset of the Huaricoto materials and can be simply summarized (cf. Gero 1983a: 139): a slight but consistent trend demonstrates that tools from later occupational periods show less retouch, measured both by shaping and thinning flake scars, than tools from the earlier periods. A fair summary of the amount of investment in tool preparation over time at Huaricoto is simply that *more tools* are made expediently, and tools are made *more expediently*.

Context of tool preparation and use

The contextualization of Huaricoto lithics rests on recognizing the overarching change in site function from the preceramic/Early Horizon occupations when the site was dominated by its ceremonial aspects, to the later EIP occupation associated with a village population and residential functions. All time-transgressive trends must be interpreted in light of this contextual shift.

Projectile points and bifaces are overrepresented in the earlier strata and, significantly, in the "ceremonial sectors" of temple and plaza (Table 6.1). Most of these were recovered in a much reduced or broken, expended state although a number of unbroken points recovered from ceremonially prepared hearths exhibit virtually no use at all (figure 6.4). In the later EIP village context, flake tool assemblages replace bifaces and appear to be produced on-site more often than before; the amount of cortex remaining on debitage flakes (see Gero 1983a) provides a crude

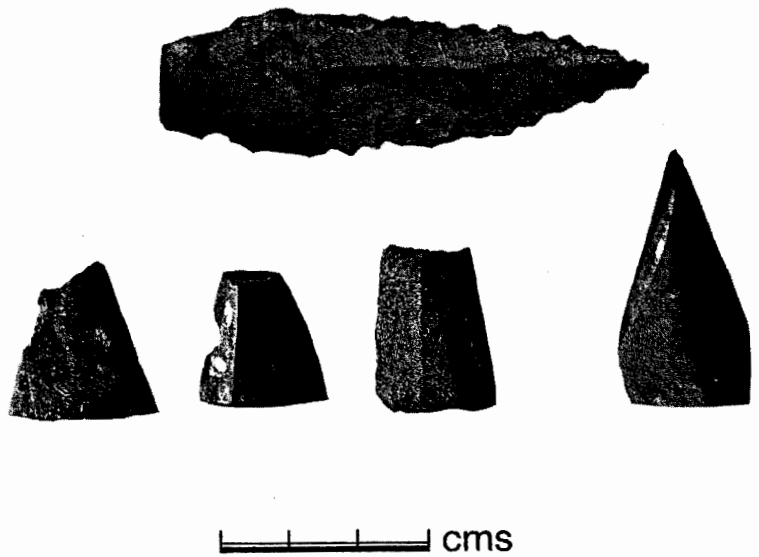

Figure 6.4 Projectile points recovered from ceremonial contexts of Huaricoto.

measure of river cobble material that was worked (or reworked) at the site rather than at the river or quarry location. The fact that, after the unrepresentative preceramic sample, proportions of debitage with cortex rise steadily and reach a full 25% of all debitage in the EIP, suggests that more tools are being produced, or reworked, on site than earlier, a finding that fits comfortably with the EIP rise in frequency of expedient tools and with the replacement of the ceremonial area with a village economy.

Gender shifts in tool production and use at Huaricoto

To recapitulate, the major trends that accompany the shift from ceremonial center to village settlement include: (1) a consistent pairing of flake tools with local raw materials, while bifaces are made of less accessible materials; (2) both bifacially prepared tools and flake tools of the later EIP occupation manifest less retouch and more cortex on tool surfaces (less tool preparation) than in earlier periods; and (3) a dramatic increase in flake tools (and the virtual disappearance of bifaces), together with the homogenization of local raw materials, characterizes the EIP village (non-temple) phase. How are gender systems operating to produce these data?

It is questionable whether the lower proportions of bifacial tools in later phases is because the preceramic, Initial period and Early Horizon economies were so much more intensely focused on hunting or even on meat-eating. In fact, camelid domestication most likely dates to the late EH, and meat preparation and consumption would probably have increased in the EIP (Burke 1990). The change in the ratio of lithic forms and raw materials follows more closely from the shift from a ceremonial to a residential context. We recognize that the carefully finished biface of exotic material in the restricted context of the ceremonial center is *equivalent* to the flake tool in the residential setting, and the flake tool performs many of the same actions unceremoniously that bifaces perform in a ritualistic setting: cutting, scraping, sawing, skinning, and whittling (Ahler 1970: 88–98). Bifaces recovered from restricted, sacred contexts may have been constrained by more formal, standardized morphological definitions and by the value of exotic raw materials from which they were made, to contribute to the legitimation of a restricted and sacred context: the Huaricoto preceramic and Initial period temple.

The high proportions of expended projectile points from the early ritual contexts at Huaricoto probably refer to meat consumption (or offerings) at ceremonial feasts; there is ample evidence for meat preparation in Huaricoto's ritually prepared, ash-filled hearths that are full of splintered bone and tiny flake spalls. At the same time, the

examples of dedicatory and apparently unutilized (or underutilized) projectile points recovered from ceremonial hearths in the early Huaricoto temple suggest that the projectile point was also offered up, in addition to or as a substitute for ceremonial meat. In the earlier occupations at Huaricoto, we can speculate that we are observing rituals in which meat played an important role, with males possibly providing this highly valued food, and probably actually hunting it, in an economy that lacked domesticated animals until late in the Early Horizon.

It may be, too, that men manufactured the Huaricoto bifaces recovered from the early ceremonial and dedicatory contexts; the narrowly restricted conditions that associate men with the production of projectile points (e.g. when such tools carry the social meanings of, and reflect directly on the prestige of hunting and meat production) could apply in this circumstance. Women, however, are likely to be directly associated with the use of these tools in the Huaricoto temple context and most probably participated in the rituals in the preparing, cooking, and serving of the ceremonially important meat.

It also can be seen that the conditions suggesting women's participation in stone tool production and use increase with time, especially in conjunction with the appearance of a residential settlement at Huaricoto after the Early Horizon. When flake tools replace bifaces and become more expedient in their production, and when local raw materials increase in representation, it is not necessarily because a new economic base is creating new uses for stone tools. Rather, the demands on stone tools as sacred and prestigious have changed with the cessation of the temple complex, and social meanings attached to ritual hunting paraphernalia have shifted.

In the village context, stone tools fulfill a much broader range of functions than in the temple area, with less focus specifically on meat preparation and less social loading on tool morphology. Conditions are created that concentrate women's secular work in household production and management, and in the process, encourage the making and using of expedient flake tools produced from abundant local raw materials. The precise activities carried out at Huaricoto by EIP women using flake tools is still not well defined; the quality of locally available lithic materials precludes fine-grained microwear analysis and we are left with gross functional interpretations: working wood, defleshing cactus, butchering and skinning animals, perhaps leather work. In general, the flake tools show little tendency toward task specialization, and the same tool proves to have been used in a wide variety of work actions (Gero 1983a: 152–61).

While males may also be making and using flake tools, male status is no longer linked to lithic production but is tied up in newly defined

prestige goods in other media, some of which are probably commissioned (e.g. the elaborated Recuay ceramics of the EIP (Gero 1990)) and/or made by women (e.g. fancy textiles). Males are increasingly involved in activities that accompany early state formation and that take males into wider socio-political spheres but whose definition lies outside the bounds of this inquiry.

Our understandings of gender relations as they operated in Huaricoto tool production are still very incomplete, and indeed, the question "Did women make stone tools?", although it can now be answered affirmatively, will hardly produce compelling insights into how gender systems operated in Formative Peru. To understand the constitution and operation of gender systems, a focus on a single material technology such as lithics is not necessarily fruitful, and to a great extent the argument presented here is constrained by an archaeological paradigm that would, at least implicitly, assume a simple correspondence between one productive process and one sex. To elucidate gender systems and relations, we will need to trace the convergence of many lines of material evidence. But we have had to put such interests on hold until gender is accepted as a constitutive element of all social relations and as a primary means of signifying relationships of power (Scott 1986). As a new axis of investigation, gender is only beginning to accumulate the analytic power to address (and change) existing archaeological categories, to shift our specialized focus from stones, shells, or sherds to men and women.

ACKNOWLEDGMENTS

Many thanks to the participants of "The Wedge" conference for their wise and supportive comments on this work, and to Meg Conkey for her careful, insightful critique that got to the heart of alternative structures. Liz Brumfiel kindly supplied the epigram. John Clark, Alice Kehoe, and Morgan Maclachlan offered thoughtful comments along the way, and Kathy Bolen contributed diligent research, all of which I very much appreciate and much (but not all) of which I used.

NOTES

1 In contrast to the 100% sample of males in flint knapping research, the ratio of women to men involved in microwear studies appears to be approximately 1:1, compared to an overall ratio of 1:5 women to men employed as full-time archaeologists in anthropology departments listed in the *AAA Guide* (Kramer and Stark 1988: 11).

2 Note that the associational chains that build up and give value to tools as standardized, curated, and elaborately retouched, also include tools of "exotic" (vs. "common") materials, all associated with male production and use. Note how different these values sound when "exotic" materials are called "low density" materials and "common" materials are "high density". In whose terms do we rationalize the high- and low-value terms placed on stone tool dichotomies?

3 Research on the lithic materials of Huaricoto was carried out from 1978 to 1980 with the generous help of a Fulbright-Hays pre-dissertation award, administered by the Comisión para Intercambio Educativo entro los Estados Unidos y el Perú. A 1982 Sigma Xi Grant-in-Aid supported the computerization of the flake tool data. The assemblages considered here are restricted to lithics collected in 1978 and 1979 and owe much to the generous cooperation of Dr Richard Burger, Lucy Salazar-Burger, and Abelardo Sandoval, project directors.

REFERENCES

Adams, Jenny L. (1988). "Use-Wear Analysis on Manos and Hide Processing Stones." *Journal of Field Archaeology* 15: 307–15.

Ahler, Stan (1970). *Projectile Point Form and Function at Rodgers Shelter, Missouri.* Missouri Archaeological Society Research Series No. 8.

Arundale, Wendy H. (1980). "Functional Analysis of Three Unusual Assemblages from the Cape Dorset Area, Baffin Island." *Arctic* 33: 464–86.

Bienenfeld, Paula (1985). Preliminary Results from a Lithic Use-Wear Study of the Swifterbant Sites, S-51, S-4, and S-2. *Helinium* 25: 194–211.

Binford, Lewis R. and S. Binford (1966). A Preliminary Analysis of Functional Variability in the Mousterian of Levallois Facies. *American Anthropologist* 68: 238–95.

Bonnichsen, Robson (1977). *Models for Deriving Cultural Information from Stone Tools.* Ottowa: Mercury Series Paper No. 60, National Museum of Man.

Bordes, Francois (1968). *The Old Stone Age.* New York: World University Library.

Boulding, Elise (1978). "Women, Peripheries and Food Production." Consortium for International Development, "International Conference on Women and Food," January 8–11, 1978. Vol. I, Tucson: University of Arizona, 22–44.

Bradley, B. A. (1975). "Lithic Reduction Sequences: A Glossary and Discussion." In *Lithic Technology: Making and Using Stone Tools*, E. Swanson, ed. The Hague: Mouton, 5–13.

Brown, Judith (1970). "A Note on the Division of Labor by Sex." *American Anthropologist* 72: 1073–8.

Bryan, A. L. (1960). "Pressure Flaking: The Problem of Identification." *Tebiwa* 3: 29–30.

Burger, Richard L. and Frank Asaro (1977). "Analisis de rasgos significativos en

la obsidiana de los Andes Centrales." *Revista del Museo Nacional* (Lima) 43: 281–325.

Burger, Richard L. and Lucy Salazar-Burger (1980). "Ritual and Religion at Huaricoto." *Archaeology* 33: 26–32.

—— (1985). "The Early Ceremonial Center of Huaricoto." In *Early Ceremonial Architecture in the Andes*, Christopher Donnan, ed. Washington: Dumbarton Oaks Research Library and Collection, 111–38.

Burke, Robin (1990). "The Llama Figurine in Andean Prehistory: Analysis of Examples from the Callejón de Huaylas, Peru." Unpublished MA Thesis, Department of Anthropology, University of South Carolina.

Butler, William B. (1980). "Penetrating Elephant Hide with Wood Atlatl Darts." *Plains Anthropologist* 25: 353–6.

Callahan, Eric (1979). "The Basics of Biface Knapping in the Eastern Fluted Point Tradition: A Manual for Flintknappers and Lithic Analysts." *Archaeology of Eastern North America* 7.

Cantwell, Anne-Marie (1979). "The Functional Analysis of Scrapers: Problems, New Techniques and Cautions." *Lithic Technology* 8: 5–11.

Clark, John E. (1982). "Manufacture of Mesoamerican Prismatic Blades: An Alternative Technique." *American Antiquity* 47: 355–76.

Coutts, P. J. F. (1977). "Green Timber and Polynesian Adzes and Axes." In *Stone Tools as Cultural Markers*, R. V. S. Wright, ed. Canberra: Australian Institute of Aboriginal Studies, 67–82.

Coward, Rosalind (1983). *Patriarchal Precedents*. London: Routledge & Kegan Paul.

Crabtree, Don E. (1967). Notes on Experiments in Flintknapping: Tools Used for Making Flaked Stone Artifacts. *Tebiwa* 10: 60–73.

—— (1972). *An Introduction to Flintworking*. Boise: Idaho State University Museum Occasional Papers 28.

Elliott, W. J. and R. Anderson (1974). "A Butchering Experiment with Flaked Obsidian Tools." *Archaeology in Montana* 15: 1–10.

Estioko-Griffin, Agnes and P. Bion Griffin (1981). "Woman the Hunter: The Agta." In *Woman the Gatherer*, Frances Dahlberg, ed. New Haven: Yale University Press, 121–51.

Fausto-Sterling, Anne (1985). *Myths of Gender*. New York: Basic Books.

Fischer, Anders, P. V. Hansen, and P. Rasmussen (1984). "Macro and Micro Wear Traces on Lithic Projectile Points." *Journal of Danish Archaeology* 3: 19–46.

Flenniken, J. Jeffrey (1981). *Replicative Systems Analysis: A Model Applied to the Vein Quartz Artifacts from the Hoko River Site*. Washington State University Laboratory, Anthropology Report No. 59.

—— (1984). "The Past, Present and Future of Flintknapping: An Anthropological Perspective." *Annual Review of Anthropology* 13: 187–203.

Flenniken, J. Jeffrey and Anan Raymond (1986). "Morphological Projectile Point Typology: Replication Experimentation and Technological Analysis." *American Antiquity* 51: 603–14.

Frison, George C. (1989). "Experimental Use of Clovis Weaponry and Tools on African Elephants." *American Antiquity* 54: 766–84.

Gailey, Christine Ward (1987). *Kinship to Kingship: Gender Hierarchy and State Formation in the Tongan Islands*. Austin: University of Texas Press.

Geis, Maureen (1987). "Lithic Flake Production Analysis: Another Fly in the Ointment." Paper presented at the 15th Annual Meeting of the Northeast Anthropological Association, Amherst, MA.

Gero, Joan M. (1983a). "Material Culture and the Reproduction of Social Complexity: A Lithic Example from the Peruvian Formative." Unpublished Ph.D. dissertation, Department of Anthropology, University of Massachusetts.

—— (1983b). "Stone Tools in Ceramic Contexts: Exploring the Unstructured." In *Investigations of the Andean Past*, D. Sandweiss, ed. Ithaca: Cornell University Latin American Studies Program, 38–50.

—— (1989). "Stylistic Information in Stone Tools: How Well do Lithics Measure Up?" In *Time, Energy and Stone Tools*, Robin Torrence, ed. Cambridge: Cambridge University Press, 92–105.

—— (1990). "Pottery, Power and Parties! at Queyash, Peru." *Archaeology*, March/April: 52–6.

—— (forthcoming). "Facts and Values in the Archaeological Eye." In *The Powers of Observation*, S. Nelson and A. Kehoe, eds. American Anthropological Association Publication No. 2.

Goodale, Jane C. (1971). *Tiwi Wives*. Seattle: University of Washington Press.

Gould, Richard A. (1977). "Ethno-archaeology; Or, Where do Models Come From?" In *Stone Tools as Cultural Markers*, R. V. S. Wright, ed. Canberra: Australian Institute of Aboriginal Studies, 162–77.

Hamilton, Annette (1980). "Dual Social Systems: Technology, Labour and Women's Secret Rites in the Eastern Western Desert of Australian." *Oceania* 51: 4–19.

Hayden, Brian (1977). Stone Tool Functions in the Western Desert." In *Stone Tools as Cultural Markers*, R. V. S. Wright, ed. Canberra: Australian Institute of Aboriginal Studies, 178–88.

Hester, Thomas R. and Robert F. Heizer (1973). *Bibliography of Archaeology I: Experiments, Lithic Technology, and Petrography*. Reading, Massachusetts: Addison-Wesley Module in Anthropology No. 29.

Hester, T., L. Spencer, C. Busby, and J. Bard (1976). "Butchering a Deer with Obsidian Tools." *University of California Archaeological Research Facility Contributions* 43: 33–75.

Holmes, W. H. (1897). "Stone implements of the Potomac–Chesapeake Tidewater Province." In *15th Annual Report of the Bureau of Ethnology*, J. W. Powell, ed. Washington; Government Printing Office, 13–152.

—— (1919). *Handbook of Aboriginal American Antiquities: Part I. The Lithic Industries*. Washington: Bureau of American Ethnology, Bulletin 60.

Huckell, Bruce (1982). "The Denver Elephant Project: A Report on Experimentation with Thrusting Spears." *Plains Anthropologist* 27: 217–24.

Jesuit Relations and Allied Documents: Travels and Explorations of the Jesuit Missionaries in New France, 1610–1791, Father Pierre Biard, *Relations of New France, of its Lands, Nature of the Country and of its Inhabitants* Vol. III: Acadia, 1611–1616.

Juel Jensen, Helle (1982). "A Preliminary Analysis of Blade Scrapers from

Ringkloster, a Danish Late Mesolithic Site." *Studia Praehistorica Belgica* 2: 323–7.
—— (1988). "Functional Analysis of Prehistoric Flint Tools by High-Power Microscopy: A Review of West European Research." *Journal of World Prehistory* 2: 53–88.
Johnson, Lucy Lewis (1977). "A Technological Analysis of an Aguas Verdes Quarry-Workshop. "In *The Individual in Prehistory: Studies of Variability in Style in Prehistoric Technologies*, J. N. Hill and J. Gunn, eds. New York: Academic Press, 205–29.
—— (1978). "A History of Flint-knapping Experimentation, 1838–1976." *Current Anthropology* 19: 337–72.
Jones, Rhys and Neville White (1988). "Point Blank: Stone Tool Manufacture at the Ngilipitji Quarry, Arnhem Land, 1981." In *Archaeology with Ethnography: An Australian Perspective*, Betty Meehan and Rhys Jones, eds. Canberra: Australian National University, 51–87.
Kehoe, Alice (1987). "Points and Lines." Paper presented at the Annual Meeting of AAA, Chicago.
Kelterborn, Peter (1984). "Towards Replicating Egyptian Predynastic Flint Knives." *Journal of Archaeological Science* 11: 433–53.
Knudson, Ruthann (1973). "Organizational Variability in Late Paleo-Indian Assemblages." Unpublished Ph.D. dissertation, Washington State University.
—— (1979). "Inference and Imposition in Lithic Analysis." In *Lithic Use-Wear Analysis*, B. Hayden, ed. New York: Academic Press, 269–81.
Korobkova, G. F. (1981). "Ancient Reaping Tools and Their Productivity in the Light of Experimental Tracewear Analysis." In *The Bronze Age Civilizations of Central Asia*, Philip L. Kohl, ed. Armonk, NY: M. E. Sharpe, 325–49.
Kramer, Carol and Miriam Stark (1988). "The Status of Women in Archaeology." *Anthropology Newsletter*, (American Anthropological Association) 29(9): 1, 11–12.
Leudtke, Barbara (1979). "The Identification of Sources of Chert Artifacts." *American Antiquity* 44: 744–57.
Laughlin, William (1968). "Hunting: An Integrative Biobehavior System and its Evolutionary Importance." In *Man the Hunter*, Richard Lee and Irven deVore, eds. Chicago: Aldine, 304–20.
Lewenstein, Suzanne (1981). "Mesoamerican Obsidian Blades: An Experimental Approach to Functions." *Journal of Field Archaeology* 8: 175–88.
—— (1987). *Stone Tool Use at Cerros: The Ethnoarchaeological and Use-Wear Evidence*. Austin: University of Texas Press.
Lowe, Marian (1983). "The Dialectic of Biology and Culture." In *Woman's Nature: Rationalizations of Inequality*, Marian Lowe and Ruth Hubbard, eds. New York: Pergamon, 39–62.
Madsen, Bo (1984). "Flint Axe Manufacture in the Neolithic: Experiments with Grinding and Polishing of Thin-Butted Flint Axes." *Journal of Danish Archaeology* 3: 47–62.
Mansure-Franchomme, Maria Estela (1983). "Scanning Electron Microscopy of Dry Hide Working Tools: The Role of Abrasives and Humidity in Microwear Polish Formation." *Journal of Archaeological Science* 10: 223–30.

Miller, Tom O., Jr (1979). "Stonework of the Xetá Indians of Brazil." In *Lithic Use-Wear Analysis*, Brian Hayden, ed. New York: Academic Press, 401–7.
Montet-White, Anta (1974). "The Significance of Variability in Archaic Point Assemblages." *Plains Anthropologist* 19: 14–24.
Moore, Henrietta (1988). *Feminism and Anthropology*. Cambridge: Polity Press.
Moss, Emily (1983). *The Functional Analysis of Flint Implements. Pincevent and Pont d'Ambon: Two Case Studies from the French Final Paleolithic*. Oxford: BAR International Series No. 177.
—— (1986). "What Microwear Analysts Look At." In Owen, L. and G. Unrath, ed. "Technological Aspects of Microwear Studies." *Early Man News* (Tübingen) 9–11: 91–6.
Neill, Wilfred T. (1952). "The Manufacture of Fluted Points." *The Florida Anthropologist* V(1–2): 9–16.
Newcomer, Mark H. (1971). "Quantitative Experiments in Handaxe Manufacture." *World Archaeology* 3(1): 85–93.
Odell, George H. (1980). "Butchering with Stone Tools: Some Experimental Results." *Lithic Technology* 9: 39–48.
Odell, George H. and F. Cowan (1986). "Experiments with Spears and Arrows on Animal Targets." *Journal of Field Archaeology* 13: 195–212.
Olausson, Deborah Seitzer (1980). "Starting from Scratch: The History of Edge-Wear Research from 1838–1978." *Lithic Technology* 9: 48–60.
Park, Edwards (1978). "The Ginsberg Caper: Hacking it as in Stone Age." *Smithsonian* 9: 85–94.
Price-Beggerly, Patricia (1976). "Edge Damage on Experimentally Used Scrapers of Hawaiian Basalt." *Lithic Technology* 5: 22–4.
Purdy, Barbara A. (1975). "Fractures for the Archaeologist." In *Lithic Technology: Making and Using Stone Tools*. Earl Swanson, ed. Chicago: Aldine.
—— (1981). *Florida's Prehistoric Stone Technology*. Gainesville: University Presses of Florida.
Rippeteau, Bruce (1979). "The Denver Elephant Project: A Personal and Semi-Preliminary Report." In *Megafauna Punchers' Review*, vol. 1, B. Rippeteau, ed. Denver: Office of the Colorado State Archaeologist, 1–8.
Sale, Irene Levi (1986). "Use Wear and Post Depositional Surface Modification: A Word of Caution." *Journal of Archaeological Science* 13: 229–44.
Schneider, Mary Jane (1983). "Women's Work: An Examination of Women's Roles in Plain Indian Arts and Crafts." In *The Hidden Half: Studies of Plains Indian Women*, P. Albers and B. Medicine, eds. Lanham, MD: University Press of America, 101–21.
Scott, Joan W. (1986). "Gender: A Useful Category of Historical Analysis." *American Historical Review* 91: 1053–75.
Sheets, Payson D. and Guy Muto (1972). "Pressure Blades and Total Cutting Edge: An Experiment in Lithic Technology." *Science* 175: 632–4.
Sollberger, J. B. (1969). "The Basic Tool Kit Required to Make and Notch Arrow Shafts for Stone Points." *Texas Archaeological Society Bulletin* 40: 232–40.
Spears, Carol S. (1975). "Hammers, Nuts and Jolts, Cobbles, Cobbles, Cobbles: Experiments in Cobble Technologies in Search of Correlates." In *Arkansas*

Eastman Archaeological Project, C. Baker, with contributions by C. Spears, C. Claassen and M. Schiffer. Fayetteville: Arkansas Archaeological Survey, 83–110.

Spencer, L. (1974). "Replicative Experiments in the Manufacture and Use of a Great Basin Atlatl." In *Great Basin Atlatl Studies*, T. R. Hester, M. P. Mildner, and L. Spencer, eds. Ramona, CA: Ballena Press Publications in Archaeology, Ethnology and History No 2, 37–60.

Spencer, W. B. and F. J. Gillen (1912). *Across Australia*. London: Macmillan.

Stafford, Barbara D. (1977). "Burin Manufacture and Utilization: An Experimental Study." *Journal of Field Archaeology* 4: 235–46.

Stanford, Dennis (1979). "Carving up a 'Mammoth' Stone Age Style." *National Geographic* 155: 121.

Thomas, David H. (1983). *Gatecliff Shelter*. New York: Anthropological Papers of the American Museum of Natural History 59, part 1.

Tindale, N. B. (1972). "The Pitjandjara." In *Hunters and Gatherers Today*, M. G. Bicchieri, ed. New York: Holt, Rinehart & Winston, 217–68.

Titmus, Gene L. (1984). "Some Aspects of Stone Tool Notching." In *Stone Tool Analysis: Essays in Honor of Don Crabtree*, J. Woods, M. G. Plew, and M. G. Pavesic, eds. Albuquerque: University of New Mexico Press, 243–63.

Torrence, Robin (1983). "Time Budgeting and Hunter-Gatherer Technology." In *Hunter-Gatherer Economy in Prehistory: A European Perspective*, G. Bailey, ed. Cambridge: Cambridge University Press, 11–22.

—— (1989) (ed.) *Time, Energy and Stone Tools*. Cambridge: Cambridge University Press.

Tringham, Ruth, Glenn Cooper, George Odell, Barbara Voytek, and Anne Whitman (1974). "Experimentation in the Formation of Edge Damage: A New Approach to Lithic Analysis." *Journal of Field Archaeology* 1: 171–95.

Tsirk, Are (1974). "Mechanical Basis of Percussion Flaking: Some Comments." *American Antiquity* 39: 128–30.

Unger-Hamilton, Romana (1984). "The Formation of Use-Wear Polish on Flint: Beyond the 'Deposit vs. Abrasion' Controversy." *Journal of Archaeological Science* 11: 91–8.

White, J. Peter (1967). "Ethno-archaeology in New Guinea: Two Examples." *Mankind* 6(9): 409–14.

—— (1969). "Typologies for Some Prehistoric Flaked Stone Artifacts of the Australian New Guinea Highlands." *Archaeology and Physical Anthropology of Oceania* 4(1): 18–46.

—— (1977). *Axes and Aré: Stone Tools of the Duna*. Forty-one minute documentary film.

Witthoft, John (1967). "The Art of Flint Chipping." *Journal of the Archaeological Society of Maryland* 3: 123–44.

Wilson, John, L. Reyes, and J. Garayar (1967). *Geología de los Cuadrangulos de Mollebamba, Tayabamba, Huaylas, Pomabamba, Carhuaz y Huari*. Lima: Servicio de Geología Minería, Boletín 16.

Wilson, Thomas (1899). "Arrowpoints, Spearheads, and Knives of Prehistoric Times." Report of the U.S. National Museum 1897, Part 1, 811–988.

Young, David and Robson Bonnichsen (1984). *Understanding Stone Tools*. Orono: University of Maine, Peopling of the American Process Series No. 1.