Furnace and Pot: why the iron smelter is a big pot maker

A case study from South-western Ethiopia

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Introduction

"It will be suggested here that however difficult they may be to recognize archaeologically, the following restrictions on iron-using in Europe must be taken into account:

1. Religious taboos, especially on the use of iron for some purposes (e.g. agriculture) or on the smelting of iron ores.
2. Social traditions may restrict iron making to, for example, either servile or élite groups and may also influence the way iron is used.
3. Political events leading to the control of iron ore sources can deny or increase the amount available to a particular community." (Alexander 1983).

Keywords: Ethiopia, Ironworking, Pot-making

As anthropologists and archaeologists, our concern is to 'explain' processes and conditions, which affect the distribution of cultural remains in time and space. Since conditions directly and indirectly caused by nature appear to be the easiest to recognize archaeologically, archaeologists have, for a long time, tended to prefer ecological or economic deterministic explanations. For instance, the spread and development of iron working in Europe is typically explained as exclusively caused by practical and utilitarian factors. Alexander has argued that evidence from Sub-Saharan Africa shows that for over 2000 years there remained wide differences between communities with regard to adoption and use of iron - a difference which is not explainable as an outcome of ecological and economic processes only, but which has to be understood in relation to additional factors like religion and political power. There is no reason to assume that similar factors were absent in the shaping of iron working in Europe (1983). The lesson is that conceptualisation of processes explaining culture-historical developments in any particular place or region will be vastly improved by being placed in a comparative analytical framework. We shall here pursue this program and extend it to comparison with ethnographic studies of present-day communities. In such studies, we have the opportunity to observe the interplay of ecological, cultural and social processes and on the basis of this, improve the analytical

framework by which we explore and interpret remains of the past. However, we will strongly warn against the simple-minded tendency we see in many so-called ethno-archaeological studies. Namely a) assuming cultural continuities between objects observed today and similar objects found in the archaeological record, and b) assuming that the components (material and non-material) observed in a present-day community are somehow fully integrated in a closed system, and from such a simplistic notion arguing that if similar material components are found on an archaeological site they must have been integrated in a similar socio-cultural system as the one in which they occur today.

In this article, we shall make a description of iron smelting activities as we observed them in a small community (Oska Dencha) in south-western Ethiopia, and on the basis of Data Dea's ethnographic observations from the area of the old Dawro kingdom, try to analyse wider organizational frameworks structuring the position of the smelters in community life.

After a brief sketch of the ethnographic setting and the natural environment of Oska Dencha we shall give a fairly detailed description of the smelting process we observed. Then we shall try to argue that the social differentiation between smelter and forger we observed there is part of a general caste-like division of labour among the Omotic speaking people of south-west Ethiopia. We shall do this in two steps. First, from a sociological perspective we shall place the association between social identity and occupation in different contexts. Then we shall discuss the particular differentiation between smelter and forger from the perspective of cognitive anthropology, by placing it in the context of cosmological ideas current among Omotic speaking people. In another manuscript we attempt a more in-depth analysis of the symbolism of iron smelting and caste differentiation among Omotic speaking people (Haaland *et al.* 2004). The low rank of iron workers in Ethiopia is consistent with what is found in the Sudan savannah belt, Middle East, South Asia, and Tibet, as opposed to the case in Bantu speaking communities (Haaland *et al.* 2002).

Fieldwork, ethnographic setting and natural environment

During ethnographic fieldwork in Dawro, Data Dea had been informed that iron-smelting was still practiced in a small community called Oska Dencha located in a rugged area of mountain ridges, hill slopes and lowlands between the old kingdoms of Dawro, Konta and Kafa (Fig.1). This area was a kind of buffer zone between these kingdoms, and was occupied by several smaller chieftainships (Basketo, Dime, Tsara) that like the Dawro, Konta and the Kafa spoke different 'dialects' of the Omotic language branch. Accordingly, in March 2000, we settled in the village of Oska Dencha within the previous Tsara (in ethnographic literature also called Ch'ara) chieftainship and established contact with Chilacho, the master smelter.

South-west Ethiopia is a transition zone between the Ethiopian Highlands and the Nile flood plains of south-east Sudan. The type of natural features of this region has played an important role in shaping the culture-historical developments among the people of this region. Human settlement in the region has also partly been shaped by varying opportunities for agricultural and pastoral production in different environmental zones, and partly by considerations of defence - particularly in periods when the region was drawn into more global spheres of political influence and economic exchange.

Oska Dencha (about 225 households) is situated at an altitude of roughly 2000 metres on the escarpment on the western bend of the Omo river, overlooking the Omo

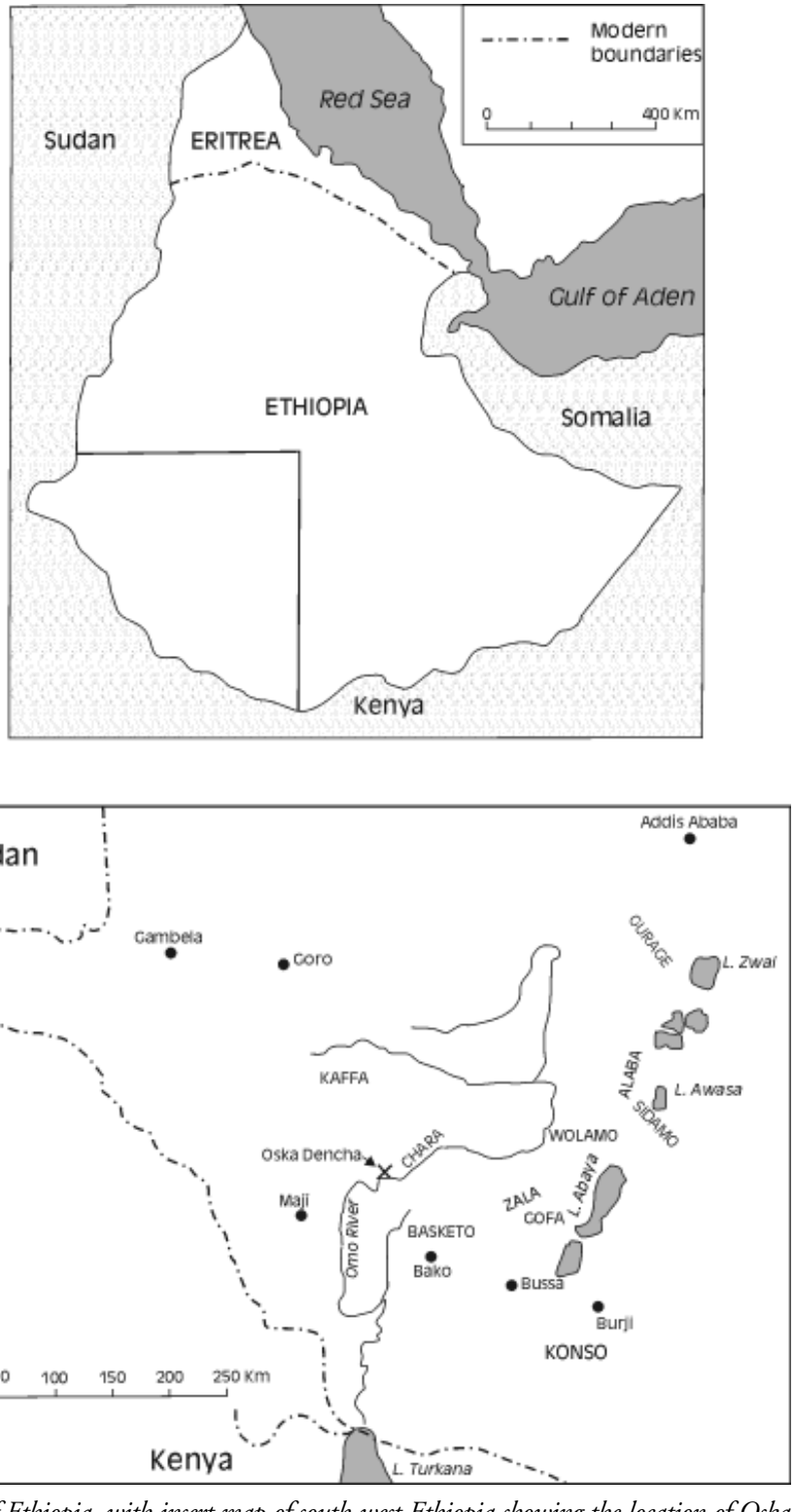

Fig. 1. Map of Ethiopia, with insert map of south-west Ethiopia showing the location of Oska Dencha

valley to the south, and the smaller Dencha river to the west (Fig. 1). To reach the Jimma road one has to walk about 100 km northwards over very rugged terrain. Alternatively, one may walk 60 km, crossing the Omo river gorge, to reach Laha where a dry season road connects with the Sawla road. The difficulties of access have so far discouraged traders to open shops in Oska Dencha, and have served to restrict the import of bulky or heavy goods like scrap-iron. However, on the weekly market day the village was visited by itinerant petty traders selling basic consumer goods like cloth, sugar, and salt whilst purchasing coffee beans and honey.

The villagers are farmers and keep some livestock, mostly cattle and goats. The main crops cultivated are: ensete, teff, various types of sorghum, corn, yam, taro, maize, bananas and some coffee. The houses and plots of cultivated land are quite dispersed. It takes around one and a half hours to walk from one end of the village to the other. Most of the land is cultivated by slash and burn. Ploughs are used on a few cleared plots for cultivation of teff. The main agricultural tool is the digging stick, with or without an iron point.

The population of the village mainly consists of Tsara speaking people and is divided into ranked social strata associated with specific occupations. In Oska Dencha, the iron smelters belong to a social category in Tsara language named *mana* (the term used for potter in Dawro dialect), and members (four households) of this category were the only craft specialists in the village. In addition to smelting, men performed forging while women did pot making. The Tsara also call the smiths *Dime mana* since they had immigrated from Dime. Their settlement was located in a lower lying part on the outskirts of the main village. Otherwise, their houses were similar to Tsara farmers. Previously they were not allowed to own land and livestock, but today they cultivate as well as rear animals. In the past, it was claimed that they were dependant on the chief for their food and in return had to provide iron objects needed for agriculture and war as well as special spears for the investiture of chiefs.

The trajectory of iron products

Appadurai has advocated that it is "things-in-motion that illuminate their human and social context" (Appadurai 1986: 3). By looking at the practical and symbolic concerns behind the movement of iron objects through their trajectories we have a vantage point for interpreting "the human transactions and calculations that enliven things" (*ibid.*). The trajectory of iron can be illustrated in a simple diagram (Fig. 2), where iron items can be seen to be transformed as they are moved through various 'stations' (Haaland *et al.* 2002).

Iron making involves at least two quite distinct technological tasks: smelting of iron and forging of iron artefacts. Generally, it is the same occupational specialist, the blacksmith, who undertakes these two tasks. Among the Dawro, however, these tasks were performed by two strictly separated occupational specialists of different rank in an embracing system of social stratification. A few similar cases have been reported, such as the Babungo in Cameroon (Fowler 1990: 232), and the Banyoro in Uganda where the smelters "are a distinct class from the smiths and rarely work with iron after smelting it and conversely smiths rarely smelt it" (Roscoe 1915: 75).

We focused our study on the 'stations' in the trajectory of iron-products connected with the smelting operations.

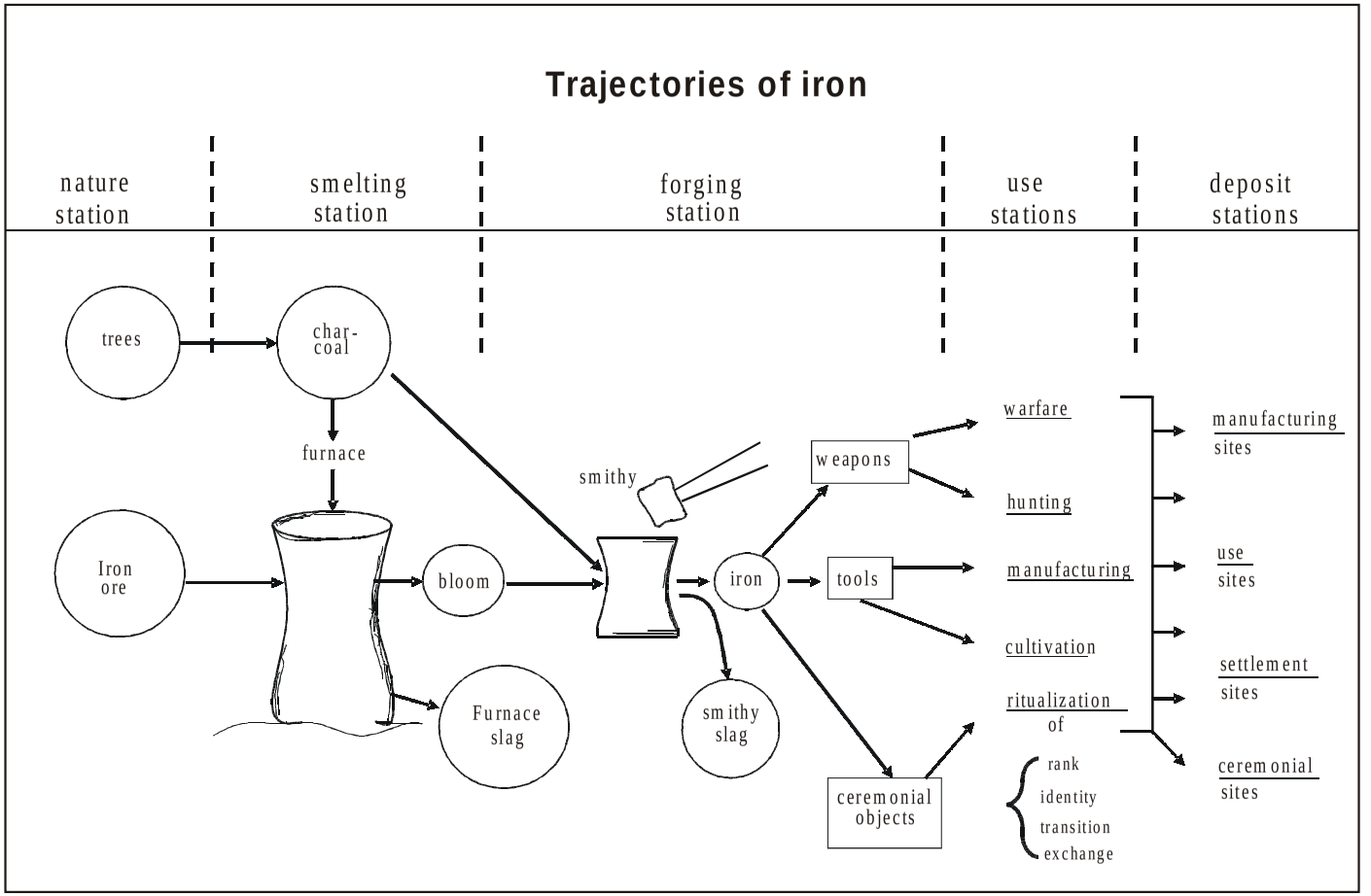

Fig. 2. Trajectories of iron. The distinction between furnace slag and smithy slag is important to note, because technical analysis may indicate whether a slag was associated with smelting or with forging.

A group of six people - all close relatives of the master smelter Chilacho participated in activities in the 'stations' in the trajectory we shall discuss here - the 'nature station', the 'smelting station' and to some extent the 'forging station'.[1]

The 'nature stations'

At these 'stations' raw material — ore and charcoal — is made ready for the smelting operations.

Iron ore is found along the hills at a distance of one hour's walk from the furnace. The ore was extracted from small pits with digging sticks. Before extracting the ore, Chilacho sat down to drink local liquor after first having poured part of it to the ground outside the pit, as a sacrifice to the god of his ancestors. The pieces of ore retrieved were crushed at the site before they were brought to the furnace.

A group of nine men from the village had been mobilized by Chilacho to extract ore as well as to make charcoal for the smelting.

The 'smelting station'

A range of activities took place at this station, such as construction of tuyeres, bellows, furnace, and the actual smelting operations where iron-ore is transformed to bloom.

Making of tuyeres

Both Chilacho and his wife made the tuyeres - small (12 cm long) ones called *zeida* and a larger (25 cm long) flared type called *tsole*. *Tsole* (all the names connected with smithing are in the Tsara language) also refers to the penis while *zeida* refers to the foreskin of the penis. The number of tuyeres was 15 of each of the two types. The clay used is the same type of clay used for making pots. The tuyeres were either sun-dried or put close to the fire for drying.

Construction and repair of furnace

During our first fieldwork we did not observe the construction of a new furnace, and the following information is primarily based on what Chilacho told us:

The wife should fetch water (generally considered female work) and participate in mixing clay. It takes about nine to ten days to make a furnace. The furnace is built in layers. It is dried by the sun and by firing the inside with bundles of grass and green wood.

The furnace should be erected outside the homestead in bush land in order to prevent people who were ritually unclean (mainly menstruating women) from harming the smelting operation. In contrast to the common practice in other areas in Africa, where the furnace is broken up after each smelt in order to take out the bloom (Haaland 1985), the furnace used in Oska Dencha was re-used several times because the bloom is removed through the opening in the top. Damage, e.g. cracks, which may occur after a smelt, is repaired before the next smelt by a plastering of clay. The smelting we observed

[1] Chilaco smelted iron regularly twice per year, this is probably one of last areas where these activities still take place. However, we emphasize that the smelting operation we observed was 'commissioned' by us, and would not have been undertaken at that time if we had not been present. Chilacho was paid 15 birr per day plus a goat, beer and liquor for undertaking the operation. Since the extraction of ore, the preparation of charcoal and even the actual smelting operation required more labour than was available in the *mana* households, we had to pay for labour-inputs from non-*mana* households. These other participants were also paid 15 birr.

took place in such a repaired furnace.

The furnace was 80 cm high, and underneath the furnace was a 40 cm deep slag pit. The furnace wall was 12 cm thick and the inner diameter of the furnace across the mouth (opening) was 42 cm (Fig. 3). Radiating around the base of the furnace were 15 holes made for the five pot bellows to be attached to the tuyeres. Each pot-bellow had three openings for the small tuyeres.

When the repair of the furnace was completed, a goat (no restriction on sex or age) was sacrificed and the blood spread around the outside of the furnace. It must not come inside the furnace, since this was said to cause the people who ate the sacrificed meat to die. The only taboo connected with furnace constructions was on women who should not be menstruating since such ritual impurity was said to be harmful to the smelt. There are, otherwise, no prohibitions on women participating in making the furnace or smelting the ore.

In October 2003, during a TV recording of iron smelting in Oska Dencha, we had the opportunity to observe construction of a new furnace. The observations were consistent with what Chilacho had told us. One event that occurred during the construction did however significantly deepen our understanding of the metaphoric linkages between smelter and furnace. During the construction work Chilacho had tied a creeper around his waist just above his shorts. When the slag pit was dug and Chilacho went into it for lining the walls with clay blocks, he suddenly took off his shorts and entered the pit naked.

Villagers would not participate in construction work because this is a marker of blacksmith identity.

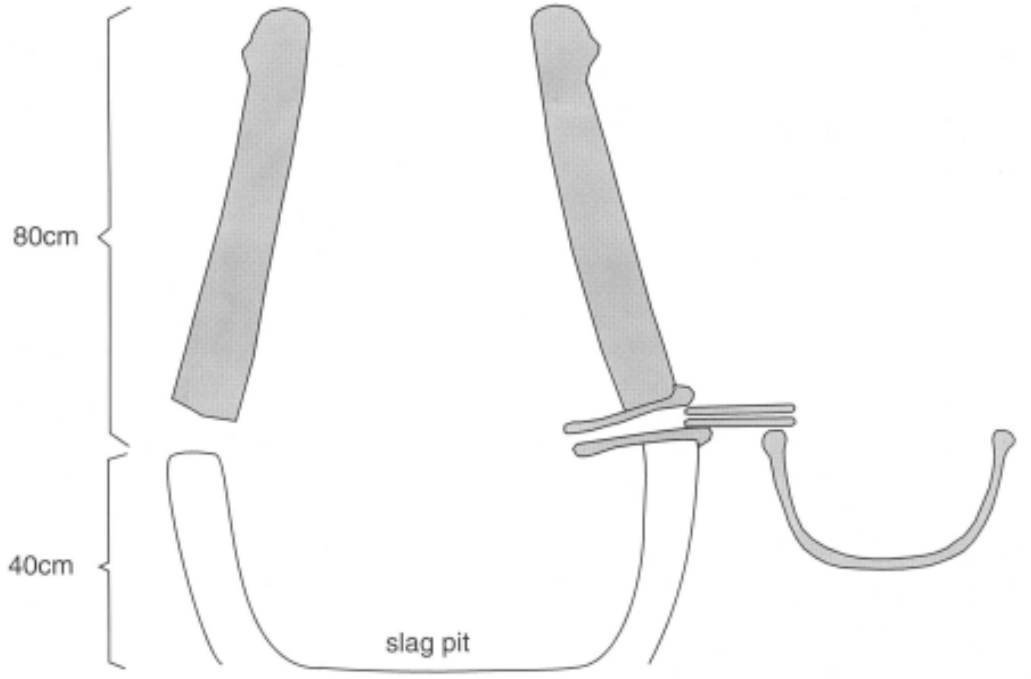

Fig. 3. Cross-section of the furnace with pot-bellows and tuyeres put in place

The making of bellows

There were 5 pot bellows with a diameter of 0.4 m across the opening. The same type of clay soil that was used to make the bellows was used to repair the furnace. The clay was kneaded with the feet at the furnace site. Villagers did the mixing of clay and water; however, Chilacho and his family made the pot bellows. A depression was dug, around which the pot bellows were constructed (Fig. 4).

Fig. 4 Chilaco inspecting the furnace made ready for smelting; note the pot-bellows and tuyeres in front of the furnace. (photo Gunnar Haaland)

The distinction between the task of mixing clay and the tasks directly involved in using this clay for making of the furnace-associated items is important. Mixing of clay is something that takes place for a variety of purposes, and is not loaded with special symbolic meanings. The use of mixed clay for making of tuyeres, pot-bellows, and the construction of a furnace is, however, loaded with sexual associations. The male furnace constructor is linked to the womb-associated furnace, and the female tuyere maker is linked to the penis-associated tuyere. An incident occurred, during our first fieldwork, when we came to the furnace site. Three clay pot bellows had been broken. According to Chilacho, children of Tsara farmers had done this (Tsara farmer identity is ranked above the identity of artesian castes). He was furious and would not come near the furnace until some of the people from the village had removed the broken pieces. He then sacrificed three pieces of iron ore and one tuyere together with 10 birr (Ethiopian currency), which he put under a tree about 10 metres away from the furnace. From a cup, he drank some liquor after having poured part of it on the ground as a sacrifice to what he called his father's devil (in this context meaning father's spirit). He then cursed the people who had broken the pot bellows in the names of Merriam (St Mary), his father's devil, and his father who created him.

Chilacho went on to say "what they broke were the pot bellows, what they meant was to make me and my family sick. Since they broke the pot bellows I have been sick and my family have been sick. To protect me from the evil actions I have to sacrifice". Then Chilaco showed us his finger which had been damaged when smithing and said that this was due to the pots having been damaged. When they were re-making the clay pots for the bellows, he took a stone, threw it into the furnace, and again cursed the boys who broke them saying "may the boys' stomach be hurt like the pot bellows were". As in

many African societies, the blacksmith is believed to possess magical powers. The efficacy of his curse is of course never empirically observable, but like witchcraft beliefs it serves as an explanation when somebody is struck by misfortune and, therefore, works as a sanction on harming him.

Preparing for the smelt

The raw material consisted of 107 kg of ore, and 120 kg of charcoal. The smelter started by smearing cow dung mixed with water around the rim and inside the pot bellows. According to him, to ensure a successful smelt, this should be dung from a heifer. The larger tuyeres were fitted to the base of the furnace with wet clay soil, while the small

Fig. 5 Chilaco attaching the two types of tuyeres to the furnace with clay (photo Randi Haaland)

tuyeres were fitted between the opening of the pot bellow and the large tuyeres. The five pot bellows were set into the ground and partly dug into the ground, slightly tilting towards the furnace. The small tuyeres bridged the opening between the pot bellows and the opening of the large tuyeres, while the larger tuyeres were stuck into the furnace, and sealed with clay into the base of the furnace (Fig. 5). The smaller tuyeres were sealed with clay to the holes on the outside of the clay bellows. The opening of the pot bellows were covered with goatskin, and tied to the top of the pot bellows with a rope, made of plant fibre. A hole had been made in the centre of the skin, which served as a valve.

The smelting operation

Four bundles of long dry grass, which had been put into the furnace, were lit from the top and from the openings at the base. Charcoal was then added. When the burning charcoal was red-hot the smelter put the first tray of iron ore into the furnace. Filling of charcoal and ore was done with a long wooden tray. Charcoal and ore were filled continually with the ratio of three trays of charcoal to one tray of ore. When they started

to blow the bellows, Chilacho sacrificed a goat. The throat of the goat was slit and the blood smeared on the furnace and the pot bellows. Five people worked the bellows. After nine hours Chilacho said he could tell from the colour of the flame, the noise made by the slag, and the content of the furnace that the smelting was completed. The furnace was then left until the next morning for cooling.

There are few taboos associated with smelting. Menstruating women could not participate since they could pollute the furnace. Smelters should abstain from sexual intercourse during the smelt. If a person has had sex and he then blows the bellows it was said that the fire would burn him. Charcoal is hot and said to symbolise semen. Similarly, shamans should not be present when preparing the ore for the smelting. During the first day of the smelting we observed that a person identified as a shaman was ordered by the smith to leave, since anything he would touch would be polluted and would damage the work.

Recovering the iron bloom

The next day, water was poured into the furnace to quench the bloom. An iron stick was used to break up the bloom and slag. Chilacho's son climbed inside the furnace through the top to take out the bloom, which consisted of iron, slag and charcoal. He handed this to his father who examined it and carefully picked out pieces (Fig. 6), which he put aside as either good iron or what he called 'un-cooked iron'. This last group consisted of iron ore where the slag had not been successfully removed. He judged this to be caused by rain, which had fallen during the night before the smelt, and that the ore therefore was not sufficiently dry. He estimated the yield of the iron to be enough to make two irons picks.

Fig. 6. Chilaco inspecting the bloom taken out of the furnace (photo Randi Haaland)

The 'forging station'

Chilacho also operated a small smithy under a thatched roof with open walls. The smithy is used for forging iron tools and for repair. Today, with less smelting going on, the repair of implements is the most important activity.When a smithy is made, according to Chilacho, a goat should be sacrificed in order to ensure that good iron tools are made. The blood of the sacrificed goat is put on the pot bellows, the hearth and the anvil.

Ethnographic contributions to the study of iron smelting in Southern Ethiopia

Eike Haberland was the first to do an ethnographic survey of Dime and several other groups in the area in the 1950s (Haberland 1959, 1978). Judith Todd did more extensive

study of iron smelting among the Dime people to the south of our area, during the mid 1970s (Todd 1975, 1976, 1977, 1978, 1985; Todd and Charles 1978). Neither of these two scholars did any work among the Tsara people. Todd concentrated her study on the technological aspects of iron working and paid little attention to the social context. Our observations on the technical parts differ from hers in only minor respects, e.g. the size of the furnace, the number of tuyeres, the timing of making and repairing pot bellows. Haberland's measurements are similar to ours. During Todd's fieldwork there were about 40 adult smiths still working in the Dimam. She emphasises that, although not all Dimi manufacture iron, they participate in getting the ore and charcoal as well as in the actual smelting process. What seems to come across is that the Dimam area was an important iron-producing centre. Both Haberland and Todd observed the presence of women in the smelting activities.

A regional perspective on division of labour and social identities.

Although iron-production in Oska Dencha today is of minor importance and only for local use, in earlier periods when scrap-iron was absent and the region ruled by strong centralized kingdoms this seems to have been very different. This buffer zone between Dawro, Konta and Kafa was the supply area of the iron products of vital importance militarily and economically. It seems surprising that none of the three competing kingdoms controlled the area politically although they all depended on supplies of iron from it. The reason may be that the rugged topography and prevalence of diseases made political control costly.

The iron-smelting which developed in this area thus has to be seen in a larger picture of regional division of labour between the iron rich but agriculturally relatively poor area of Basketo, Dime and Tsara, and the agriculturally relatively more productive areas of the kingdoms.

We have seen that smelting in Oska Dencha is an occupation associated with a specific social identity termed '*mana*', and that holders of that identity are also iron-forgers and pot-makers. Such an association between occupation and social identity is a characteristic feature of the social organization of south-west Ethiopia. There are, however, significant variations within different Omotic groups with regard to complexity and relative rank of the caste groups. We shall illustrate this with some material from Dawro.

Occupational identities in Dawro

In Dawro, social identities each associated with occupational tasks are still taken as basic principles for daily interaction in a variety of fields, e.g. economy, marriage, ritual, residence (Dea 1997, 2003). These identities are ordered in ranked strata (*yara*) as follows:

Malla	Citizens, farmers, rulers
Wogatche	Iron forgers
Degelle	Tanners
Gitamana	Iron smelters
Mana	Potters
Manja	Charcoal-makers, forest users, former hunters

Gitamana means the big pot maker, and the task of smelting is conceptually associated

with the task of pot making, not with the task of forging iron. This is very much related to transformation of natural elements (ore and clay) by fire to cultural products (iron and pot). Intermarriage and commensality between members of different *yara* (castes) leads to pollution and requires purification rituals in order to avoid the danger of supernatural afflictions as well as of social sanctions.

There is a differentiation between iron smelter and the forger, and the latter is ranked highest among the occupational groups, while the smelter *(gitamana*) is associated with the pot-makers (*mana*) and ranked close to the bottom of the hierarchy. We shall here draw attention to the sociological and cognitive reasons underlying the distinction in rank between smelter and forger, rather than the getting involved in futile conjectures about its historical origin. Regional observations from other Omotic groups show that the distinction does not correlate with recent introduction of scrap iron.

Comparison between Dawro and Oska Dencha

If we compare Dawro and Tsara with regard to the identity of the main actors at 'stations' in the trajectory of iron, important differences are easily recognizable. For the Dawro, the *yara* of Chilacho is *gitamana* because he smelts iron. Chilacho strongly objected to being labelled by this term and insisted on being addressed as *Dime* - the rank-neutral name of the group he had come from before settling in Oska Dencha. However, in daily interaction he was clearly set apart in various spheres of activity, e.g. with regard to marriage and commensality. In Dawro, forging activities are associated with *wogatche* identity, a *yara* superior to the *yara* of the person who performs the smelting, i.e. the *gitamana*. The Tsara do not differentiate between smelter and forger identity. The *yara* identity Chilacho occupies thus depends on whom he is interacting with - if it is in Dawro he is a *gitamana* almost at the bottom of the hierarchy, but if it is in Tsara he is at least above the tanner *yara*.

In Dawro, there is thus a clear social differentiation between the people who move iron objects through their trajectories - the 'movers' at the 'smelting station' are categorically different from the 'movers' at the 'forging station'. If we compare the trajectories of iron objects with the trajectories of clay objects we see a striking association between the 'movers' at the 'smelting station' with the specialists who move clay objects from natural elements to cultural products.

The wife of Chilacho makes pots. Her social identity is *mana*. She is born into that *yara*, her father was a smith and her mother was a potter. In this marginal area the three tasks (smelting, forging and pot making) which in Dawro are associated with three different *yara* identities are here performed by families of the same caste, but with a division of labour based on gender within the family - women primarily making pottery and men primarily doing iron-work.

However, similar ideological constructs legitimate the social separation between occupational specialists in the two areas. The hierarchy of occupational identities is much simpler in Oska Dencha than it is in Dawro, probably because the Tsara chieftainship was much weaker than the Dawro kingdom and not able to generate the economic surplus required for maintenance of a more elaborate division of labour through the kings' or chiefs' redistribution.

The socio-cultural contexts

Linguistically, the people of the region belong primarily to Omotic languages of the Afro-asiatic language family. Although they were under different chiefly states, important social ties cross-cut the rival state boundaries. Kinship and marriage networks thus extended over the whole region, and so did the very important clan membership. People captured in raiding between states would, therefore, have clan-members among their conquerors and although they would be slaves they would still belong to the same clan (*quomo*) as free clan members, and ranked above artisan castes. Likewise, the networks created by occupational caste identity were spread across state boundaries despite the fact that within different states there was a certain variation in the relationship between occupation and *yara* identity, as well as in *yara* ranking.

The caste context

Despite certain cultural variations within the region, the population shared the basic principles of the same cultural grammar, with *yara* identity constituting a most important category structuring people's interaction in daily life. The interplay between external relations and developments internal to different states served to create a certain variation with regard to which *yara* was present in any particular community, and the range of occupations which were considered consistent with specific *yara* identities.

No matter what the ranking of occupation-related identities were in different political units, the separation between *yaras* was expressed in similar ways in rituals as well as in beliefs about the iron-workers' supernatural powers. Intermarriage and commensality between members of different *yara* led to pollution and required purification rituals in order to avoid the danger of supernatural as well as social sanctions.

The rigid division of labour found in different forms in the centralised political units in the Omotic region is based on identification of a person's occupation with his total personal identity, and is sanctioned by restrictions on commensality, marriage and other forms of social intimacies. To break such restrictions exposes people to 'polluting' influences that require purificatory ritual action in order to avoid the supernatural and social sanctions. For comparative purposes we shall translate the Omotic term *yara* with the term caste (an English word derived from the Portuguese word *casta* origininally meaning species), in order to refer to a type of social organization characterized by association of occupation with ranked social categories and where interaction between members of different categories are strictly regulated in various areas of activity.

The trading context

There are indications that south-west Ethiopia as long as 1500 years ago had been drawn into the Aksumite trade, despite the formidable logistic problems involved (Wainwright 1942). The most important trade objects from south-west Ethiopia were slaves, ivory, and musk. Warfare was a most important source of slaves. The accepted forms of payment for slaves were *amoleh* (standardized lumps of salt used as means of exchange), cloth, copper or beads.

Control over the supply area of trade items and over the routes through which the items had to be moved was an important basis for the emergence of centralised political

systems in south-west Ethiopia. Abir (1968: 52) argues that in this area of south-west Ethiopia where a centralised system of government was only just emerging or was unknown, merchant caravans could not travel without local chiefly protection. We think it is likely that the trading context stimulated the emergence of local political systems strong enough to both protect and tax the caravans and that the capacity to exercise these two tasks depended on a specialized military-administrative apparatus based on a relatively efficient division of labour in agriculture and craftsmanship. From this, we think that the caste-like stratification we observe today has its origin in the functions it served as a principle of division of labour in the emergence of the early Omotic states. The revenue from control over inter-regional trade must have been of great strategic importance for the rulers because by redistribution of imported items they could organize staff in lower politico-administrative positions in relations of dependence. It is very difficult to understand how a hierarchical caste based division of labour could have emerged unless it took place in the context of a centralized political system, and given the natural environment it is difficult to see how the economic surplus required for such centralization could have emerged outside the trading context.

The political context

Historical records show that several centralised kingdoms (e.g. Kaffa) had emerged in the region during the 15th century and some, such as Woleita, even earlier in the 13th century, according to Beckingham and Huntingford (1954).

These centralised political units seem to have revolved around a redistributive economic system based on a rigid division of labour between different occupational specialists, including administrative and military staff. The circulation of goods and services between the occupational specialists was apparently co-ordinated through the king's centralised administration. It is probable that among the main factors in the political centralisation process was the outside demand for some major products of the region - its people and its ivory. The risk of being raided is clearly a factor, which may make people willing to delegate authority to a political centre for their own protection. A further source of authority for the emerging states is found in income derived from control over regional export products: slaves and ivory. From their location on the more defensible mountain plateau, the kingdoms could raid each other for slaves for export and also for domestic labour.

It is in the context of rival states and trade we see the development of caste-like craft specialisation. In particular, production of iron-made means of destruction (weapons) and to some extent, means of production (agricultural tools), as well as products and services for élite consumption at the courts. We assume the administrative-military apparatus developed for defence also increasingly came to serve as a tool for internal protection of caste-based privileges. In this context, we see the development of internal enslavement as a consequence of debt and public offences.

Ideological context

If our argument about the evolutionary interconnection between growth in state power and development of a caste-like division of labour in pre-monetary states is accepted, this does not explain why smelting and forging are associated with different social identities. It is difficult to see any politico-economic reason for this.

We think the reasons for this lie elsewhere. Firstly, the Dawro term for forger identity (*wogatche*) contrasts with the term for smelter identity (*gitamana*), which is conceptualised as similar to potter identity (*mana*). The smelter and the potter are thus considered similar kinds of identities at the bottom of the rank system contrasting with the highest ranked craft identity, the iron forger (*wogatche*). This surprising contrast between smelter and forger is, we believe, in south-west Ethiopia based on a deep-lying metaphoric association between smelting and pot making as activities involving polluting transformation of sacred earth.

The furnace is perceived as the womb of a woman. When they take out the iron bloom they say the woman (the furnace) has given birth, and the slag (*shane*) is seen as the after-birth *(gupe*). Through the smelting operation a new object is created. What was ore has, through the smelting operation, become bloom.

The metaphoric association of the furnace as wife of the smelter was indicated in the events that took place when Chilacho started lining the walls of the slagpit. This is further elaborated in the association of giving birth as similar to smelting iron. This metaphor is manifested in the idea that the woman giving birth is polluted and so is the husband if he gets in contact with substances related to the birth process, e.g. blood, placenta. Likewise when the furnace as the metaphoric wife of the smelter yields slag and iron, the smelter is polluted because he cannot avoid getting in contact with these birth associated substances. When a woman in Dawro is giving birth she is brought out of the house to a specially erected hut to avoid polluting a primary social unit, namely the family. Likewise, when the site for the furnace is selected it is located outside the village to avoid polluting another fundamental social unit, namely the village community.

The metaphorical association between giving birth and making iron is manifested in the idea that the woman giving birth is polluted. Likewise, when the furnace as the metaphoric wife of the smelter yields slag and iron, the smelter is polluted. When a woman in Dawro is giving birth she is thus brought out of the house to a specially erected hut. This is to protect the village; similarly, this is manifested in the location of the polluting smelting activity outside village boundaries.

Ideas associated with smelting are thus closely related to general ideas about procreation, which we find to be a cross-cultural phenomenon (Cline 1937; Wise 1958; Willis 1978; van der Merwe and Avery 1987; Childs 1991; Collett 1993; Herbert 1993; Rowlands and Warnier 1993; Barndon 1996; Schmidt and Mapunda 1997)

In his fieldwork in Dawro, Dea found that it is not furnace or pot making as such which are polluting. Rather the issue has to do with fire, and its supernatural power to affect fertility, prosperity and human life in general. It is widely believed that the *mana's* firing of pots and the smith and smelters blowing of their bellows will burn or blow away the *anya* (spirit) of prosperity. In particular, the noise made by bellows is said to disturb the spirit in the vicinity. As noted above, the taboos associated with smelting are few. If a person has had sex and he then blows the bellows he will be burnt by the fire. Charcoal is hot and seen to symbolise semen.

In Dawro conceptualisation of iron smelting and pottery making are intimately connected as being performed by members of two closely linked crafts specialists *gitamana* and *mana*. The two activities and the objects they deal with have features which convincingly can be used to symbolise similarities as well as differences in other domains of experience. Both involve transformation of natural things (ore to iron, clay to pot) by the use of the same transformative agent - fire. The transformation of ore to iron does

take place in a container. Both furnace and pot are constructed from clay but they differ in the sense that the furnace is sun-dried while the pot is burned. The two containers are also similar in the sense that they are vessels for transformation of natural items (ore and grain) to cultural items (iron and porridge or beer).

The potter, like the smelter, is a master of fire. It is with the fire that one controls the passage of matter from one state to another (Eliade 1962: 78). The female and the male domains of the *mana* and *gitamana* categories are on one hand, very different, but on the other hand bound together by earth and fire. In Dawro conceptualisations, it seems that it is the idea of pollution attached to transforming elements of the earth by fire which is the basis for setting smelter and potter apart from other castes as two closely linked castes, while the craft specialist (*wogatche*) who transform bloom (an object already de-linked from elements of the earth) to iron is not in a similar way polluting the earth. Nevertheless, he too is using fire and is considered anti-fertility. It is important to emphasize that not all transformations of fire are polluting, only those where fire is used to burn the sacred earth.

Ideological variations

Hallpike (1968) observed similar ideas about fire among the Chusitic-speaking Konso bordering the Omotic speaking people. Fire among the Konso is closely associated with production of food. To use fire to cook earth (smelt ore) is considered unnatural. Fire is, furthermore, associated with ambivalent meanings: on the one hand, it is a beneficial component in the making of food, on the other hand, and it is regarded with aversion as a hostile and destructive force. Earth, in contrast, is sacred and prayers are offered to it. The unnatural use of fire to "cook" earth in smelting iron (an inedible substance), and in the later stages to forge tools and weapons at the anvil, thus seems to be related to a religious opposition between earth and fire.

Among the Omotic speaking Maale the first *Kati* (king) made fire, and fire delimited or defined the boundary of the chiefdom (Donham personal communication).

Todd (1977) also noted the importance of fire among the Dime. Although the Dime have a myth relating to the discovery of fire, they appear to have none concerning the origins of iron working, simply maintaining that they have always produced iron. Hallpike (1968) explained the polluting nature of craftsmen among the Konso as partly resulting from the substance they work with. According to Todd, this does not apply to the Dime. Neither the ore and the smelting process, nor the finished product, is considered polluting. Todd also claims that there is a prohibition on smiths entering farmland, which is said to protect the growing crops and not the earth itself, since they can walk through the empty fields without restrictions (Todd 1977).

No higher Dime will eat or drink anything that has been inside the smith's house. A smith must never enter a Dime house, and a Dime will not touch a smith's personal property nor allow a smith to touch his, lest some *gome* (misfortune caused by moral transgression) should result. Smiths sacrifice only goats or sheep. They do not sacrifice on higher areas like mountaintops but on a stone near the house, which is always below the village to which they are attached. A smith makes private offerings near his house, which is below the village in order to ensure his personal success in his work.

Conclusion

Pankhurst (1999, 2001) has recently questioned the fruitfulness of applying the concept of caste to Africa, basically because it does not take into account history, culture and society. We agree with Pankhurst that if the concept of 'caste' is not applied to the whole society but only to marginalized groups it is not fruitful. What our material indicates is that in south-western Ethiopia there is a pervasive differentiation of ranked social identities in named categories, that these categories are associated with occupations, and that these occupations are tied together in a society-wide division of labour. We think that the Dawro case satisfies the principle that Barth (1960) has argued is relevant for a sociological conceptualisation of caste; namely, that it is a system based on status summation in such a way that having one particular status, e.g. occupation, means that one also holds a specific cluster of other types of status e.g. ritual, kinship, political. From a sociological perspective caste is a type of social organization based on a ranked clusters of statuses. *Yara* is just such a ranked cluster of statuses.

Comparative ethnographic material (Barth 1960, Berreman 1979, Tuden and Plotnicov 1970) indicates that structurally very similar forms of stratification have emerged in very different cultural contexts, and that they are intimately linked to the growth of political power centres with control of coercive force strong enough to extract an agricultural surplus from a large number of cultivators. The livelihood of the crafts and administrative specialists thus depended on maintenance of the redistributive political systems.

Ideological and ritual elaborations legitimising particular caste systems may, of course, differ - Hinduism is just one cultural variety of this. Dumont's (1972) culturological perspectives are thus considered irrelevant for sociological comparison since they are based on a highly intellectualised representation of the particular ideology, which legitimises so-called caste in India.

Social arrangements and ideologies are, of course, interconnected and do reinforce each other. The point is that there is no one-to-one relationship between them. While we argue that politico-economic processes are fundamental in the culture-historical origin of caste organisations and that ideologies were secondary, this does not imply that ideologies developed in a caste context cannot be reproduced outside a caste context. This is quite clear in the Indian sub-continent today where division of labour is primarily based on capitalist principles or on Governmentally organized enterprises, but where caste identity is still to a large extent made relevant in some fields of activity like marriage and ritual, a relevance which is underpinned by Hindu ideology. Hindu ideology is thus very important if we want to understand the relevance of caste identity in South Asia today, but it cannot serve as a criterion for defining the type of social systems we have called caste. Furthermore, the Bali Aga in Bali are Hindus but they do not have any traces of ranked castes (Barth 1993). The function of caste identity in the Indian sub-continent today should not be confused with the functions that were effective when it emerged. Once originated, a form of social organisation may be reproduced through other mechanisms or for other reasons than those that favoured its origin (Barth 1993). One should therefore not confuse "current utility with historical origin" (Gould 1990: 35). Furthermore, when an ideological link between an occupation and social identity has emerged it may be adopted by groups living at the margins of states e.g. as we can see among pastoral groups from India to Africa.

We have here tried to place the observed events of iron smelting first into sociological

contexts in order to understand the close association between craft and caste identity, and second into contexts of metaphorization in order to understand the peculiar differentiation between smelter and forger in the Dawro case. We hope that our analysis has contributed to an understanding of processes which affected the spread and development of iron-working in south-west Ethiopia and that our conceptualisation of the interplay between natural, economic, political and religious conditions can serve the archaeologist as tools for thinking about the fragments of information stored in the archaeological record with regard to clues they may contain about the processes which shaped the cultural forms of the past. If we have succeeded in this we have contributed to the comparative program John Alexander outlined. However, if the archaeologist just takes our description of south-west Ethiopian empirical forms as a 'model' to be automatically imposed as an 'explanation' of particular archaeological assemblages, we have not succeeded. Forms of social organization and cultural construction affecting ironworking vary in time and space. We have drawn attention to *processes*, which create a kind of 'family resemblance' among cases of iron working. Only by imaginatively scrutinizing the total archaeological site record - instead of only concentrating on iron working remains - can we realistically claim that similar processes to those described here were operative. There are cases of iron work which share little or no 'family resemblance' to the case we have analysed here; e.g. iron working among most Bantu speaking people does not seem to be organized on caste principles. We expected that there would be variations in symbolism constructed around ironworking, but here significant similarities among culturally and organizationally very different people have struck us. Perhaps it is 'in the cards', so to speak, that people independently tend to 'play' the 'metaphoric game' in ways which link the process of iron-production to the process human reproduction (Haaland *et al.* 2000).

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