

The Special Relationship Between Men and Metallurgy: A Discussion on Gender-Based Assumptions During Craft Production Using Archaeological and Ethnographic Examples

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Introduction

There is an underlying assumption in several dated studies that there is a special link between men and metallurgy, and that furthermore this link may exist alongside a presumed association between women and pottery. The gendered assumption of such a link between men and metallurgy is the sum of several pre-existing assumptions. The most influential of these is the argument that early smiths were dedicated, full time, exclusively male specialists who increasingly disassociated themselves from other specialised roles in religion, ritual, or politics.¹ This central argument anchors foundational assumptions regarding the special nature of metal technology. The most influential supposition promotes metal technology as fundamentally more complex than other supposedly unscientific technologies, while perpetuating an assumption about the constancy of gender roles.²

Using chronological definitions of metallurgy, Budd and Taylor demonstrate how the promotion of metalworking over the last century has stripped the sociocultural aspects down to pure science.³ Linked to this paradigm shift is the

¹ Paul Budd and Tim Taylor, 'The Faerie Smith Meets the Bronze Industry: Magic versus Science in the Interpretation of Pre-Historic Metal-Making', *World Archaeology*, 27 (1995), 133-143 (p. 133).

² Budd and Taylor, p. 133.

³ Budd and Taylor, p. 134.

‘intradisciplinary divide between archaeological scientists and sociocultural archaeologists and anthropologists’.⁴ It is difficult to envisage a comprehensive interdisciplinary account of human history when such an intradisciplinary divide still persists. The aim of this paper is to suggest ways in which archaeologists can attempt to shrink the size of this divide. The objectives are: to assist archaeologists in identifying the sources of the specific aforementioned assumptions; to encourage archaeologists to consider the ways in which these assumptions and any resulting theories, conclusions, or further assumptions manifest themselves in past and present literature; and finally to highlight alternative approaches.

Origins of the Assumption

Earlier work within the discipline heavily influenced the intra-disciplinary divide and assumptions made when discussing gender roles in craft production, perhaps none more so than the Marxist-Leninism of Gordon Childe. In Childe’s essay, ‘Archaeological Ages as Technological Stages’, he expressed his dismay with the traditional sub-divisions of the Bronze and Iron Ages refined by Christian Jürgensen Thomsen.⁵ Childe proposed a new sequence of developments with gendered metallurgical technology at its core, as part of an on-going discourse with his contemporaries G.E. Daniel and T.A. Rickard. This work set the stage for the enduring influence it would have on generations of archaeo-metallurgists.⁶ This

⁴ Ibid.

⁵ Vere Gordon Childe, ‘Archaeological Ages as Technological Stages’, *Journal of the Royal Anthropological Institute of Great Britain and Ireland*, 74 (1944), 7-24.

⁶ Theodore A. Wertime, ‘Man’s First Encounters with Metallurgy’, *Science*, 146 (1964), 1252-1267; Theodore A. Wertime, ‘The Beginnings of Metallurgy: A New Look’, *Science*, 182 (1973), 875-887; Tamara S. Wheeler and Robert Maddin, ‘Metallurgy and Ancient Man’, in *The Coming of the Age of Iron*, ed. by Theodore A. Wertime and James D. Muhly (New Haven: Yale University Press, 1980), pp. 99-126; and James A. Charles, ‘Determinative Mineralogy and the Origins of Metallurgy’, in *Furnaces and Smelting Technology in Antiquity*, ed. by Paul T. Craddock and M.J. Hughes (London: British Museum, 1985).

influence persisted contra significant discoveries in material culture since Childe and related shifts in the understanding and conceptualisation of pre-historic society and technology.

Childe is not alone in perpetuating gender-based assumptions. Wright cites the deeply rooted gender bias pervasive in the ethnographies utilised by archaeology for social reconstruction.⁷ While the ethnographies discussed by Wright are not representative of all ethnography, it is clear that many perpetuate assumptions based on gender.⁸ Many associate labour extensive activities and low yields exclusively with women and innovating, labour intensive activities exclusively with men.⁹ The authors of these ethnographies did not create the assumptions, but continue to perpetuate stereotypes dating to the eighteenth and nineteenth century ideology of separate spheres. This ideology is the defining creational force behind the development of social science and our conceptualisation of non-Western societies. This is a position that is supported by the work of other scholars, notably Wright's survey of fourteen propositions found in scholarly literature which discuss the roots of patriarchy.¹⁰ Wright's position is shared by Vincentelli and Ehrenberg, and the latter discusses ways in which the polarised gender divisions forged by a scholarship formed

⁷ Rita P. Wright, 'Women's Labor and Pottery Production in Prehistory', in *Engendering Archaeology: Women and Prehistory*, ed. by Joan M. Gero and Margaret W. Conkey (Oxford: Basil Blackwell, 1991), pp. 194-223.

⁸ Eugenia W. Herbert, *Iron, Gender, and Power: Rituals of Transformation in African Societies* (Bloomington: Indiana University Press, 1993) and Peter R. Schmidt, 'Reconfiguring the Barongo: Reproductive Symbolism and Reproduction Among a Work Association of Iron Smelters', in *The Culture and Technology of African Iron Production*, ed. by Peter R. Schmidt (Gainesville, FL: University Press of Florida, 1996), pp. 74-127.

⁹ Robert Briffault, *The Mothers: A Study of the Origins of Sentiments and Institutions*, Vol. I. ([S.I.]: Allen and Unwin, 1927); Eliot Dismore Chapple and Carleton Steven Coon, *Principles of Anthropology* (New York: Henry Holt, 1942); and John Otis Brew, 'The Metal Ages: Copper, Bronze, and Iron', in *Man, Culture, and Society*, ed. by Harry Lionel Shapiro (New York: Oxford University Press, 1956), pp. 111-138.

¹⁰ Rita P. Wright, 'Women and the Emergence of Urban Society in Mesopotamia', in *Archaeology and Women: Ancient and Modern Issues*, ed. by Sue Hamilton and Ruth D. Whitehouse (Walnut Creek, CA: Left Coast Press, 2007), pp. 199-239.

primarily of privileged elitist men in the late nineteenth century influenced early twentieth century authors.¹¹

Modern literature suggests that the shift towards the subordination of women associated with the transition from pre-state to state-level societies planted the seed of patriarchy and biased ideology.¹² Rice indicates that the ethno-centrism and emphasis on specialisation found in discussions on the relationship between home production and workshop production during this transition skews the topic towards males.¹³ Cockburn argues that supremacy in a constant, dynamic battle for ownership as well as control of disposable surpluses and technological skills have been the two paramount priorities during this shift to male-dominated, class-structured societies. Technological skills, the intangible ‘software’ element of technology, were defined as male property and therefore both a cause and an effect of male supremacy.¹⁴

Although the pre-state to state-level society debate continues, the work cited appears to provide a consensus. The division of labour and organisation of production is culturally negotiated by kinship in non-state societies. The transition to state-level societies involves the restructuring of kinship relations, concomitant labour divisions, and production organisation to which gender is central. It is reasonable to suggest that both points above work in tandem to create and perpetuate gender-based assumptions. The gender divisions that occur are connected to dynamic shifts in the structure of

¹¹ Moira Vincentelli, *Women and Ceramics: Gendered Vessels* (Manchester: Manchester University Press, 2000) and Margaret Ehrenberg, *Women in Prehistory* (London: BMP, 1989).

¹² Christine W. Gailey, *Kinship to Kingship. Gender Hierarchy and State Formation in the Tongan Islands* (Austin, TX: University of Texas Press, 1987); Prudence M. Rice, ‘Women and Prehistoric Pottery Production’, in *The Archaeology of Gender*, ed. by Dale Walde and Noreen D. Willows (Calgary: University of Calgary, 1991), pp. 436-443; and Wright 2001, 2007.

¹³ Rice, pp. 436-443.

¹⁴ Cynthia Cockburn, ‘Technology, Production, and Power’, in *Inventing Women: Science, Technology, and Gender*, ed. by Gill Kirkup and Laurie Smith Keller (Cambridge: Polity in association with the Open University, 1992), 196-211 and Sarah B. McClure, ‘Gender, Technology, and Evolution: Cultural Inheritance Theory and Prehistoric Potters in Valencia, Spain’ *American Antiquity*, 72. 3 (2007), 485-508.

societal operations. Frequently, these divisions occur in agreement with assumptions based on gender stereotyping but are far from universal. Yet these are contrasted with (mostly male) scholars who sometimes create gender divisions where there are none, and infuse their work with biased, stereotypical assumptions. These assumptions range from the innocent mistake to the not-so-innocent misinterpretation, as highlighted by Taylor:

‘[A] short-sword was uncovered in the course of excavating a skeleton; however, as soon as it was discovered that the skeleton was female, the object became a weaving baton and has remained so ever since.’¹⁵

Assumption Manifestation: Past and Present

The prevailing presentation of gender-based assumptions is an anthropocentric one, most often advocating the rational, logical, and intentional scientific experimentation with metal resources by early smiths.¹⁶ Presented as apparent and inexorable, the development of metallurgy promotes the smith who ‘might be regarded as the earliest scientist experimenting on the basis of that innate curiosity which is part of the human character.’¹⁷ Several authors take the ideas of Childe to task and untangle Wertime’s web.¹⁸ What is crucial to understand is that both Childe and Wertime presented several key elements, including: promoting innate deductive reasoning, logic, and intent over accidental trial and error; the central role that metallurgy played in facilitating other crafts or activities; man’s control over nature; standardisation and specialisation of tools; industrial use of metals subjugating all

¹⁵ Tim Taylor, *The Prehistory of Sex* (London: Fourth Estate, 1997), p. 36.

¹⁶ Childe, 1944 and Wertime 1964, 1973.

¹⁷ Charles, p. 26.

¹⁸ Budd and Taylor (1995) and Paul Budd, B. Scaife, Tim Taylor, and R.G. Thomas, ‘Untangling the Web: Some New Views on the Origins of Prehistoric Metallurgy’, *Historical Metallurgical Society*, 28. 2 (1994), 99-104.

other uses; and their insistence on biological terminology. Unlike Wertime, Muhly did not appreciate the ideas put forth by Childe, particularly his relegation of the critical first stages of metallurgy to 'Mode 0', thus implying insignificance. Muhly employs the Neolithic site of Çayönü Tepesi in southeastern Turkey as a case study to demonstrate a learned, cumulative process rather than the two extremes of an innate 'technical logic' or 'mere happenstance'.¹⁹

In summarising Childe's argument, Budd and Taylor demonstrate the problematic nature of Childe's perspective: 'metallurgy was 'science' and technological progress marked the victory of rationality over superstition, of a 'true' understanding of the natural world with its objective, given 'environment' and its material 'resources' over a ritual-soaked 'false consciousness'.'²⁰ Promoting metallurgy as a science above all other 'less complex crafts', Childe inferred the need for full-time, dedicated specialists and subsequent large-scale social reorganisation. Central to this reorganisation is the renegotiation of gender roles as the 'casting of bronze is too difficult a process to be carried out by anyone in the intervals of growing or catching food or minding her babies. It is a specialist's job.'²¹ Knauth claimed a similar sentiment forty years later: 'the transmission of lore need not differ in kind from that of potters' lore. But the smith's task was more complicated and exacting than hers, the knowledge he required more specialised.'²²

Modern critics take issue with gendered language or grammar, the characterisation or value ascribed to activities performed by women, and the entire

¹⁹ James D. Muhly, 'The Beginnings of Metallurgy in the Old World', in *The Beginnings of the Use of Metals and Alloys*, ed. by Robert Maddin (London: The MIT Press, 1988), pp. 2-20 (p. 5).

²⁰ Budd and Taylor (1995), p. 135.

²¹ Vere Gordon Childe, *Man Makes Himself* (London: Watts and Co., 1936), p. 9.

²² Percy Knauth, *The Metalsmiths* (New York: Time-Life Books, 1974), p. 138.

concept of gender.²³ The first is shown through the contributions of men highlighted and written in the active tense, whereas those of women are minimised and written in the passive tense; a practice that survives alongside the gendered pronoun.²⁴ In the second, Moira summarises that female craft production is consistently characterised and valued in a negative way as ‘lacking’, ‘primitive’, and ‘low tech’.²⁵ Even ceramics are most often associated with little skill and with rudimentary kilns or bonfires in which the temperatures reach minimally controllable, modest temperatures. It is commonplace for collectors or publishers to ignore ‘largely domestic and anonymous’ ceramics produced by women because they lack in value. Finally, gender (as defined by western ideology) is often automatically ascribed in a substantial amount of research, particularly ethnography and ethno-archaeology. Several languages do not even have a word or concept that explains sex or gender in a way equivalent to the English language.²⁶

Challenging the Assumptions: Current Research

These early challenges gave rise to the power of women or matriarchy countering the masculine ideology that surged in the nineteenth century.²⁷ Some current studies challenge this ideology by introducing alternative theories, methodologies, and frameworks.²⁸ Others address gender identity directly, discussing

²³ Margaret Conkey and Joan Spector, ‘Archaeology and the Study of Gender’, in *Advances in Archaeological Method and Theory*, ed. by Michael B. Schiffer (New York: Academic Press, 1984), Vol. 7, 1-38 (pp. 10-12).

²⁴ Sally R. Binford and Lewis R. Binford, *New Perspectives in Archaeology* (1968).

²⁵ Vincentelli, p. 14.

²⁶ Rasmi Shoocongdej, ‘Gender Roles Depicted in Rock Art’, in *In Pursuit of Gender: Worldwide Archaeological Approaches*, ed. by Sarah M. Nelson and Myriam Rosen-Ayalon (Walnut Creek, CA: AltaMira Press, 2002), pp. 187-207.

²⁷ Johann Jakob Bachofen, *Das Mütterrecht* (Stuttgart: 1861) and Frederick Engels, 1884. *The Origins of the Family, Private Property, and the State* ed. by Eleanor Leacock (1884, 1972).

²⁸ Marcia-Anne Dobres, ‘Gender and Prehistoric Technology: On the Social Agency of Technical Strategies’, *World Archaeology*, 27. 1 (1995), 25-49; Margaret Nelson, Donna Glowacki, and Annette Smith, ‘The Impact of Women on Household Economies’, in *In Pursuit of Gender*, ed.

the relationship between sexuality and gender or homosexual or homosocial concepts, providing some ground-breaking research, particularly in certain regions or cultures.²⁹

Budd and Taylor support ‘putting the magic back’ into metalworking by throwing out ‘antiquated notions of species’ of metals and artefacts reminiscent of a ‘predetermined picture of standardisation and industrial production’.³⁰ Their suggestion includes re-analysing the material evidence, perhaps via metallographic analyses, to reveal the non-scientific micro-idiosyncrasies of artefacts. Research can then be re-focused so that the magico-religious aspect of performance metallurgy is central, in which the cultural importance was on the process rather than finished product. Magico-religious performances involved colourful, charismatic, and mystical pyrotechnical displays. The performances were essential to the craft and were often used to negotiate the identity of the artisan and his or her relationship with others.³¹ Such performances characterised metallurgy from the Early Bronze Age through to the Early Iron Age, an argument eventually conceded by Wertime and Childe. Although the political and religious roles gradually divorced from metalworking, there exists no reason why this aspect should not receive full consideration.

Of primary relevance, Budd and Taylor also argue for the *de*-construction of Childe’s anachronistic *re*-construction of social organization by ‘uncoupling our chains of assumption to allow each link to come under close scrutiny’ and avoiding biased terminology and the prejudgment of social personas or roles.³² Rye and Evans

Nelson and Rosen-Ayalon, pp. 125-154; and Sarah M. Nelson, *Handbook of Gender in Archaeology* (Lanham, MD. : AltaMira Press, 2006).

²⁹ Rosemary A. Joyce, ‘Male Sexuality Among the Maya’, in *Archaeologies of Sexuality*, by Robert Schmidt (London: Routledge, 2000).

³⁰ Budd and Taylor (1995), p. 138-139.

³¹ Roger C.P. Doonan and Alexander Mazarakis-Ainan, ‘Forging Identity in Early Iron Age Greece: Implications of the Metalworking Evidence From Oropos’, in *Oropos and Euboea in the Early Iron Age* (Volos: University of Thessaly Publications, 2007).

³² Budd and Taylor (1995), p. 139.

conducted research on ‘potters’ in Pakistan whom they identified as men ‘despite their explicit recognition that all but one of the potters is assisted by family members, including women.’³³ If women and children often assisted by performing the ‘peripheral’ activities of pottery production, then it should be conceivable that they also performed the harvesting, crushing, or even smelting and smithing of metal ore, a theory supported by several convincing arguments and ethnographic examples.³⁴

Wright argues that what remains unrecognised are these ‘peripheral’ aspects of both crafts.³⁵ This renders those individuals performing these tasks invisible, in contrast to the ‘potter’ or ‘smith’, thus demonstrating the pervasiveness of not only gender bias, but also western assumptions of individualism and of production and distribution organization. For Wright, a re-analysis of existing ethnographic literature is required to address the interpretations of the participation of women in pottery production that have been biased by ‘contemporary gender ideology and modern models of the workplace.’³⁶ Concomitant with this is the recognition and further study of pottery production, agriculture, and cooking as crafts equal to metallurgy in their complexity.

McClure addresses the problem, raised by Cockburn, of knowledge and skills being the property of men, by supporting approaches incorporating the ‘hardware’ or the tangible elements, and ‘software’ or the intangible knowledge of technology.³⁷ Reid and MacLean assert that ‘the acquisition and possession of iron-working

³³ Owen S. Rye and Clifford Evans, *Traditional Pottery Techniques of Pakistan* (Washington: Smithsonian Contributions to Anthropology, 1976).

³⁴ Ann B. Stahl and Maria das Dores Cruz, ‘Men and Women in a Market Economy: Gender and Craft Production in West Central Ghana c 1775-1995’, in *Gender in African Prehistory*, ed. by Susan Kent (Walnut Creek, CA.: AltaMira Press, 1998); Sarah M. Nelson, *Gender in Archaeology: Analysing Power and Prestige* (Oxford: AltaMira Press, 1997); and Wright (1991).

³⁵ Wright (1991).

³⁶ George P. Murdock and Caterina Provost, ‘Factors in the Division of Labor by Sex: A Cross Cultural Analysis’, *Ethnology*, 12 (1973), 203-225.

³⁷ McClure, pp. 486-487.

knowledge is a source of power.’³⁸ Because women are excluded from that knowledge, they are essentially prevented from obtaining the same level as men.³⁹ Yet the role of women remains unexplored. McClure argues that ‘variability in technological practices can be used to identify modes of transmission for cultural knowledge’, and from this one might be able to extrapolate ideas relating to gender.⁴⁰ This is similar to the work of Dobres, who attempts to discover the link between ‘engendered social relations of production’ and the ‘patterning of technical variability’ in material culture.⁴¹

Sassaman illustrates the society-wide division of labour using an example of how pottery production was introduced within the context of shell fishing, as both activities were performed by women but remained mutually exclusive, seasonal activities.⁴² In her study of the Harappan culture, Wright similarly demonstrates how cooking, particularly bread-making, paralleled advancements in pottery.⁴³ As women performed the majority of farming and gathering, it is likely that they were the inventors and innovators of related objects.⁴⁴ The intentional exclusion of women from gaining most production skills, particularly as crafts became increasingly specialized, meant that women rarely had the skills necessary to bring their innovations to fruition. The current challenges implicate knowledge exclusion as a leading reason for credit being ascribed to men, by men. This supports the argument

³⁸ Andrew Reid and Rachel MacLean, ‘Symbolism and the Social Contexts of Iron Production in Karagwe’, *World Archaeology*, 27. 1 (1995), 144-161 (p.145).

³⁹ Reid and MacLean, p. 151.

⁴⁰ McClure, p. 492.

⁴¹ Dobres (1995), pp. 29-30.

⁴² Kenneth E. Sassaman, ‘Gender and Technology at the Archaic Woodland Transition’, in *Exploring Gender Through Archaeology*, ed. by Cheryl Claassen (Madison, WI: Prehistory Press, 1992), pp.71-79.

⁴³ Wright (1991).

⁴⁴ M. Kay Martin and Barbara Voorhies, *Female of the Species* (New York: Columbia University Press, 1975) and Margaret Ehrenberg (1989).

that women are often hidden from history when men are the authors. This paper will now focus on several examples of African iron smelting and the dynamic re-negotiation of gender and associated labour divisions through time.

Case Study

Whilst case studies demonstrating the active role of men and women during pottery production are abundant, those demonstrating the role of women in metallurgy are not. In their case study at Karagwe, a nineteenth century African kingdom, Reid and MacLean attempt to elucidate the symbolism and social contexts of iron production, and it is their section on ‘sexual symbolism and female exclusion’ that reveals insight relevant here.⁴⁵

Reid and MacLean confirm that men are the metallurgists, suggesting why through an elucidation of social context. The authors explain that ‘smelting is conceptualised as a procreative act’ whereby the furnace, often constructed with feminine physical characteristics such as genitalia and breasts, represents the woman who will ‘give birth’ to the iron bloom. Men worked the bellows, or phallic symbols, with pelvic thrusts while holding the shaft of the bellows erect. The men periodically ‘spit into the furnace adding ‘semen’ to the ore.’⁴⁶ In many cases, the male smelters introduced ‘medicine’ into the furnace to ensure a successful smelt and a ‘healthy’ bloom. Reid and MacLean admit that many of their ‘informants’ refused to disclose certain ritualistic or symbolic practices due to either the protection of secrets or aspects of the oral tradition that may have been lost as smelting in that region had ceased in the 1940s.

⁴⁵ Reid and MacLean, pp. 144-161.

⁴⁶ Reid and MacLean, p. 149.

The presence of ‘female fertility’ is both ‘threatening to the act of smelting’ and threatening to the fertility of any woman who is near the smelting location, thus requiring the exclusion of women.⁴⁷ Interestingly, non-fertile female children and post-menopausal women are not excluded.⁴⁸ Not only were women excluded from the smelt to prevent damage to the ‘embryonic iron’, but men participating in the smelt were also ‘prohibited from engaging in sexual intercourse before and during the smelt’ to avoid contaminating it.⁴⁹

The history of metallurgy elsewhere in Africa shows different characteristics. Women dominated agriculture in some regions in Africa, the most important economic domain at the time.⁵⁰ This changed around 500 BC as iron technology began overtaking agriculture in economic importance. Schmidt argues that if men dominated iron technology then strong male symbols should mark their domain, in contrast to the agricultural domain of women.⁵¹ Expanding on Herbert’s work, Schmidt explores ‘change and assuming dynamism while simultaneously accommodating continuity’ to reveal how the role of women changed through time, comparing different cultures, from the first signs of strong male symbolism to modern practices.⁵² The role of women in some cultures has increased through the centuries while male dominance has relaxed. This reveals itself in archaeological contexts via subtler male phallic symbols and the increased use of female symbols such as fertility pots and medicines.⁵³ Schmidt reveals that the ‘woman’s menstrual state was of no

⁴⁷ Reid and MacLean, p. 149.

⁴⁸ Herbert, p. 95.

⁴⁹ Reid and MacLean, p. 149.

⁵⁰ David L. Schoenbrun, ‘We Are What We Eat: Ancient Agriculture Between the Great Lakes’, *The Journal of African History*, 34. 1 (1993), 1-31.

⁵¹ Peter Schmidt, ‘Reading Gender in the Ancient Iron Technology of Africa’, in *Gender in African Prehistory*, ed. by Susan Kent (London: British Museum Publications, 1989) pp. 139-162.

⁵² Schmidt (1989), p. 142.

⁵³ Schmidt (1998), p. 160.

consequence, but her reproductive capacity was essential' among the Barongo.⁵⁴ Among the Chokwe the smelter's wife plays an important role during the application of furnace fertility rites, including preparing and/or installing fertility pots or medicines.⁵⁵ These examples provide a contrast to the polluting effects of female fertility in the Karagwe kingdom. Differences in cultural rituals aside, the argument here is that some work discusses the role of women, particularly in metallurgy, to a far greater extent than other work. Whether or not women are playing a primary or peripheral role, the role is important and the discussion needs to treat it accordingly.

This ethnographic case study, while not representative of all ethnography, demonstrates the lack of attention and level of detail and consideration paid to the 'peripheral' aspects of metallurgy: the apparent domain of women. This results in the invisibility of women, whose contributions are subsequently rendered unimportant, uninteresting, irrelevant, and unworthy of study. There is no mention of women participating in peripheral activities in light of potential contamination.

Discussion

Primary v. Periphery

The evidence appears to support the argument that men primarily performed the acts of smelting, smithing, and some pottery making while women performed the 'peripheral' activities. This is not sufficient to promote metallurgy above pottery as a craft, let alone suggest the existence of special relationships. The distinction between primary and peripheral activities remains one of two recurring themes. The other theme is the abundant explanations for the underlying causes, which lack reliable, convincing evidence. Several scholars have proposed models of social organisation

⁵⁴ Schmidt (1998), p. 148.

⁵⁵ Herbert, p. 84.

for the production of ceramics (noticeably absent is metallurgy) to address these underlying causes.⁵⁶ Models of social organisation promote an evolutionary feel, and as societies do not follow a linear progression, simplistic notions of progressive change should proceed with caution.⁵⁷ Models of social organisation have a ‘systems approach’ to them and tend to treat social development in a broad, predictable, evolving, and superficial manner. This approach overlooks the dynamic innovation of individual agency, small groups, and those who challenge the status quo. Consequently, gender is often neglected. Perhaps it is at this smaller scale that archaeologists should seek to explain the underlying causes, an assertion supported by McClure and attempted with limited success by Dobres.⁵⁸

Value Bias

The promotion of supposed masculine above feminine technologies by a male dominated discipline within the ‘archaeological hierarchy of technologies’ still persists.⁵⁹ Ascribing values to ‘female activities’, particularly when negotiated relative to ‘male activities’ and via gender stereotypes, is anachronistic. This serves to undermine the objective aims of anthropology and archaeology. Consider the domestic process of pot cooking. Having such an inferior value ascribed, more often by the scholar than the culture, demonstrates the magnitude of this problem. Why is cooking deemed unimportant when it is clearly the opposite? Consider the amount of skill and knowledge required to serve certain combinations of foods and the dizzying variety of ways to prepare and cook food, and the power that female cooks could

⁵⁶ Rice (1981), and Vincentelli.

⁵⁷ Gary Feinman, ‘Changes in the Organisation of Ceramic Production in Pre-Hispanic Oaxaca, Mexico’, in *Decoding Prehistoric Ceramics*, ed. by Ben A. Nelson (Carbondale: Southern Illinois University Press, 1985), pp. 195-223.

⁵⁸ McClure, and Dobres (1995).

⁵⁹ Wright (2007).

wield, in controlling food by withholding meals, or manipulating the quality or potential pollution of meals.⁶⁰ Why should cooking have a value inferior to that of metallurgy, solely because women controlled this technology in many cultures? These biased value differences are in a reciprocally influential relationship with continuing trends in production research. The lack of recent work, particularly on women in metallurgy, supports the argument that stereotypical attitudes still inform studies on technology and gender.

Looking Forward

It is untenable to suggest that metallurgical advances developed by any means other than an increasingly cumulative, cognitive adaptation learned through a combination of accidental discovery (e.g. heat generated from cooking food in pots annealing immediately surrounding ore), trial and error, and from neighbouring cultures. Any division of labour in metallurgy and pottery perceived to be dictated by an intrinsic ability of one biological sex over another to perform complex and labour intensive activities suffers the same fate. Fundamental specific cultural factors, kinship relations, diversifying economic requirements, and/or adherence to the natural cycles or forces dictating agriculture find favour. Women are capable of performing all of the tasks involved in smelting and smithing. The labour division in metallurgy occurring in many African cultures over the last millennia, demonstrated by the activities associated with procreation and interdiction rituals, is dictated culturally, not biologically.

Female scholars researching in the disciplines of anthropology and archaeology have been increasing in numbers, adding to works by established male

⁶⁰ Dobres (1995) and Rachel McLean, 'Gendered Technologies and Gendered Activities in the Interlacustrine Early Iron Age', in *Gender in African Prehistory*, pp. 163-178.

authors such as Ian Hodder, Nicholas David, and Peter Schmidt. These female scholars, most of whom are cited herein, have propelled gender-based research into what Weedman refers to as the fifth and sixth stages of research, needed to create what she suggests are gender-friendly translations of the past.⁶¹ Their thorough and ground-breaking work, mostly representing only the last twenty to thirty years, includes several key courses of action to remedy the problem of gender bias.

Conclusion

Two potential points of considerable contention remain. First, men have produced the vast majority of current literature and the resulting bias is significant. Second, the extant evidence for the role of women in metallurgy is scarce, because it is likely to have been ignored or incorrectly ascribed to men, by men. The biased deficiency that exists, particularly of the role of women in metallurgy, is problematic. This is due in part to the continued male dominance in anthropology and archaeology. Diversifying the disciplines is one course of action to avoid gender discrepancies, and this has occurred over the last two or three decades. Another course might be to withhold, or avoid ascribing, gender or value to material culture or archaeological contexts, until the presentation of evidence or corroboration substantiates such interpretations. Actively including gender-based questions at every stage of research should inherently promote the consideration of women, as well as children and the aged. One might re-consider the importance of the ‘peripheral’. Avoiding gender-based pitfalls should be a priority to decrease the likelihood of misinterpretations and ascription should be permanently open to re-consideration and re-interpretation. The aim of such research should be to provide an interpretation that recognizes the valuable

⁶¹ Kathryn Weedman, ‘Gender and Ethnoarchaeology’, in *Handbook of Gender in Archaeology*, pp. 247-294.

contributions of the entire population of a culture regardless of gender, class, or ethnicity.

In light of material evidence and the substantial body of anthropological and ethno-archaeological research on non-literate indigenous cultures, the assumptions supporting a scientific, experimenting, male metallurgist, a specialist of industrial production, is untenable.⁶² The lack of integration between metallurgical research and anthropologically informed archaeology remains at least as marked as before, and this fact has a significant impact on the objectivity of the discipline.⁶³ Any study of technology that omits social context is potentially deficient and might miss the target aims of archaeology and anthropology. Researchers should remain true to the goals of anthropologically informed archaeology, one of which remains correlating the findings with social relevance. Central to this aim is the substantiation of unbiased, objective, stereotype-free claims. If archaeologists simply reinforce assumptions about gender while attempting to explain and interpret material culture, this undermines the process of elucidating cultural diversity and only serves to further justify inappropriate gender ideology.⁶⁴

⁶² Budd and Taylor (1995).

⁶³ Budd and Taylor (1995).

⁶⁴ Conkey and Spector (1984).