TRADITIONAL BLACKSMITHS AND METALWORKING IN KENYA

AN ETHNO-ARCHAEOLOGICAL APPROACH

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PLATES
A. Agricultural Pokot smithy in the smith's banana grove beside the Weiwei river at Sigor. Rondavel type.

B. Marachi smithy on a hillside near Odiado. Rondavel type.
A. Marachi smithy under construction.
   Rondavel type.

B. Agricultural Pokot smithy.
   Rondavel type.
A. Marachi smithy with earth excavated from the floor banked up round the perimeter. Note heap of scrap iron.

B. Modern Kikuyu square variation of the rondavel type.
PLATE 4

A. Digo open-ended smithy. Rectangular with pitched roof.

B. Swahili smithy open at one end only. Rectangular with pitched roof.
A. Samburu smithy built into the brushwood perimeter of the homestead, and against a tree. Entrance outside. Brushwood type.

B. Mbeere smithy, with supporting upright, built between bushes. Brushwood type.
A. Karachi open-topped smithy built between bushes. Brushwood type.

B. Kisa smiths working in the open under the shade of a tree.
A. Masai walled-in smithy.
   Note. Women of the smiths family peer in because the researcher was inside, but will not go in.

B. Marakwet smithy at Chesegon.
   Note. Children watch but dare not enter.
   Rock shelter type.
A. Marama open smithy near a small trading centre. Note scrap iron which no-one will dare steal, and modern touch of the bicycle wheel for the bellows.

B. The edge of a Giriana smithy showing the accumulation of scrap iron.
A. Marachi shallow bowl-shaped hearth of type A1. It is left choked with ashes when the smiths finish work. Note the scrap iron in the background.

B. Marachi deep stone-lined bowl-shaped hearth of type A2. Note the stone anvils and hammers, the iron mandrel hammer, the double bowl bellows with their diaphragms and sticks removed for the night, and the tuyere of type C.
A. An Mbeere bowl-shaped hearth which is also a furnace. The smith is pouring a libation of honey beer to his ancestors before starting to smelt.

B. An Agricultural Pokot trench-shaped hearth. Note the small iron anvil of type B5 behind the stone one, the maul hammer beside it, and the spare tuyere to the left of the picture.
A Samburu trench-shaped hearth with the ashes raked to one side in a large heap. The smith's little daughter is blowing his bellows.
A. A Marachi smith using a mandrel hammer to make a spearhead. There is a second one in the foreground.

B. A Pokot cold-forging himself an arrowhead from a large nail by using any stones to hand as hammer and anvil.
A. Hammer of type B2. Its end may be squared-off like this, or rounded. They are confined to the westernmost Interlacustrine Bantu.

B. Tremendous exertion is involved in using a stone hammer. The smith has to stand upright and swing the hammer from way down between his splayed legs. Note the split green wood tongs.
Plate 14

A. A smith using a stone hammer swings it from down between his legs up over his head ....

B. and then down again to pound the red-hot iron on the downward stroke.
A. A Marachi smith smashes a large stone hammer onto red-hot iron on the largest anvil while the master smith holds it with iron tongs.

B. A Marachi master smith holds the red-hot iron in tongs on the anvil with one hand while he holds an iron rod, with which he points out exactly where the next blow must be struck, in the other.
A. Smiths using iron pounders use them with extraordinary skill. Here a Marakwt smith places a spearblade upright on its side in the groove of a tiny anvil of type B3, and taps it to true it.

B. When the spear edge has to be thinned, it is placed on the extreme edge of the anvil so that the mid-rib hangs over its side, and hammered with the heavier end of the maul which is roughened beforehand with a grinding stone.
PLATE 17

A. A Kikuyu smith using a short handled hammer sits down to forge a sword blade. Note the grooved anvils.

B. Single bowl bellows of type A2. The loose skin diaphragm is fastened both on the inside and the outside of the bowl.
A. Single bowl bellows of type A2 are always placed on the smith's left and pumped with his left hand. This Marakwet smith holds the nozzle firmly in position with his left foot. Note the twisted iron protective bracelet worn on his right arm.

B. Single bowl bellows of type A2b. These are very similar to type A2 but have smaller rounder bowls, and a very short nozzle cut in one with the bowl. Into it is fitted a crude wooden extension. This type is always used as a pair. They are placed close together in front of their operator who sits on a high stone with his legs splayed awkwardly on either side.
A. Triangular-shaped skin bag bellows of type BI with bifurcated wooden nozzle. This Kamba smith has buried his tuyere just below the ground.

B. Mbeere triangular-shaped bag bellows of type BI with bifurcated wooden nozzle extended by a piece of iron pipe.
A. The diaphragms of type AI double bowl bellows are removed when not in use. Here a Marachi smith ties them on before he starts work.

B. Giriama bag bellows of type B2 pumped by the smith's daughter. Hanging from the roof is a spare skin for the bellows.
A. The wives of Samburu smiths regularly pump their bellows.

B. The wives and daughters of Giriama smiths are taught to pump their bellows so that they can take over in the absence of the apprentice.
A. A Swahili smithy at Takaungu. The bag bellows are of type B2 made from a whole skin turned inside out. Note the long handled hammer, the square anvil set in a wooden base, and the fire shield.

B. A swahili smithy with cone-shaped tuyeres drying beside the hearth. The bellows are made from paper cement bags. The square anvil set in a wooden base has a hole through it. The trough for quenching water is of wood. Note the long handled hammer.
A. A Bajun smith rolls his clay into balls which are each sufficient to make one tuyere.

B. A Bajun smith moulds a tuyere around the long handle of his hammer.
A. The tuyere is pushed up and partially off the end of the stick in order to flare the funnel.

B. When only parts of the artefacts need to be heated in the later stages of forging they are held in temporary handles of wood or iron.
A. Rings are placed on mandrels for true-ing up, and a mandrel is used for making the holes for inlaying another material. Konso smith working for the Borana.

B. Konso smiths making facetted aluminium beads for the Borana and Gabbra insert a nail-like maul into a bead-sized cube and turn it rapidly on the anvil hammering in facets at each turn.
A. Kikuyu wire-drawer/chainsmith coiling trade wire for making simple link chain. He rolls the handle of the wire coiling tool on his thigh. Note the wire draw-plates, and the logs round which the lengthening chain is wound.

B. To make triangular cross-sectioned chain the coils are placed on the shallow top of a hard-wood pedestal spiked into the ground between the legs of the craftsman, and manipulated with two awls, into S-shaped links with their two cut ends lying in different planes.
A. To draw wire one man holds the drawplate against a forked or notched post while the other, holding the wire in a clamp, pulls it as he walks backwards.

B. A special tool is used by the Xamba to coil wire. It consists of an oblong of rhinoceros hide into which is fitted a long right-angled stick which serves as a handle, and a shorter one which wedges into position an upright wire and the wire to be coiled around it. By holding the upright wire in the left hand, using a small leather guard to protect the finger, and turning the handle in the right hand, one wire is spiralled around the other.
A. A zig-zag pattern is incised into an ornament by slightly wobbling an awl with a chisel-like tip in the hand.

B. A Giriama using a punch with grooved tip to decorate a heavy aluminium neck-ring.
A. Long narrow die used by Bajun smiths for decorating the aluminium bracelets that they make for the Orma. The tools for making it are above. By hammering it into this a whole bracelet can be ornamented in one effort.

B. Wire draw-plates and dies for decorating silver ornaments. Used by a Lamu silversmith.
A. Bracelets made for the Orma by Bajun smiths are ornamented by hammering them into long or short dies. When this short die is used the joins in the pattern of the bracelet are easy to see.

B. To make this type of die for ornamenting Orma bracelets Bajun smiths first make the positive dies at the top of the picture. They hammer them into the iron block at the bottom to form the die into which the bracelets are hammered.
A. Marachi smiths collecting ore in the Samia Hills. The master smith decided to dig into a bank which was obviously the edge of a previous excavation.

B. Ironsand washes out in stream beds after heavy rain. Here an Embu smith directs his apprentice to collect it. It is scooped up by hand, placed in a half gourd, and then emptied into a bag.
Ironsand is winnowed in an ordinary shallow flat-bottomed winnowing basket by an Embu smith's wife.
The ironsand is panned by placing it in a half gourd which is shaken while water is poured into it. This is usually done by men.
Simple bowl furnaces, rarely more than 30-35 cms in diameter and 20-30 cms deep, are frequently, though by no means always, clay lined.
A Marachi bowl furnace of type A3.
It consists of a clay-lined bowl in front of a low wall with a trench behind it. A hole connects the trench with the bottom of the bowl.
An Agricultural Pokot dome furnace of type BI. A circular wattle and clay daub structure roofed over and pumped by two or more single bowl bellows.
A. To make type BI bag bellows the smith cuts the skin into a triangle, folds it over, and stitches down one side. An awl is used to pierce the holes, which are then threaded through with fine goatskin thongs.

B. During an Embu smelt when things were going well the smith relaxed by drinking honey beer from a cowhorn.
When ironsand had been placed on a special grass on top of the red-hot charcoal in the Embu bowl furnace more charcoal, made from a different wood, was heaped right up over it and smelting began.
Embu smiths smelting ironsand place charcoal, from the cool periphery of the furnace, into its centre, cover it with a thick bundle of green grass previously made flexible by rubbing it in the hands to break the fibres, and place the ironsand on top so that it remains together and does not percolate downwards. Charcoal is then heaped up over the lot.
A. The material removed from a furnace is either a large spongy core consisting of a mass of coalesced iron, slag, charcoal, and unreduced ore, or a number of smaller pieces of the same matter. To extract the nodules of iron it has to be knocked to pieces with a hammer.

B. The blooms are always re-heated, in the hearth of the smithy, to refine, weld, and consolidate them. Sometimes the bottomless top half of a domestic cooking pot is placed in the hearth to hold the charcoal and iron blooms during this refining process.
A. The smiths consider that the bloom is ready to remove when typical long-tailed sparks are given off to the accompaniment of loud crackling noises.

B. When smelting the Mbeere use a flux in the form of ground-down Achatina or Limicolaria shell, the powder being placed on top of the ironsand in the furnace.
An Mbeere smith rubs a white diatomaceous powder on special places on his face, hands, and feet, as a precaution against possible sorcery from a jealous fellow smith.
I-4. The smiths collect soil from a termite chimney in an area of sandy soil.

5-II. They carry it back to the river which they cross to the smelting place.

I2-I8. Near the river they use sticks to topple another termite chimney of rich reddish clay, and carry it back to the smelting place.

I9. Water is brought from the river.

20-23. The soil from both termite mounds is tipped into the wattle structure of the furnace and broken up with a hammer. Water is added.
2. The soil is further broken up and mixed using a hoe.

3. More termite soil dumped outside the wattle structure is broken up and mixed with water.

4. One smith gets inside the structure to mix the clay by trampling it with his bare feet.

5-14. The clay, now mixed to the right consistency, is applied to the walls. The man inside applies the clay mixed inside to the inside walls, while those outside apply clay mixed outside to the outside. It is thrown at the walls and then pushed firmly home.

15-17. The walls are smeared smooth with hands constantly dipped in water.

18-20. Holes are made for the tuyeres.

21-23. The tuyeres are inserted, slightly countersunk, fixed in firmly with clay, and the surround smoothed off.

24. Three stout poles with forked tops are fixed in the ground close to the walls on either side of the furnace not occupied by tuyeres.

25-26. Ore is broken up and the furnace charged with alternate layers of charcoal and ore.

27-32. The roof is put on. Three stout sticks are laid horizontally over the open top of the structure with their ends resting in the forks of the uprights. On top of these, and at right angles to them, small thin sticks are packed close together and covered thickly with river grass and wet clay.
2. More river grass is stuffed in where wall and roof meet.
3. A knife is used to cut the protruding grass ends off flush with the wall.

4-6. The join between the top and the wall is sealed with clay.
7. The roof clay is smoothed.

8-10. The tuyeres are removed and a smouldering stick is thrust in through the holes to ignite the furnace. To get the fire going they blow into the holes by mouth.

II-20. The tuyeres are replaced and the bellows brought into play. At first their nozzles are placed almost in the mouths of the tuyeres.

21-23. Once the furnace is well established a considerable amount of flame and some ash is sucked back out through the tuyeres and the nozzles are moved further away from them.

24-27. When the smelting is over knives are used to dig the clay from the roof and from where the roof joins the walls.

28-29. When the lower cross beams are exposed they grasp them with their hands and tip the roof off to one side.

30-32. The smiths delve over the edge to remove the iron inside.
A. The making of an Agricultural Pokot furnace. Mixing the clay for the walls by treading it with the feet.

B. The man inside applies clay, from inside the structure, thickly to the inside walls, while men outside apply clay from an outside pile to the outside walls.
Agricultural Pokot furnace. Before putting on the roof the furnace is charged nearly half-full with alternate layers of charcoal and ore, placed on top of some dry grass and twigs.
A. Agricultural Pokot furnace.
Putting on the roof. Three stout horizontals with thin sticks closely packed over them at right angles, are covered with river grass and then clay.

B. Marachi smelting hut and furnace before the start of a smelt. The furnace trench extends beyond the hut circle.
Note that only the smiths are in the hut. Other male members of their families remain on the edge while the women stand well back.
A. Once the wall of a Marachi smelting furnace was built one smith dug the bowl of the furnace in front of the wall while another dug a trench behind it. A hole was then very carefully made under the wall to join the furnace bowl to the trench.

B. One and a quarter hours after lighting the furnace the hole to the trench became so choked with ash that it had to be poked clear. The ash was left in the trench.
A. Marachi furnace.
As soon as the charcoal began to glow a half sack full of ore was placed all round the outside of the charcoal but not on top of it. The darker charcoal can be seen in the centre. The ore extends slightly beyond the furnace wall.

B. When they think that iron is forming they probe around in the furnace for the cores and push them together into the hot centre. Sticks are used for this purpose.
A. When they had successfully produced iron the joyous singing and dancing of the smiths brought the women to the hut, and an all-black male goat was sacrificed in the hut to the right of the furnace. Its throat was cut with a sharp knife and the blood caught in a pot.

B. After smelting the smiths removed the slag from the cores and took them to the smithy for the second part of the operation. When the iron had formed into a lump it was alternately heated and hammered, using only heavy stone hammers, until it was formed into a long triangular-shaped ingot of the type used traditionally for trade.
An Isukha smith making a smiths twisted iron bracelet.

I. The smith measures his wrist with a piece of twine.

3-7. He heats and hammers the end of a wire into a square cross-section measuring it against the piece of twine.

8. When ready he measures it against the twine again.

9-10. He cuts off a bar of bracelet length with a hafted cold chisel.

12. He hammers the ends of the bar smooth.

13-18. Having heated the bar he holds each end in a pair of tongs and twists it. He holds the bar steady in his left hand while he twists it with his right.

19-22. He hammers the twisted bar to straighten it.

23-24. The bar is twisted again.

25. He hammers the bracelet terminals flat.

continued on Plate 53
I-8. The bracelet is bent into shape on top of the anvil using the tongs and a mandrel.

10. Holding it down on the anvil with the mandrel he hammers out any curves so that it lies in one plane.

II-15. Holding it in his left hand with one pair of tongs he bends the terminals back onto the outside of the bracelet using the second pair of tongs.

16. Placing it flat on the anvil he completes it by hammering the terminals so that they do not extend beyond the width of the bracelet.

18. He tries to fit the bracelet on himself.

19. Finding that the opening isn't wide enough for it to go on his wrist he uses the tongs to open it up a bit.

20-24. The bracelet is fitted on his wrist.
A. To twist the iron bracelet which is the insignia of his craft an Isukha smith holds both ends of a square cross-sectioned red-hot iron bar in tongs and twists it with his right hand while he holds it steady in his left.

B. An Isukha smith bends back the terminals of the twisted iron bracelet which is the insignia of his craft.
A. Many smiths make one or more loops in twisted iron bracelets and neck-rings. To do so they often haft one end of the ornament temporarily. Note the irregular twisting as a result of re-heating.

B. To curse an Mberre smith pours honey beer through the loops of a circumcision knife.
A. An Embu smith hammers out a triangular-shaped razor. The iron dust and flakes left on the anvil after forging are very potent magic.

B. A Marachi smith burning a red-hot slasher blade into its haft. Note the use of the split green wood tongs.
PLATE 57

Hafting a slasher.

1-2. To pierce the hole in the haft for the insertion of the tang a large awl heated red-hot is held upright on the anvil while the haft is forced down onto it.

3-6. It is removed, reheated, and applied again while the haft is held horizontally.

7-8. The slasher tang is tried for fit.

9-10. The slasher is heated red-hot and its handle is forced down onto it. The slasher head is then removed.

11-17. The heated slasher tang is again forced into its handle and then removed.

18-21. The same process is repeated.

22-24. It is repeated again.

25. Some tree gum is dropped into the tang-hole.

26. Additional tree gum is ground on the anvil.

27-29. This gum is also placed in the tang-hole and rammed home using the slasher tang which is still hot.

30-31. The tang is re-heated and forced into its haft. This causes the gum to bubble out all round. After this the slasher is upturned, jumped on the anvil, and hammered home by hitting the end of its handle.
1-4. A Kamba smith tries the blade of a blade-tipped digging stick in its haft.

5. He hammers the tang of the blade to a better shape.

6-13. He heats the tang and burns it in to the end of the stick. He later pulls it out again.

14-17. Since an end-hafted digging stick is liable to split where the tang is burned in he makes an iron band to fit around it.

18-21. He curves the band.

22-25. He heats it and fits it onto the stick.

26-30. He burns the red-hot tang into the haft for the final time.
A. Kamba smith making and hafting an axe-head.
I-5. Finishing off the axe-head. Note that the tip of the tang is slightly bent over.

6-9. A red-hot awl is hammered into the haft to make the tang-hole.

10-12. The blade is tried in its haft.

13. The axe blade is sharpened, and is later burned into the haft permanently.

B. I-3. Giriama smith hammering a red-hot spiked tool into a haft to make the hole for the insertion of a hoe-blade.

C. I-4. Giriama smith hammering a mandrel into a new hammer head to make the haft-hole. He is hammering it over the edge of the wooden block into which the anvil is set.

5. The protruding metal on the reverse side is about to be hammered flat.
A. A Giriama apprentice carves a hoe-haft using a knife. Smiths rarely supply handles for hoes but do in this instance because the tanged hoe-head is burned into its handle and then hammered back onto it.

B. A Konso smith making a sheath for a sword-stick for the Borana. Lying a strip of wet skin across his knees and placing the weapon, between its two wooden slats, on it, he starts stitching at the base of the blade. Stitching is done with an awl. As he proceeds the slats have to be held together by an assistant.
A. An El Molo using a donkey dung fire to heat-forge a crude knife. El Molo men are the only non-smiths who regularly heat-forge iron but they never use bellows, charcoal, or traditional smith's tools.

B. Aluminium is cast into a groove in the ground. The residue, which resembles dirty silver paper, is quickly scooped out.
A. A Masai woman fitting on a wire leg-coil. Wire is a favourite form of ornament. Heavy gauge wire is wound around necks, arms, and legs.

B. Konso smiths decorate aluminium rings for the Borana with plastic from ball-point pens, old sandals, buckets etc. The ring is heated, and a small piece of plastic dropped onto the prepared hollow is then pushed in with a small chisel.
A. Kikuyu simple link chainmaking.
When one wire has been coiled around another they are placed on a stone and held firmly between the feet while a longitudinal cut is made, with a chisel, down the length of the coiled wire. This produces circular links which have one end slightly higher than the other.

B. The unclosed links are hooked together, placed opening uppermost over the edge of a stone, and hit with a suitable piece of iron to close them and make them oval.
Kamba wire-drawer/chainsmith making triangular cross-sectioned chain.

I-4. Coiling the wire using the special tool.

5-6. The coiled wire is cut.

7-9. An awl is used to prise two coils at a time from the end of the coil of wire. They are placed on a hard-wood pedestal spiked into the ground between the knees of the craftsman.

10-14. Two awls are used to manipulate the coils into a series of S-shaped links with their two ends lying in different planes.

15-20. Pincers are used to pick up each link and to join it to the previous one. The links are then squeezed together tightly with the pincers to close them.
Kamba ornament maker casting aluminium.

I-9. He hammers an old aluminium cooking pot up into a small compact lump.

10. Places it in a small tin can.

II. Puts it on a log fire.

I2-I7. Cuts up more logs and covers the tin with them entirely.

I8-20. The fire is fanned with a piece of scrap tin. Ornament makers cannot use bellows.

21-26. In 10-15 minutes the aluminium is molten. The tin is removed from the fire and the contents poured into a groove in the ground.

27. The residue, which resembles dirty silver paper, is quickly scooped out of the groove.

28. The tools used. Note that an ornament maker cannot use a smiths traditional hammer. These are chainmakers pincers, not smiths tongs.

continued on Plate 66......
A. I. The aluminium in its groove.

2. The residue scooped out beside the groove.

3-4. The resultant solidified bar.

B. I. Kamba knife with its aluminium sheath which is to be decorated.

2. The ornament maker sharpens a knife tip by hammering it.

3-I2. He incises the sheath with zig-zag geometric patterns by gently wobbling the knife tip in his hand.
A. Bajun smiths pour molten aluminium into a piece of scrap angle iron as they say that it is an improvement on their former method of pouring it into a groove in the ground.

B. For making bracelets the resultant bar is placed on the anvil and flattened by being hammered alternately by the smith and his apprentice.
A. A Bajun smith decorates a bracelet for Orma women by hammering half of it at a time into a small rectangular die which rests on top of the round anvil.

B. When the bracelet has been decorated and holes punched in each end for rivetting it together it is placed on a block of wood and curved to shape using a delicate hammer.
A. Having rivetted the bracelet a Bajun smith places it on a large wooden mandrel and taps it gently to true its shape.

B. Kamba spiked earring from the Kikumbuliu area. Made in a two-piece clay mould. These earrings are similar to those made by the Giriama in one-piece clay moulds.
The clay mould is placed upright in a small hole in the ground.

Hot charcoal is placed on it to heat it in case it cracks.

The aluminium is heated in a bit of tin. It has hot charcoal placed on top of it.

The molten metal is poured into the mould and allowed to set.

The mould is removed from the ground.

A hammer is used to break the mould away from the casting.

continued on Plate 71...
I-5. The mould is broken away from the casting.

6. The remains of the mould.

7-8. The resultant casting.

9. The smith showing an anvil that belonged to his grandfather.

10-II. The casting is placed on the anvil while the back portion, which protrudes through the ear, is trimmed with a chisel.

12-18. It is then placed on the extreme edge of the anvil, and on the wooden base of the anvil, for its back and front to be hammered and filed.

19. The front is formed into a square cross-sectioned point.

20. A coarse flat file is sharpened with a triangular file.

21. The back is filed again.

continued on Plate 72
I-5. The back of the earring is filed.

6-9. It has its back cut off with a chisel.

10-14. The point is put through a small hole in a flat iron bar while the back is hammered into its final shape.

15-17. The earring is placed spike uppermost into a hole in a log of wood while its front is worked to a saucer-shape using a delicate hammer.

18-20. It is removed to the anvil where it is further dished, and its point is hammered round in cross-section.

21-22. It is returned to the wooden block for further work.

continued on Plate 73....
The earring in the wooden block being delicately worked by the pointed end of a light hammer.

It is returned to the metal bar with the hole in it for further work to its back.

The finishing process begins. The earring is filed smooth. During this process it is placed on top of a large peg-shaped wooden tool held upright between the smith's knees.

Scraping the saucer-shape deeper with a knife.

A little coconut oil from a bottle is poured into the saucer.

Ash is placed into it.

The saucer-shape and spike are polished with the oil and ash using a rag.

A final scraping of the edge of the saucer using a knife.

The finished earring.
A. When making earrings in the form of a simple round cross-sectioned bar Kamba ornament makers place a thick clay mould, with a narrow central hole, directly onto the ground and pour the molten metal into it.

B. The molten metal splays out a little on the underside and has to be cut off later.
A. Kamba ornament makers use two-piece clay moulds to make spiked earrings. The two halves are sealed together with wet clay and the molten metal is poured in through a hole in the top half.

B. When the metal has set the two halves are taken apart after removing the sealing clay.
A. An awl is used to push the aluminium casting out of the top mould.

B. The earring is held against the edge of a stone while its rim is trimmed off with a chisel.
PLATE 77
Kamba ornament making using one-piece and two-piece clay moulds.

1-3. The ornament maker digs the clay himself using a wooden stick.

4. He works in the compound of his homestead.

5-14. He mixes the clay with water on a flat rock pounding it with a wooden roller.

15-21. He makes the two halves of the clay mould by forming them in his hands. He uses water to wet them as he works.

22-23. Using a stick he makes a hole through one mould.

24. He places the mould with the hole over the one without the hole.

continued on Plate 78.....
1. The wet clay mould with hole pierced through the top one.

2. The stick is pushed through the top mould into the lower one.

3. The wet lower mould is placed over an old dry lower mould.

4-6. This leaves the indented impression of the old mould on the new one.

7-9. The smith scoops out the impression on the wet mould using a stick.

10. Wood is cut up for the fire.

11. Charcoal to start the fire is brought from the domestic hearth.

12-15. The ornament maker pours a libation of honey beer to his ancestors, and drinks some himself.

16-18. The fire is started with the hot charcoal.

19-20. The ground is moistened where the mould will stand.

21-22. The two halves of the clay mould are put together and the holes lined up by poking the stick through them. The join is then sealed round with wet clay.

continued on Plate 79...........
1-5. The molten aluminium in a bit of bent tin, is removed from the fire and poured in through the hole in the top of the mould. Forceps are used to remove extra material adhering to the top.

6-7. The two halves of the mould are pulled apart.

9. The earring casting is pushed out from the top of the mould using an awl.

10-11. The ornament maker prepares a one-piece clay mould for a simple bar earring by drilling a hole through it with an awl.

12-19. He makes the second earring in the two-piece clay mould.

20-21. He enlarges the hole in the single clay mould with a stick.

continued on Plate 80......
I. He enlarges the hole in the single dry clay mould.

2. He removes the second earring from the double clay mould.

3-5. He places the single clay mould on the ground and pours in the molten aluminium.

6-9. When it has set he removes the mould from the ground.

10-13. The resultant casting is placed on a piece of old railway line and has the necessary metal cut off with a chisel.

14-16. The simple bar earring is hammered and filed to shape.

17-18. The earring cast from the two-piece clay mould has its back cut off.

20-24. It is placed point downwards into a block of wood with a hole in it, while its back is worked

continued on Plate 81.....
The point of the earring is hammered to shape on the edge of the anvil.

The earring is placed on the edge of a flat stone while the rim of its saucer-shaped centre is trimmed by cutting it with a chisel.

The saucer-shape is gently hammered.

The earring is finished off by filing. A wood block is used in this process.

The earring is polished with a piece of shop-bought sand-paper.

The finished earring
A. Konso smiths casting a phallic ornament for the Borana by the cire perdue method.
The ornament is carefully carved in wax using a modern razor blade.

B. The whole ornament is plastered over, to a depth of just over a cm., with a clay and grass mixture. The clay covering the tip of the ornament is scraped off flat and a funnel hole is made into it through which the molten metal is poured.
A. The clay mould with wax centre is placed on the red-hot charcoal of the fire, hole downwards, so that the wax melts and gradually drips out.

B. The mould is broken off and the aluminium phallic ornament emerges.
A Wanga smith selling his wares in a local market. In the photograph, beside the commercially produced hoes which have had new blades rivetted on them by the smith, there are slashers, knives, cowbells, spear-heads, protective iron bracelets, iron pipe-stems for clay pipes, an axe, and a traditional hoe.

Only amongst the Luyia group is such a variety of iron goods to be found in a market.
A wire-drawer and chainmaker in a local Meru market makes chain while he displays his wares.
Figures I-4 are of smithy plans showing internal space arrangements, and distribution of artefacts and refuse.

**Top**
Isukha smithy of rectangular type with a pitched roof.

**Centre**
Swahili smithy of rectangular type with a pitched roof.

**Bottom**
Kikuyu smithy; a modern, almost square version, of the rondavel type.

The numbers on these plans are as follows:
1. Stone and iron anvils.
2. Wooden blocks.
Hammers and tongs are obvious.
Top
Marachi smithy of rondavel type.
Note the bank of soil round the perimeter.
The numbers on this plan are as follows:-

1. Stone and iron anvils.
2. Stone and iron hammers.
3. Wooden block with holes.
4. Horn for "blue-ing" blades.
5. Clay pits for collecting clay for tuyere joints.

Bottom
Swahili smithy of rectangular type with pitched roof.
The numbers on this plan are as follows:-

1. Stone and iron anvils.
2. Seat.
Top
Pokot smithy of rondavel type with trench hearth.

Bottom
Samburu brushwood smithy with trench hearth.

The numbers on these plans are as follows:—
1. Stone and iron anvils.
2. Maul hammers.
Top
Mbeere brushwood smithy with bowl hearth.

Bottom
Marakwet rock shelter smithy with bowl hearth backed by stones.

The numbers on these plans are as follows:-
1. Stone and iron anvils.
2. Hammers.
3. Finished products.
4. Horn for honey beer.
5. Seat.
7. Notched block against which spears are leaned for sharpening.
8. The rock which shelters the smithy.
I. Triangular shaped stone hammer of type A2 with trimmed wedge-shaped end.

2. Heavy sledge hammer of type A1 with slightly convex striking ends.

3. Lighter version of No. 1.

4. Small oval hammer stone.
1. Samburu maul hammer of type B1a round in cross-section at narrower end, and rectangular in cross-section at heavier end.

2. Marakwet maul hammer of type B1a similar in cross-section to No. 1.


4. Marachi tanged hammer of type B2. It can have a rounded end as well as this squared-off type of end.
FIGURE 7

1. Embu hammer of a type which falls halfway between types CIa and CIb. It has the haft-hole nearer the lighter end of the head.

2. Mbeere hammer of type CI with its haft held in position by wedges.

3. Mbeere hammer of type CI with its haft-hole almost centrally placed.

4. Mbeere hammer of type CI with its haft-hole towards the heavier end.

2. Konso smiths copy of a European hammer.


4. Kamba hammer of type C1a. A longer handled and somewhat square cross-sectioned version of type C1.

5. Kamba hammer of type C1a. As above.
FIGURE 9

1. Hammer of type C1b peculiar to the Kikuyu. The short handle fits into a hole closer to the pointed end. This hole does not penetrate through the head which is strengthened at this point by thickening the metal into a marked ridge which goes over its top and round its sides.

2. As above.


4. Mbeere hafted cold chisel. The branch is split for the insertion of the chisel.

5. Marachi hafted cold chisel. A hole is made in the haft and the chisel wedged in.
The hammers of one Giriama smith.
No. I is used for delicate work particularly on jewelry.
No. 5 is used as a sledge hammer.
1. Giriama hammer used for delicate work, particularly jewelry making.

2. Digo hammer.

3. Digo hammer.

4. Swahili hammer.

5. Bajun smith's sledge hammer which is grasped with both hands.

I. Iron anvil of a type never seen before. Used by a Marachi smith.

2. A piece of railway line is commonly used as an anvil.

3. This old engine block was used as an anvil by a Kamba smith.

4. Rectangular iron anvil of type B1c. This type, usually without holes, is used mostly by the southernmost Coastal Bantu, but this belonged to a Swahili smith at Takaungu.
I. Kikuyu stone anvil of type A2b with a V-shaped groove used for making mid-ribs of spear, sword, and knife blades.

2. Isukha stone anvil of type A3, carefully shaped, bevelled round the edge, and set deeply in the ground.

3. Marachi shallow variation of the above which may just rest on the ground.
I. Round iron anvil of type B1b set into a heavy log of wood sunk flush with the ground. This type is used by the coastal peoples and the Cushitic pastoralists of the north-east.

2. Anvil used by Konso smith working for the Borana. Type B1a.

3. Marachi small iron anvil of type B3.


5. Marachi small iron anvil of type B3.

6. Digo anvil of type B1c.


8. Unusual Kamba iron anvil 4" long x 2" wide set in a square block of wood not sunk flush with the ground. Probably copied from the coast.

FIGURE 15

1. Marachi anvil of scrap iron.

2. Swahili grooved iron anvil.

3. Marakwet grooved stone anvil.

4. Marakwet notched wooden block against which spear-blades are rested for sharpening.

5. Marachi wooden block with a hollow used particularly for making iron ornaments.

6. Marachi iron with holes in it. Used for bending tips of things.
I. Double bowl bellows of type AI. To pump them a vertical stick is pushed through a hole in the centre of the diaphragm and secured to it on the underside, but this makes the bellows valve-less. They are pumped alternately and usually weighted down with a stone.

2. Plan of the same bellows which are carved from a single log. The two round bowls are joined at the base. A single nozzle, containing two separate air passages, bifurcate off to each bowl.
Bellows blowers always stand to pump double bowl bellows of type AI. The long sticks are pumped alternately.
Double bowl bellows of type AI are usually weighted down with a heavy rock to prevent them shifting during use.
I. Turkana single bowl bellows of type A3 cut in one with its short thick nozzle into which is placed a nozzle extension consisting of a long narrow pipe of iron. No tuyere is used. Its valve-less skin diaphragm comes to a peak in the centre and is attached to the rim of the bowl with nails. The bellows are pumped by holding the peak of the diaphragm in the left hand.

2. Masai single bowl bellows of type A2. The bowl and nozzle are carved in one piece. The nozzle is sheathed with the tail or legskin of an ox which protrudes over the end so that a detachable slightly curved clay or wooden tip can be fitted into it. The loose skin diaphragm is fitted on the outside of the bowl, and has a small aperture in its centre which acts as a valve. Only one bellows is used and pumped with the left hand.
To suck air into the single bowl bellows of type A2 the blower inserts his thumb into the aperture to pull up the diaphragm. To blow the air out he depresses the diaphragm opening his hand as he does so to cover the hole so that no air escapes.
FIGURE 2I

1. Kikuyu triangular bag bellows of BI type with wooden nozzle.

2. Taita triangular bag bellows of BI type with iron pipe nozzle.
Triangular-shaped bag bellows of type BI always have the hair on the outside. The base of the triangle is an open slit which forms the air aperture. This slit is edged with two slats of wood held in the hands of the operator by means of leather thongs. The thong on one side is long enough for the insertion of all the fingers, and on the other for the thumb only. By opening his hand the operator opens the lips of the air aperture so letting in air, and by closing the hand quickly, while at the same time pressing the two lips together and gradually pressing down and collapsing the bag, the air is driven out.
I. Bag bellows of type B2 which consist of a whole animal skin turned inside out. The pair are never joined by a bifurcated nozzle, nor are their apertures ever sewn up. These were used by Konso smiths working for the Borana, but in their homeland I have seen them using a large square bag bellows.

2. Mbeere triangular bag bellows of type BI with bifurcated nozzle and aperture partly stitched up to prevent the escape of air and provide a more efficient blast.
I. The nozzles of bag bellows may sometimes be weighted down with a stone. These are Konso/Borana bellows of type B2.

2. Bifurcated nozzles of type BI bag bellows are fixed firmly to the ground by uprights of stick or metal which are placed on either side of them so that cross-bars of wood or metal can be jammed over them.

3. A lazy smith sometimes keeps his bag bellows nozzle in place with a pair of tongs.

4. A common method of fixing the nozzles firmly to the ground is to use a forked stick.
1. Long straight clay "pipe" tuyere slightly incurved at both ends. Two or three of these are joined together by thick rounded humps of clay. They are never used singly. They are confined to an area close to the Uganda border.

2. A funnel-shaped tuyere which is the most widespread type.

3. A cone-shaped tuyere used by the Swahili speaking peoples of the coast.

4. An oval cross-sectioned variation of a funnel-shaped tuyere. This was used by a Tharaka smith.
I. Light weight Mbeere tongs of type BI with wide jaws which meet only at the mouth for about a fifth to a quarter of their length.

2. Mbeere heavy weight tongs of the same type.

3. Wanga light weight tongs of type BI with one handle much shorter than the other.

4. Wanga heavy weight tongs of type B2 which meet only at the mouth.
1. Kamba tongs of type BI with jaws which meet only at the mouth for a fifth to a quarter of their length.

2. As above.

3. Konso tongs of type BI.

4. Konso tongs of type BI.

5. Isukha tongs of type B2 which meet only at the mouth.
I-2. Giriama smiths tongs.

3. Mbeere smiths tongs.

4-7. Bajun and Giriama smiths tongs.

8. Digo tongs.
1. Marachi tongs of type A. Made from a branch of split green wood.

2. Tongs of type C. Waisted forceps type which have the appearance of sugar tongs.

3. Tongs of type C. Simple forceps type made by simply bending over a piece of flexible metal strip.

4. The same as No. 3. Forceps type tongs are commonly used by ornament makers who are not allowed to use smith's tongs.
FIGURE 30

1. Mbeere smiths long chisel. Round in cross-section.

2. Mbeere smiths chisel.

3. Flanged chisel.

4. Chisel flattened back and front and slightly flanged.

5. As above.


8. Mbeere smiths chisel.
I. Marachi smiths mandrel.

2. Isukha smiths mandrel.

3. Samburu smiths mandrel.

4. Konso smiths small mandrel inserted into an aluminium bead while it is faceted.

5. Mandrel hammer of type B1b. Used by Marachi smiths for more delicate finishing work. Either end may be used, and it is usually held vertically.

6. As above but to show that the side can also be used for striking.
I. For the second part of the smelting process Embu smiths place the broken top-half of a domestic cooking pot rim downwards into the furnace hollow. Three U-shaped notches are cut into what was the belly of the pot to allow for the entry of three tuyeres.

2. Spike of scrap iron used for making holes.

3. Tiny holes, such as those pierced through small bells, are made with a short blunt-nosed awl.

4. Occasionally a tool for incising a pattern into non-ferrous metals resembles an engraving tool but it is usually only used as a tracer.

5. Sometimes the awl used for incising a pattern is splay-ended. This type is also used for boring the hole in an arrow-shaft for the insertion of the arrow-head.

6. A smith's awl used for a variety of purposes including incising patterns.
I. Marachi metal socket, perhaps more correctly described as a flanged bar, used to hold a tool in the later stages of forging when only part of the artefact is heated at a time.

2. Temporary pointed handle of wood used in socketed tools in the later stages of forging.

3. Temporary pointed handle of wood used on a rare flanged slasher in the later stages of forging.

4. Marachi metal flanged bar to hold a tool in the later stages of forging. It is itself set in a wooden handle.

5. Piece of split branch used as a handle in the later stages of forging.
I. Lamu silversmith's dapping die of brass for making bosses in silverwork.

2. Ground plan and cross-sectional elevation of a reconstruction of an extinct type of Keiyo furnace. After Galloway.

3:2a Rake. An unhafted iron bar flattened at its working end.

4. Rake. Unhafted slim iron bar bent at one end and curled over to form a handle at the other.

5. Marachi iron pointer burned into a short wooden handle. These are only used by smiths who pound their red-hot iron with heavy stone hammers.
I. Swahili smiths wooden trough for holding quenching water.

2. Kamba ornament makers wooden block and roller cum mallet.
I. Mbeere brush of millet used for sprinkling on water to dampen down and contain the fire.

2. Marachi brush of fibre used for the same purpose.

3. Hammer, discarded tuyere, and tongs with one arm through the tuyere. Mbeere smiths carry them thus when cursing to protect a field of crops.


4. Kikuyu wire coiler used by chainsmiths for producing simple link chain.

5. The simple link chain of the Kikuyu.
1. A forked or notched post set firmly in the ground is used for drawing wire. The clamp holding the wire may be held against the fork while the draw-plate itself is pulled using the post as a lever so that the drawn wire is wound around it.

2. Or the drawplate may be held against the forked post so that the wire is drawn through the fork.

3. It may then be pulled through the notch of a second post some distance away, and wound directly onto a right-angled coiler.
Wire drawing method used by a Lamu silversmith. The wire is pulled through the drawplate by a pair of pincers attached to a wooden upright which is worked along the plank step by step. This work was done by his daughter.
I. Kamba chainmakers tool for coiling wire. It consists of an oblong of rhinoceros hide into which is fitted a long right-angled stick which serves as a handle, and a shorter one which wedges into position an upright wire and the wire to be coiled around it. By holding the upright wire in the left hand, using a small leather guard to protect the finger, and turning the handle in the right hand, one wire is spiralled around the other.

2. A hard-wood pedestal with a spiked base which is stuck in the ground between the craftsmans legs. The chain links are worked on it.

3. Two long handled awls of this type are used to shape the links on the pedestal.

4. The special chainmakers pincers which are usually fitted with an oblique groove to enable the links to be held securely.

5. The triangular cross-sectioned chain composed of S-shaped links which is produced with these tools.
1. Waisted forceps tongs used by Giriama smiths when making jewelry.

2. A one-piece clay mould used for casting a spiked Giriama earring.

3. The block of wood in which the earring is placed spike uppermost while its front is worked into a saucer shape.

4. The earring which is produced using these tools.
1. Kamba two-piece clay mould for making earring No. 3. An iron ring is placed between the two moulds to form the groove at the back of the earring with which it is held in the hole in the lobe of the ear.

2. The casting produced by No. 1.

3. The finished earring.

4. Another type of earring made by the same method.

5-7. Awls used in decorating ornaments.
FIGURE 43

1. Kamba one-piece clay mould used for making a young man's head ornament.

2. The casting produced from the above mould.

3. Wooden block used for working earrings and head ornaments.

4. The young man's ceremonial head ornament produced by No. 1 mould. A feather is stuck in the hole in its top and it is gummed to the head.

5. Small wire tool used in mould No. 1 to make the hole in the head ornament.


7. The casting produced from the above mould.
FIGURE 44

Method used by Bajun smiths to make decorated bracelets for the Orma.

I. A file with deep jagged teeth is used by these smiths to make positive dies.

2-3. The positive dies made by hammering No.1 into a piece of shop-bought file which has previously been hammered smooth.

4. The small rectangular iron block into which Nos. 2 and 3 are hammered to produce a negative die.

5. The cast bar of aluminium is hammered flat and cut into strips the length and width of a bracelet.

6-7. Two bracelets half-decorated by being hammered into a small rectangular die.

8. A bracelet which has yet to be rivetted.

9. A long narrow die used to decorate a bracelet in one effort.

10-11. The tools used to make the above.
FIGURE 45

The strange high peg-shaped tool of a Giriama smith on which he rests ornaments whilst putting the finishing touches to them. It just rests on the ground.
FIGURE 46

I. Plan and section of type AI round bowl furnace, the most common type in Kenya which is found throughout northern and eastern Kenya east of the Rift Valley. Draught is provided by 1-4 pairs of bag bellows. This Embu one is clay-lined.

2. Plan and section of type A2 bowl furnace, a clay-lined oval with a thick clay rim, which seems to have been peculiar to the Kikuyu. Two pairs of bellows, set at either end of the oval, provide the draught.

3. Section through an Mbeere bowl furnace of type AI which is not clay-lined.
Plan and section of a Marachi smelting furnace of type A3. It consists of a clay-lined bowl in front of a low wall with a trench behind it. A hole under the wall connects the trench with the bottom of the bowl. The tuyere, of type C, consists of three sections of straight clay pipe joined together by thick rounded humps of clay. Draught is provided by double bowl bellows of type AI.
1. Section through a Pokot dome furnace.

2. Marachi smith's bellows, tuyere, and stone-lined hearth.
I. Discarded mild steel reinforcing rods are used by a Kikuyu smith for making Masai spears.

2. The rod is thickened at the end by jumping it upright on the anvil.

3-5. The thickened rod is repeatedly heated and hammered to flatten it into a fan-shape.

6. Once the socket is roughed out a tapered mandrel is inserted so that the socket can be closely hammered around it to bring its edges together in a straight line.

7. The socket is flared gracefully into the rod

continued on Figure 50....
I. The smith then beats the rest of the bar, bit by bit, starting above the socket, into a rectangular cross-section.

2-3. Then using a grooved anvil of stone or iron the smith places the bar over the groove and hammers it just off-centre with the utmost precision, so that its underside sinks into the groove while its upperside is thinned only along its edge. This produces a mid-rib on both sides.

4. For smoothing out the hammer marks along the mid-ribs and for removing the slight wavering of the cutting edges the smith invariably uses a maul hammer if he has one.

5. The blade is narrowed slightly to within 5 cms. of the socket when the ends are splayed out to form the base.

6. Immediately above the socket a Masai spear butt is fullerated to produce a small waist.
Making a slasher from a worn-out commercially produced haft-hole hoe.

1-2. Using a long narrow chisel the blade of the hoe is cut off on both sides leaving the mid-rib which becomes the tang of the slasher. The stub or heel of the hoe is then cut off using a short wide chisel.

3. The long narrow chisel is used again to hot-cut through the wall of the hoe-haft.

4. The haft-hole is gradually opened out.

5. After more heating and hammering the shoulder is hammered out and the whole thing roughly straightened.

6. The cutting edge is then thinned and the back of the blade hammered to an even thickness of \( \frac{3}{4} \) cm.

7. The thinning continues from the tang to the dotted line. The diagonal dents thin the blade still more.

8. The end, beyond the dotted line, is left \( \frac{3}{4} \) cm. thick.

9. The smith then starts to form the curved tip of the slasher. To do this he works on a stone anvil in which there is a hollow.

continued on Figure 52...
I. The smith inserts the slasher tang into a rough wooden handle, heats the slasher, and raps its end against the anvil to increase the curve.

2. When the curve is sufficient the end beyond the dotted line is thinned by drawing it with the hammer. This dishes the inner curve from the spine to the inner edge and removes the radius in the neck.

3. Finishing touches are made to the tip whilst holding it at different angles on the iron anvil.

4. The blade is then upturned on the anvil and rapped smartly at several points.

5. This gives it the desired reverse curve. It is then removed from its temporary handle before fitting it with a handle and sharpening it.
I. Luo razor.

2. Kikuyu razor.

3. Ogiek Dorobo razor.


5. Kamba tweezers.

6. Mbeere women's eyelash pluckers.


8. Pokot tweezers.

9. Kamba tweezers of unusual design.
I. Knife used to smooth the wax image when casting a phallic ornament by the cire perdue process.

2. Method of making the wax image for the more elaborate form of phallic ornament.

3. The completed wax image.

4. The wax image is covered with clay leaving the basal loop uncovered. A small sausage of clay is placed through the wax loop, and the whole thing is then completely covered over with clay.

5. The more elaborate aluminium ornament and its base plate.

6. The simple type of aluminium phallic ornament and its base plate.
1. Turkana and Pokot womans belt of beads and aluminium bars which are cold-forged by the women themselves.

2. Turkana and Pokot ring of iron, brass, or copper, worn by both sexes. Made from trade wire which is hammered flat with a stone and then coiled.

3. Turkana and Pokot womans belt of iron, brass, aluminium, or copper beads which a man cold forges for them or they cold-forge for themselves. The spacers are of cowhide.

4. An Upper Pokomo aluminium bracelet, before it is curved to shape, showing the zigzag geometric decoration obtained by slightly wobbling a knife or awl to and fro in the hand as the design is traced.
I-6. Pokot cold-forged aluminium lip-plugs worn by both sexes.

7. Pokot and Turkana aluminium nose ornament.

8,9,11,13. Pokot elders aluminium earrings.

10. Masai-type elders earring usually of copper.

12. Aluminium earring of senior sets of the present Pokot junior generation.
1. Giriama heavy aluminium necklet made by a smith who first cast the metal into a groove in the ground.

2. Pokot heavy aluminium bracelet made by a smith who first cast the metal into a groove in the ground.

3. Kamba aluminium ceremonial staff made by first casting the metal into a groove in the ground. Decoration by incising zigzag geometric patterns, and by inlaying circles of brass.

4. Pokot and Turkana mens bracelet of iron wire coiled round with aluminium wire. Made by the wearers.
Different types of Kenya spears.

1. Delicate throwing spear used by the Turkana, Pokot, Rendille, Samburu, Tugen, Njemp, Marakwet, and Keiyo in north-east Kenya.

3, 6, 8. are Masai-type spears used by several groups. No. 8 is a Kipsigis one.

7, & 9. are fish spears from Lake Victoria.
FIGURE 59

1. Nandi spear.


4. As above.

5. El Molo harpoon.

6. Turkana harpoon.

7. Turkana harpoon.

8. Turkana harpoon.


10. Ogiek Dorobo fore-shafted elephant spear. Also used by some Mt. Elgon tribes.
I. Borana Galla spear with high and very narrow mid-rib which does not reach the tip. Typical angular 10 sided socket which is usually closed or almost closed.

2. Orma Galla flat-bladed egg-shaped spear. The "blue'd" central portion is typical of these spears.

3. Flat-bladed Galla spear of the type called Ebo.


5. Borana spear.
FIGURE 61


2. Kikuyu elder's sword blade.


5. Kuria spear.

I. Stopped bleeding arrow used throughout Kenya. Larger ones are shot into the jugular vein of cattle and camels. Smaller ones are used to make a cut above the eyes of sheep and goats.

2-4,9. Simple arrows made by hunters themselves.

5-8. Arrows made by smiths.

10. Somali arrow.
1-3. Stages in the making of a Tharaka arrow-head. Note that the tang is made first and then hafted.

5-9. Different shapes of simple flat arrowheads.

10. Ogee cross-sectioned arrow-head with detachable fore-shaft.

4,II. Arrowheads with slight mid-ribs.
FIGURE 64

I. Traditional Luyia knife.

2. As above.

3. Mbeere knife.

4. Luo knife.

5. Kikuyu knife.


8. Meru knife.
I-2. Luyia knives for harvesting bananas or heads of grain.

3. Sickle.

4. Sickle.

5. Woodworking tool.


7. Kamba blade-tipped digging "stick". See also plate 58.
1. Samburu castrating iron.

2. Masai branding iron.

3. El Molo knife.


5. Skin scraper.

6. Skin scraper.

7. Tool for digging holes.
I. Pokot mans finger-ring knife. A general purpose knife.

2. Mbeere circumcision knife. The pen-knife shaped blade at one end is for circumcising boys, while the blade at the other end is for circumcising girls. The number of loops indicate which daughter is being circumcised, or if a son and a daughter are being circumcised together.

3. Pokot dentists tool for removing teeth.

4. Pokot circumcision knife.

5. Turkana wrist-knife with leather guard. A general purpose knife.
Different types of hoes produced by a Taita smith for different purposes. Nos. 2 and 4 show methods of hafting.
I. Luyia hoe.

2. Kisa hoe.

3. Nandi hoe.

4. Tiriki hoe. The tang is used for digging up sweet potatoes.

5. Wanga repair to commercially-produced hoe.

FIGURE 70

1. Luyia hoe for weeding closely planted crops. It is also fixed to a long straight handle and used for cooking sour dough.

2. Luyia hoe.

3. Luyia hoe-blade used in the same way as No.1.


5. Idakho disc sharpened all round the edge. It is hurled at enemies.


7. Pokomo hoe. The head is kept in place by rings of the shell of a fruit.
The different types of slasher and slasher haft found in western Kenya. They are the typical tool of the Interlacustrine Bantu, are also used by the Luo, and, to a certain extent, by some of the Kalenjin group. No. 7 is a Kipsigis slasher.
FIGURE 72

1. Copy of a European axe.

2. Mbeere axe with the head wedged into the haft.

3. This axe blade goes right through its haft.

4. Axe head.

5. Axe head.


7. Axe blade obly partially penetrating its haft.
FIGURE 73

1. Unusual adze with haft-hole.

2. Kamba adze set in rhinoceros hide.

3. As above.


5. Giriama woodworking tool.


FIGURE 74

1. Small scoop for woodworking.


3. Adze.

4. Boni flanged adze made by Bajun smiths.

5. Giriama tool for scooping out wooden utensils. Approximately 30 cms long.

1. Pokot ox bell. The common type of cattle bell.

2. Pokot goat bell. The common type of bell for goats and small cattle.

3. Unusual bell for small livestock made in the same way as a socketed artefact.

4. Luo cattle bell decorated with punched ornament, and rivetted. Both most unusual traditional techniques.
1. Pokot thigh bell worn on ceremonial occasions.

2. Masai thigh bell worn on ceremonial occasions.


4. Pokot child's leather anklet with attached bells.

5. Pokot woman's leather anklet with attached bells.
FIGURE 77

1. Luyia twisted iron protective ornament worn by young women.

2. Luyia protective iron ornament.

3. The typical twisted iron ornament with a loop, which smiths wear as protection on their right arms.

4. Luyia iron ornament worn as a protection against itching skin diseases.
1-4. Special Marachi protective ornaments worn by twins. A different shape is worn by each sex.

5-7. Miniature slashers worn as protective ornaments by Marachi children.

8-9. Smiths protective iron bracelets, the insignia of their craft. In special circumstances non-smiths are also provided with them.
FIGURE 79

1. Tiriki mans protective bracelet. Men may not eat millet unless they are wearing this.

2. Tiriki protective necklet worn by young women who have suffered from ill health. This particular ornament is not effective without its pendants.

3. Tiriki womans protective bracelet. Women may not eat millet unless they are wearing this.

4. Tiriki armlet worn as a protection against itching skin diseases.
1. Mbeere woman's protective iron necklace. The loops are added after the birth of a female child.

2. Mbeere man's protective iron bracelet.

3. Mbeere elder's protective iron necklace.

4. Mbeere elder's protective iron necklace.