

STUDIES IN PRIMITIVE LOOMS.

[WITH PLATE I.]

By H. LING ROTH.

II.

5. AFRICAN LOOMS.

IN so far as my information extends there are seven forms of looms in Africa, with local variations, which, considering the enormous area of that continent, its great population with its ceaseless migrations may, perhaps, not be considered much, yet in this respect it appears to be more prolific than either the Asiatic or American Continents. The forms are :—

1. The Vertical Mat Loom.
2. The Horizontal Fixed Heddle Loom.
3. The Vertical Cotton Loom.
4. The Horizontal Narrow Band Treadle Loom.
5. The Pit Treadle Loom.
6. The Mediterranean or Asiatic Treadle Loom.
7. The "Carton" Loom.

These forms are easily distinguishable and occupy distinct areas, although in parts they overlap considerably.

1. *The Vertical Mat Loom.*—This loom, the most primitive of all, has a wide distribution, extending from the West Coast to the east of the Great Congo Basin, and is often spoken of as a grass loom on account of the warp and weft (neither of which is twisted or spun) having the appearance of grass. The filament used is, however, obtained from the leaves of the Raphia palms, *Raphia ruffa*, Mast. and *R. vinifera*, which flourish, the former in East Africa and Madagascar, and the latter in West Africa. The outer cuticle of the leaf is drawn off and the underpart cut into thin filaments by means of a leaf splitter, Figs. 48A and B. The specimen in Bankfield Museum consists of 109 thin slips of cane, 4 mm. wide, securely and ingeniously fastened together and fitted into a suitable frame. The loose ends of the slips of cane are pointed, and when the splitter is drawn lengthwise along the surface of the flayed cuticle it cuts it up into numerous filaments which are used as warp and weft without further preparation. Besides the raphia leaf filament, Sir H. H. Johnston¹ informs us that in the western and south-western Congo basin short cloths were also made from grass.

¹ *Geo. Grenfell and the Congo* (London, 1908), ii, p. 589, footnote.

The loom has two representatives in Bankfield Museum, one from the Kwa Ibo River, West Africa, kindly given to the Museum by the late Mr. John Holt, a well-known Liverpool merchant, in 1900, and the other from the Ba-Pindi people, in Central Congo, obtained in 1909 through the kindness of Mr. E. Torday.

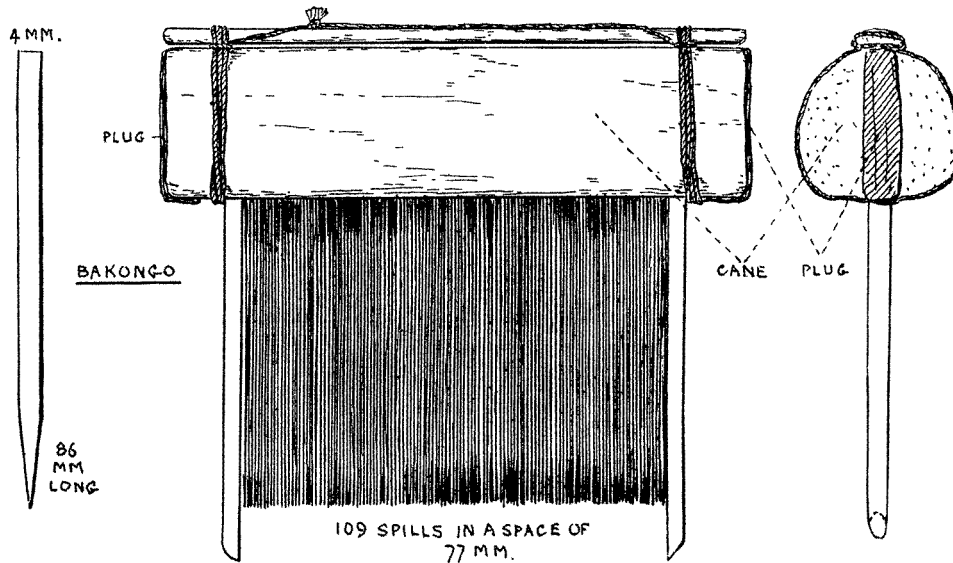
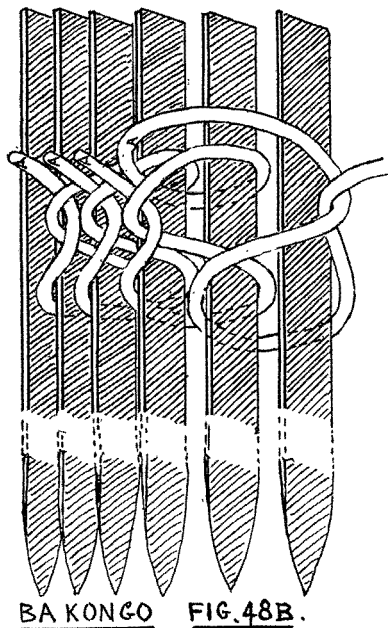


FIG. 48A. BAKONGO LEAF SPLITTER BANKFIELD MUSEUM (E. TORDAY)

The Kwa Ibo loom is evidently a very close facsimile of the one depicted by Du Chaillu as in use by the Ishogo, Fig. 49. The web, or woven mat, width is approximately 16 inches, or 41 cm., and its length from beam to beam is about 57 inches, or 1.45 m. The warp beam consists of a piece of tree branch without the bark, 32 inches, or 81 cm., long. The breast beam consists of a portion of palm leaf mid-rib or stem, common to all these looms, having a large slot at either end wherewith to fix it on to its upright supports.



The method of attaching the warp to the breast and warp-beams (see Figs. 50 and 51 A and B) is, as in all these looms, a complicated one, on account, no doubt, of the comparative smoothness of the filament, which does not bind well. The warp filaments are split up into seventy-three bunches, and their ends knotted on to a heading rod which is fitted into the groove of the breast beam, Fig. 50, all being held in position by some twisted lashing.

At a distance of about 45 inches, or 1.14 m., away from the breast beam, the warps are again bunched, but this time into fifty-seven bunches, a number which naturally does not agree with the bunching at the breast beam. These bunches are attached to the warp beam by intermediary cords, with slip knots, Fig. 58, which are wound twice round the warp beam and then, accumulating as they proceed from left to right, run along it towards the top right-hand corner, where they are tied into one big knot.



ISHOGO MAN WEAVING. FROM
DU CHAILLU'S ASHANGO-LAND. LONDON. 1867.
FIG. 49.

The heddle, according to Du Chaillu's drawing, Fig. 49, looks as though it were in reality two heddles, and Ephraim has taken it to be such.¹ But there is only one heddle, Fig. 51A, the explanation being that the heddle rod consists of two independent parts which, for the sake of convenience in weaving, the worker holds apart with his fingers and thumb and so misleads one at a cursory glance. Both parts,

¹ *Op. cit.*, p. 18.

by the way, are made up of two pieces of split cane, Fig. 51B, but that does not affect the question. A varying quantity of filaments is made up like a skein, knotted at certain intervals and placed zig-zag between the higher pair of split canes and the lower pair, Fig. 51A, and fastened in position so that the knots appear just above where the split canes are tied together, Fig. 51B. In this heddle there

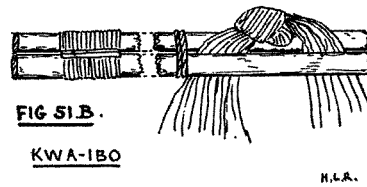
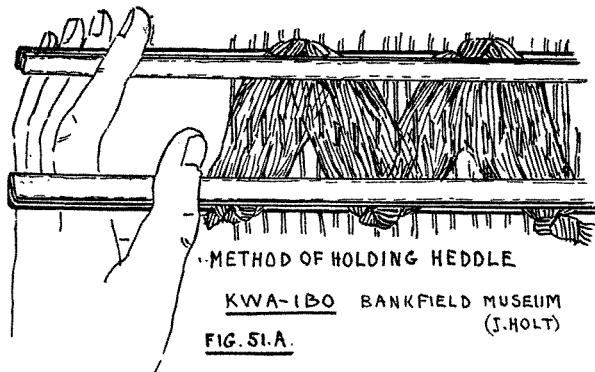
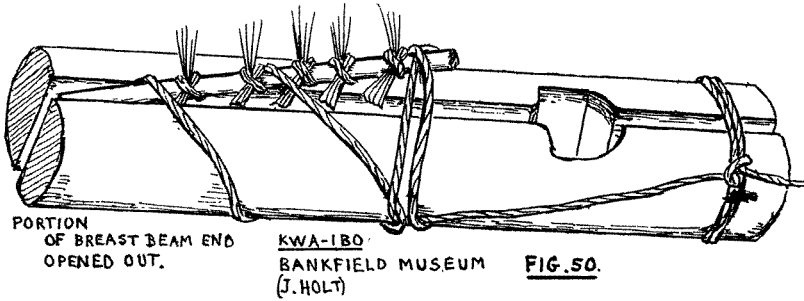
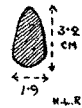
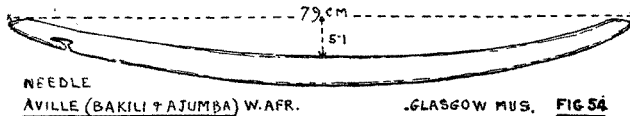
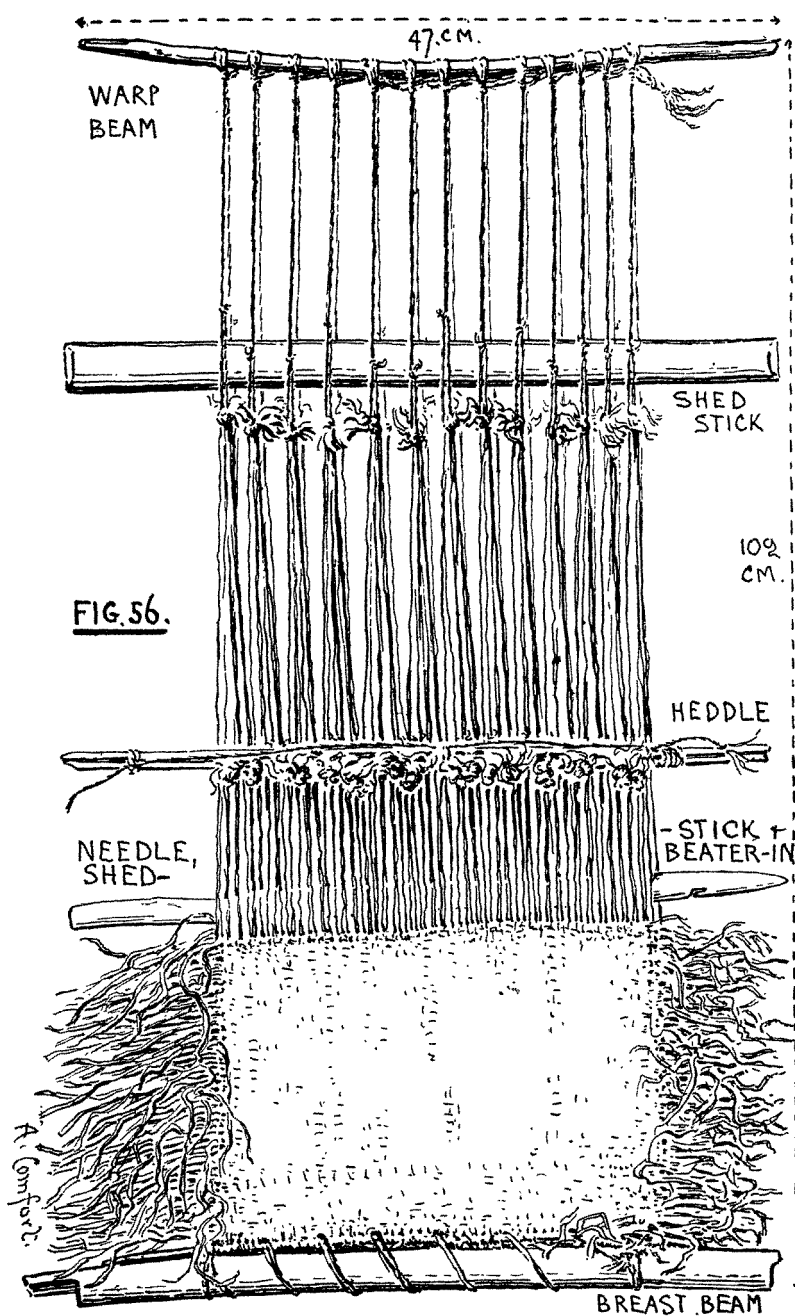


FIG. 53 NEEDLE END BABUNDA KWILU, CONGO, MANCHESTER MUS.



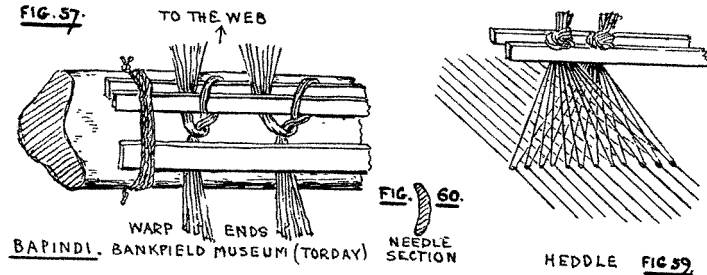
are eight such skeins, and generally speaking some of the filaments of the adjacent skeins are made continuous, but with others they are not so. Some of the individual warp filaments are held up to the heddle rod by three leash filaments, some by as many as ten—there is no fixed rule—the irregularity being apparently due to the irregular splitting of the leaf. In working, as shown, the warp between the two sets of rods is barely visible, being covered up by the profusion of leash filaments.

The loom is provided with two laze rods 14 and 16 inches, or 36 and 41 cm., long respectively and $\frac{5}{8}$ and $\frac{3}{4}$ inch, or 1.6 and 1.9 cm., in diameter; one rod is therefore shorter than the width of the web and the other only just a little longer. It is provided with a picker or warp raiser, Fig. 52, which is nothing more than a smoothed branch 15 inches, or 38 cm., long, tapering to a blunt point at one end.

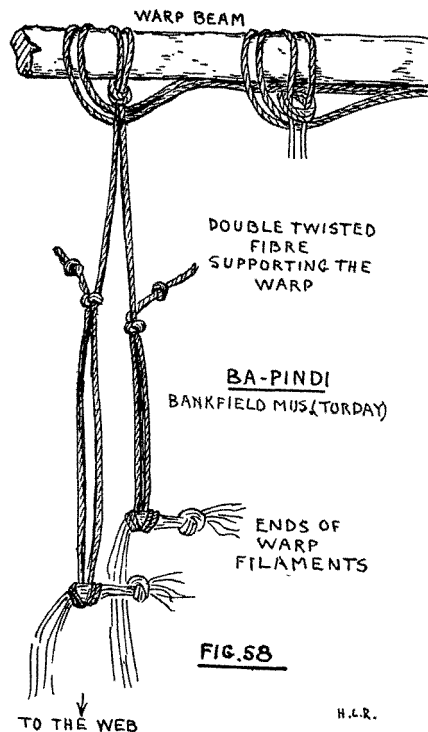


BA-PINDI LOOM BANKFIELD MUSEUM (E. TORDAY)

In all these looms the sword consists of a combination of needle, shed stick, and beater-in combined, Fig. 53. It is of a hard dark wood, somewhat curved longitudinally and is, as an exception, furnished with two nicks for carrying the weft.



The nicks are invariably cut towards the adjacent needle point so that, as the point of the sword is used as a shed opener, it would seem the method of working is to put the sword or needle through the shed, fit the weft into the notch and draw back the sword, which draws the weft with it and makes the pick. This method does not agree with the details of Du Chaillu's illustration, Fig. 49. In a Babunda needle in the Manchester Museum the nick is cut both ways, Fig. 55.



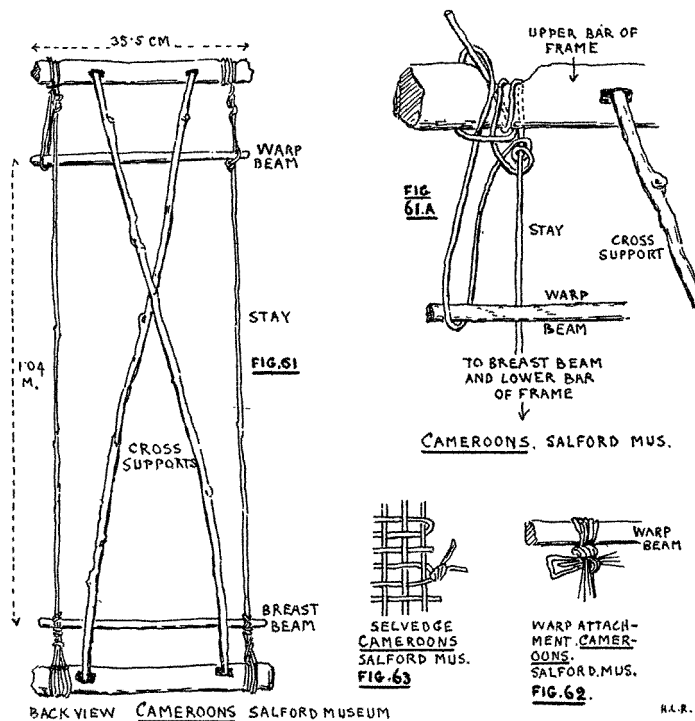
The weft is discontinuous, each piece being a few inches longer than the width of the web; there is no selvedge, and hence no temple is used. There are 22 picks to the inch, or 8·7 to the cm., and 31 warps to the inch, or 12·3 to the cm.

The Ba-Pindi loom already referred to, Fig. 56, differs from the Kwa Ibo loom in some details worth noting. The length overall is 49 inches, or 1·24 m., with a web width of 18½ inches, or 47 cm. The method of attaching the warp ends to the breast beam is as follows, Fig. 57. The ends are passed between a pair of thin heading rods, then over and under both pieces and into the loop thus formed, which on drawing tight becomes a knot. This arrangement is placed on the beam and an extra batten, consisting of a wider and larger piece of cane, placed over the warp ends to just below the knots and then all lashed on to the beam by means of some coarse cord.

In another specimen in Bankfield Museum this extra batten is cut out of the breast beam itself and fitted back into its place with the warp ends between it and the beam, which ensures a firmer grip. About 30 inches, or 76 cm., more or

less, from the breast beam the warps are bunched together into twenty-six lots and connected up with the warp beam as in the Kwa Ibo loom, only, instead of all the cord ends being carried to the right-hand top end and there tied into a big knot, they are cut off at various lengths.

The heddle, Fig. 59, consists of two strips of cane between and on which rest eight sets of two knots each of the leash ends which support the warp. Every leash, like the warp and weft, consists of about twelve to fifteen separate filaments. Each set of leashes is distinct from the next, *i.e.*, is not continuous and extends only from one knot to the other of its set and not beyond, and is so arranged that when the knots are placed side by side the leashes separate out and cross one another.

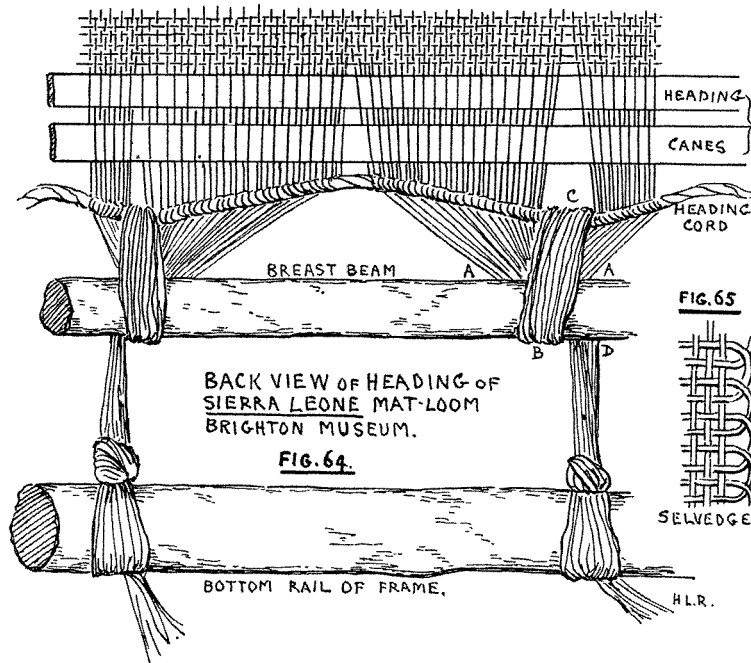


There is one shed stick made of palm leaf mid-rib. The needle is curved in transverse section, Fig. 60, with the working- or beating-in edge almost as thick as the back or opposite edge, which is usually broader. Sometimes both edges are sharp and frequently the working edge is serrated with wear.

In a loom from the Cameroons in the Royal Salford Art Gallery and Museum there is an arrangement, Figs. 61 and 61A, found also elsewhere in West Africa, for obtaining rigidity in the loom frame and therefore better weaving. It consists of two stout rods held apart by means of two cross supports (wood branches) and triced together by means of stays (lianas), the breast and warp beams being made fast to the stays. The holes in the two stout rods into which the cross supports are fitted are at the back of these rods and the cross supports are curved like a bent

bow and so act like a spring in keeping the stout rods and beams well apart. The warp attachment is very simple, Fig. 62.

On this loom the web (which is omitted from the illustration for the sake of clearness) shows an incipient stage of selvedge. Occasionally longer pieces of weft than merely suffice for one pick are used and are turned back at the edge ready for the next pick and so making a selvedge, Fig. 63, or occasionally two weft ends are tied together in a knot at the edge, which again forms a selvedge. The casual, and therefore early, stage of the selvedge is indicated by the fact that these knots are 18, 8, 16, etc., picks apart; neither do they correspond at the opposite edge. Other details of this loom are: width of web 10 inches, or 25·4 cm., and about eight picks to the inch, or three to the cm..

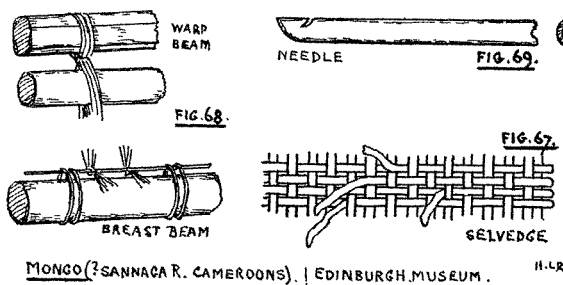
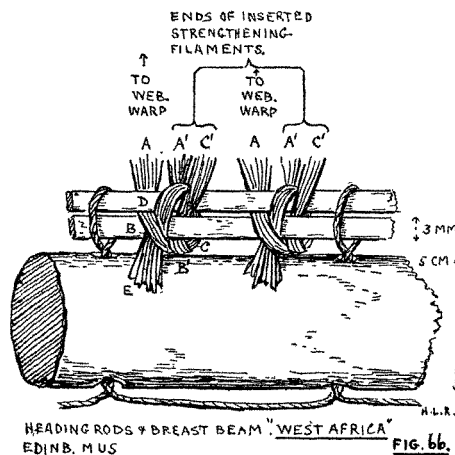


A complicated form of heading is shown in a loom, said to come from Sierra Leone, in the Brighton Museum, added to the collection there in 1886, and is explained by the illustration, Fig. 64. The details are: frame supported by cross supports and stays is $57\frac{3}{4}$ inches, or 1·47 m., long by $27\frac{1}{2}$ inches, or 70 cm., broad. Length, breast beam to warp beam inclusive, 35·5 inches, or 90 cm., and width of web $8\frac{1}{4}$ inches, or 21 cm. Approximate number of warps to the inch $42\frac{1}{2}$, or 16·6 to the cm., and $20\frac{1}{3}$ wefts to the inch, or 8 per cm. The weft is not continuous, but there is a perfect selvedge, Fig. 65. A somewhat similar selvedge is found on an Old Calabar loom in Bankfield Museum, Fig. 75. A longitudinal pattern is obtained by dyeing the warp previous to laying out.

A different form of heading arrangement is shown on a loom, Fig. 66, of unknown provenance in the Royal Scottish Museum, Edinburgh, where the cord

fastening the heading rods to the breast beam are put through holes in the latter instead of winding round the beam as is usually the case. In a loom from Mongo in the same collection (Edinburgh) there is complete selvedge, Fig. 67, on both edges, which however is not brought about by a continuous weft. After the pick is made the end of the weft is returned over the pick for a distance of about half an inch, or 11 mm., when it is allowed to emerge, and floats free like a sort of inner fringe. In this loom the warp attachments are simple, Fig. 68, and the sword while curved in transverse section is longitudinally quite straight, which appears exceptional, Fig. 69.

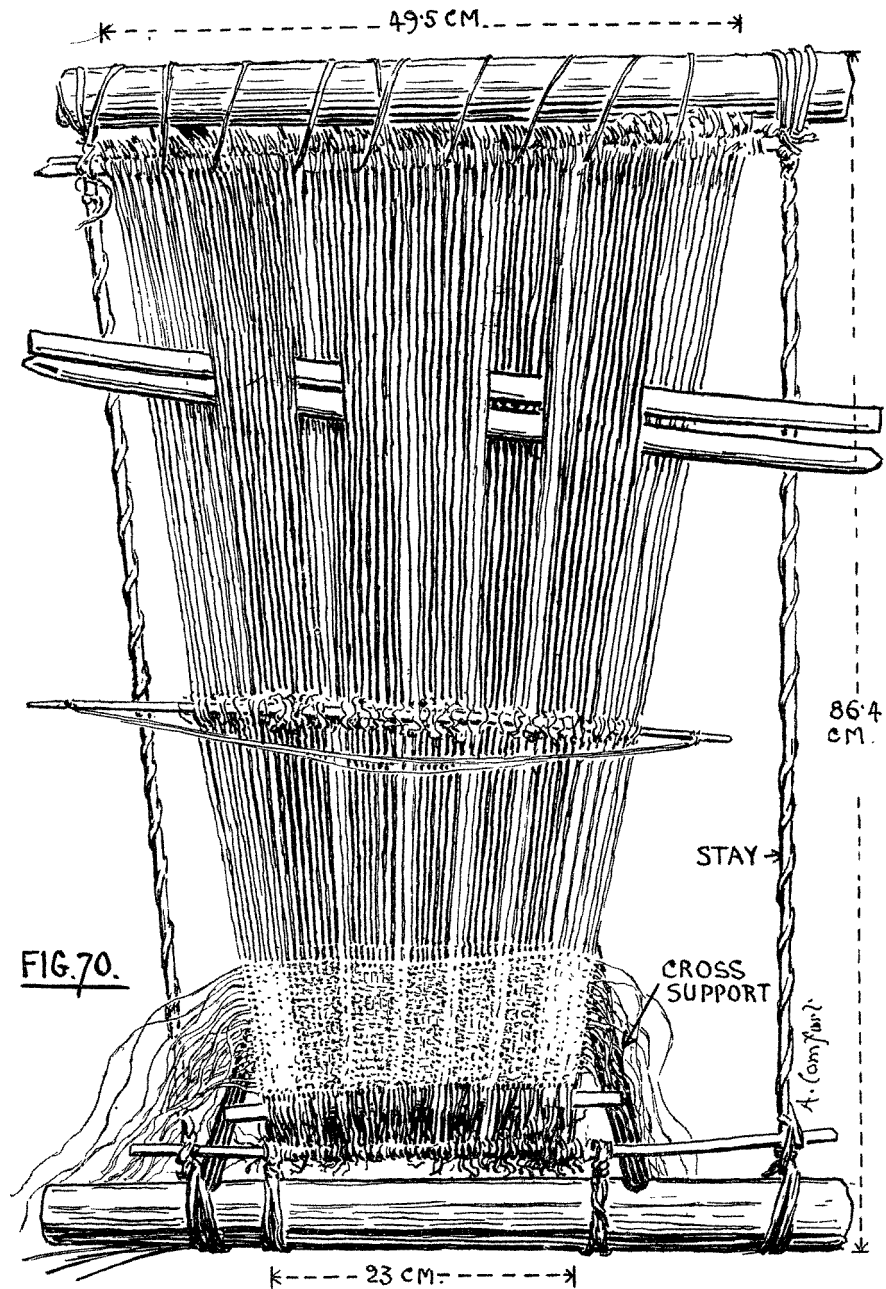
The Liverpool Museum possesses a bag loom, Fig. 70, with completely woven bag still in position, and the Glasgow Art Gallery and Museum possesses another such loom on which only a portion of one side of the bag loom has been completed. As the incomplete bag makes a more interesting study, it will be as well to describe the Glasgow one. The frame is supported by cross supports and stays as in Fig. 61. The warp is so beamed that one side of the bag may be woven first, then when completed the loom is turned back to front and the other side of the bag woven. The method of division of the warp for the front and back is shown in Fig. 74: it is the same for both looms. Curiously enough there are nearly double the number of warp in the set for the back, yet to be commenced upon, than there are in the set for the half-finished front. Perhaps some of the former are cut away when weaving commences, or perhaps they are preparatory for the two sides of a second bag off the same loom with the same beaming. The shape of the bags is that of a



truncated isosceles triangle, with top and bottom parallel but the bottom narrower than the top, with the sides expanding regularly from bottom to top.

On the half-finished front side there are 62 bunches of warp covering a width of 18½ inches, or 47 cm., on the warp beam; these bunches are reduced in number

to 21 thicker bunches covering a width of 8 inches, or 20 cm., on the breast beam. There is no inserted warp, the number of filaments on both beams being the same; the number of warps *to the inch* is therefore more on the breast beam than on the

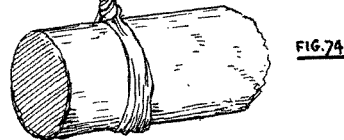
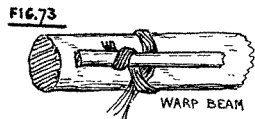
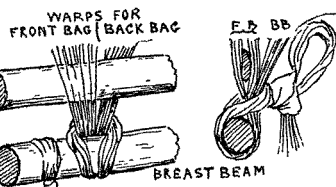
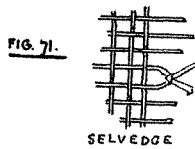
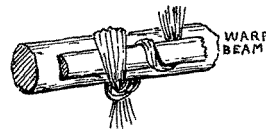
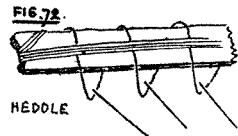


OLD CALABAR, LIVERPOOL MUS. BAG LOOM (RIDYARD).

warp beam, being compressed into 10½ inches, or 27 cm., less space than on the warp beam. The bunches are :

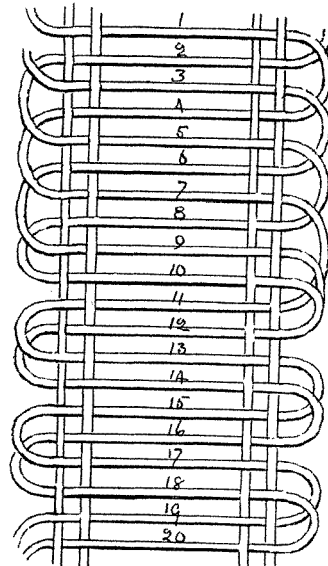
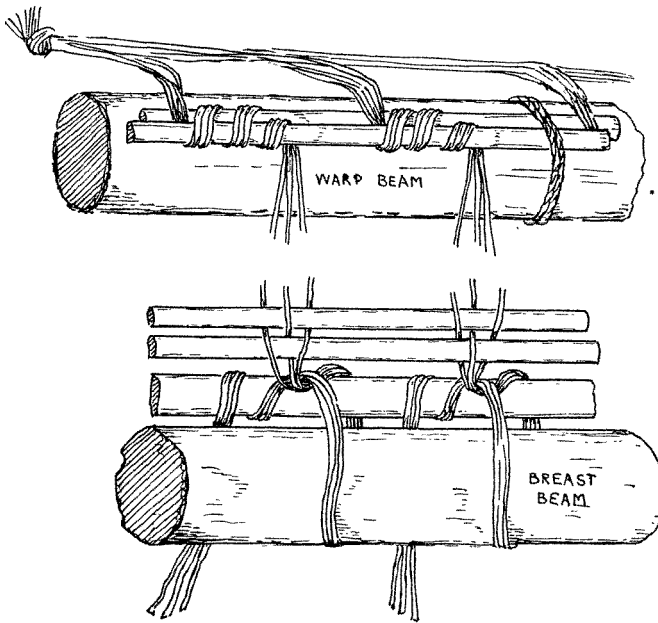
Warp beam : 17 non-coloured, 8 black, 12 red, 8 black, 17 non-coloured.

Breast beam : 7 non-coloured, 2 black, 4 red, 2 black, 6 non-coloured.



OLD CALABAR, GLASGOW MUS.
BAG LOOM.

BAG LOOM, OLD CALABAR, LIVERPOOL MUS.



SELVEDGES SHOWING CHANGE
(AT NO. 19) WHEN TWO WEFTS
MERGE INTO ONE.

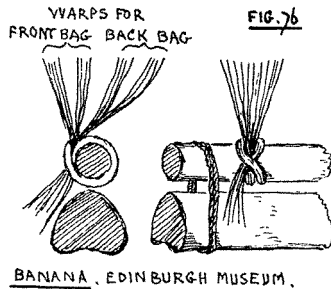
FIG. 75.

OLD CALABAR.

BANKFIELD MUSEUM.

H. L. R.

To prevent the outer warp getting awry, at intervals of $1\frac{1}{2}$ –2 inches, or 4–5 cm., the weft ends are knotted together over the outermost warp, Fig. 71; but this can only be a temporary or working selvage to be undone preparatory to interlacing the finished woven front and back. On the back, evidently to keep the warp of the bag from getting entangled with those of the front, seven laze threads of twisted fibre have been drawn irregularly through it, the ends of these laze threads being fastened to the stays.



The heddle rod is a flat piece of wood having the leashes kept in position by means of longitudinal cords. Details of the warp attachments are given in Figs. 73 and 74.

In connection with bag looms may be noticed one from Banana, Congo River, in the Royal Scottish Museum, Edinburgh, which is prepared for weaving two bags (or four mats?) from one and the same breast beam, but with distinct warp beams. Each set of warp is provided with a Du Chaillu heddle, laze rod and needle, the warp ends being fixed along the warp beam in the usual method. All the needles are concave on the working edge with corresponding convexity on the back edge. The width of the weave is $16\frac{1}{2}$ inches, or 42 cm., fine work. The object of weaving four sides off one breast beam will save labour in beaming; but only one person can work at it at a time, for all the heddles are placed on the same side of the warp and two people working at it would interfere with each other.

A very interesting loom, Plate I, is one marked Okale (Ba-Hamba) in the British Museum. It is in most respects like the rest of these looms, but shows a pattern (Fig. 77) obtained by means of black-stained wefts, the pattern being roughly arranged in the warp near the warp beam by means of 36 strips of cane 4 mm. wide, which are in fact pattern laze rods. In this specimen, owing to previous rough handling, I have not been able to prove conclusively the connection

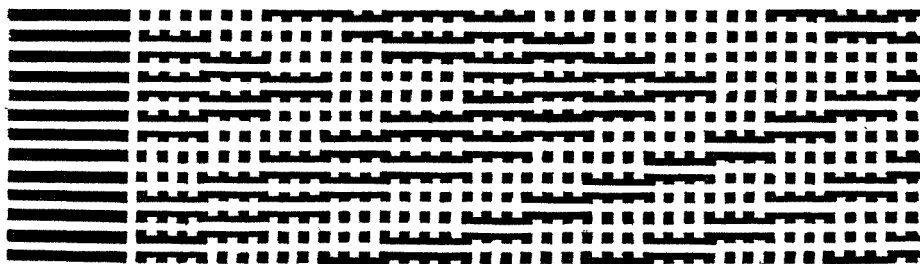
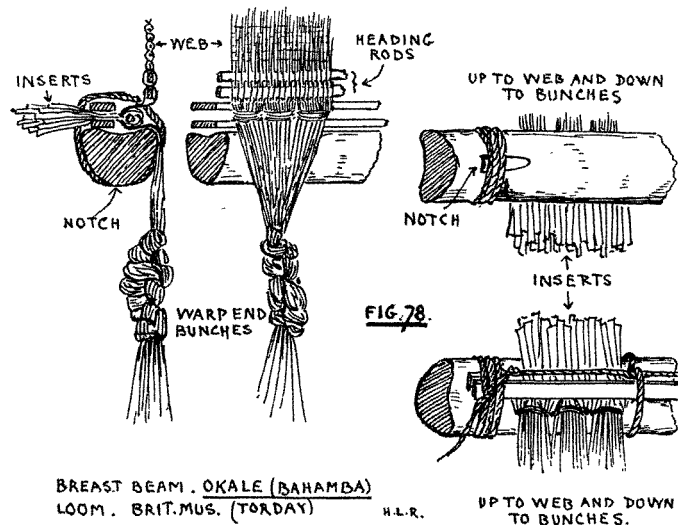


FIG. 77. PORTION OF PATTERN ON OKALE (BA-HAMBA) LOOM, BRIT. MUS. (TORDAY).

between the two by running the fingers along the warp, but that a connection exists is evident from the illustration. As already mentioned (Vol. XLVI, p. 306), this method is found in Ancient Peru and in the East. The dimensions of the loom are: length, breast beam to warp beam inclusive, 34 inches, or 86 cm., the knotted warp

ends hanging down a further 12 inches, or 30 cm.; width of web 16 inches, or 40·5 cm.; 30 warps to the inch (or 11·8 to the cm.); 24 picks to the inch (or 9·5 to the cm.). The warp is always in pairs ("sisters") and hence passes through the leashes in twos; these leashes are of finer filament than the warp and weft. The needle is of the usual hard wood, slightly concave on the working edge, which is blunt but without serration. The selvedge is apparently made after the completion of the weaving, but there are selvedge knots, as shown in Fig. 71, every 20 to 24 picks. Details of the complicated warp attachment to the breast beam are given in Fig. 78.

As to the origin of this mat loom there is no other loom in any way comparable with it except perhaps the Vertical Cotton Loom discussed on pp. 135–144, and when we have said that they are both upright looms and are furnished with a heddle, the comparison is at an end. There is a great gulf between this mat



loom and the Ancient Egyptian vertical looms, for the illustrations of which we are indebted to N. de G. Davies.¹ Both are upright, both have a heddle, and both are worked by men—as a rule. The Ancient Egyptian weaver used a ball of yarn for his weft, while the modern African uses a needle as weft-carrier, which serves also as a shed stick and beater-in. The Ancient Egyptian loom had, in so far as we can judge, ordinary heddle leashes which were not bunched, and the African weavers have bunched leashes. The only comparison one can make is with the bunching of the leashes on the Livlezi loom, Fig. 87. This, however, gives one the impression of a raphia weaver adopting his own method with an introduced filament, *i.e.* cotton, and as the bunching lessens the control of the weaver over his warp there is not the likelihood that the cotton weaver adopted the raphia weaver's method.

¹ See *Ancient Egyptian and Greek Looms*, by H. Ling Roth (Halifax, 1913).

All the intact specimens which have come under my observation show considerable neatness in the make, being well and carefully put together; the weft-carrier is nicely finished; the comb-like leaf-cuticle splitter is a trim little article; the work produced is excellent of its kind, especially the embroidery work of the Ba-Kongo, for instance, which, although considered to be a recent introduction,¹ is fine and artistic. As will have been seen, the selvages are in various stages of development, and the heddles show some variation in their leash attachments. The parts may be crude, but they are not slovenly made, and it is very clear that much care has been devoted to getting both the loom and the web to a comparatively high pitch of excellence. Altogether one gets the impression that the makers and users of this form of loom are a progressive people. The form is, however, extremely primitive, and this, together with the mat work found side by side, tempts one to conclude that the form may be indigenous to the habitat of the raphia palms. But before adopting such a conclusion it will be as well to examine the various steps apparently necessary to be taken in the transition from mat work² to weaving, for the majority of students who have looked into the question of the origin of weaving are of opinion that it originated in basketry or matmaking.

The transition appears to be due to an appreciation of the principle of the heddle, as yet unknown, and the translation of that principle into a mechanical factor. The principle is already in action when, in making a mat, the worker raises (1) one of the filaments, the warp, to pass or interlace the other filament, the weft, and it is intensified when he raises two or more warp filaments together (2) with the purpose of saving labour. In so far as one can judge, this would have been followed by permanent bunching—*i.e.* by means of leashes (3)—which would take the place of the fingers, and is the first mechanical step towards the adoption of the heddle. At this point, if not sooner (I judge from my own experiments), it would probably be found that some arrangement (4) is necessary whereby the warp can be kept more or less taut, the matter depending largely on the nature of the material employed. A further advance would consist in attaching the leashes in bunches to short pieces of wood (5) to enable them to be lifted more easily—a sort of handle, in fact—as can be seen in a belt loom from Iceland in Bankfield Museum, where there are three such sets of warp-raising leash-bunches, each attached to a wooden rod 5 cm. long, by means of which the whole of the required warp is raised at thrice. In the Ba-Pindi loom we have the complete transition where the leashes, although still bunched, connect the warp to a single rod (6), whereby the whole of the required warp is raised at once and the mechanical factor has come into full play.

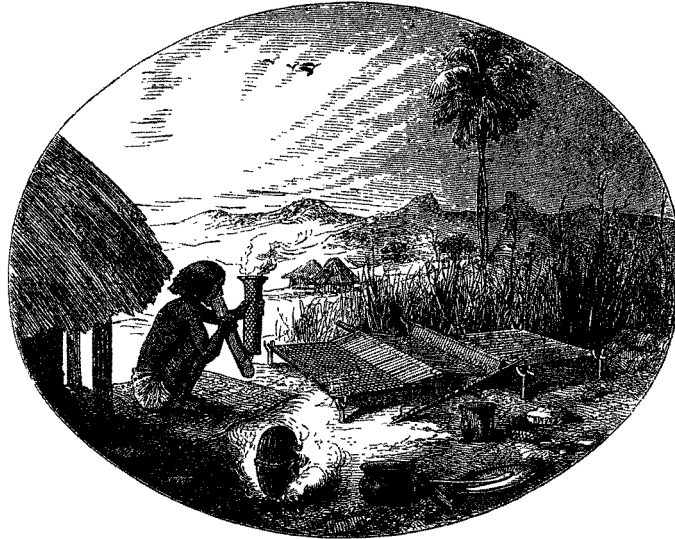
Accepting this surmise of the progress of the transition as approximately correct, we are in want of evidence as to steps (3) and (4) in the development of this

¹ Torday and Joyce, "Les Bushongo," *Ethnographie*, ser. iii, tome ii, fasc. i (Bruxelles, 1910), p. 45.

² I am not here referring to plaited mats, but to mats the components of which are interlaced at right angles to each other without the use of a frame.

mat loom, and for want of this I must for the present withhold any definite conclusion as to the indigenoussness of the loom where we now find it.

2. *The Horizontal fixed Heddle Loom.*—This loom, Fig. 79, on which in Madagascar both raphia fibre mats and silk cloths are woven, appears to be used in



MANGANJA LOOM. FROM C. & D. LIVINGSTONE'S EXP.ⁿ
TO THE ZAMBEZI. LONDON. 1865. P. 112.

FIG. 79.

Africa for weaving cotton only. It is laid stretched out close to the ground, nearer to the ground in Madagascar and North Central Africa than in South Central Africa, and is worked with the usual laze-rods, spool, and beater-in, its characteristic being the fixed heddle. At first sight such a fixture makes it look somewhat

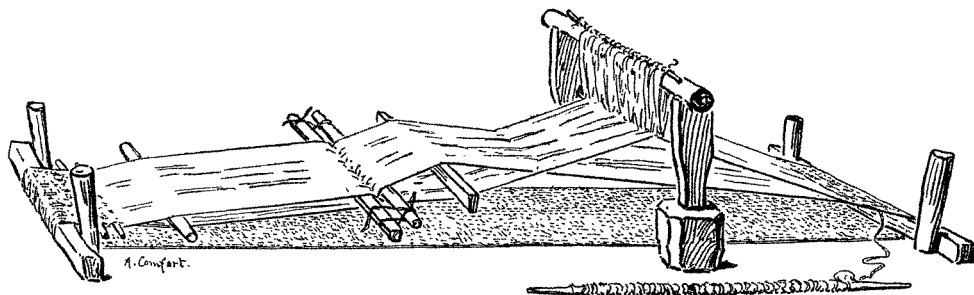


FIG. 80.

WORKING MODEL OF MADAGASCAR MAT LOOM BANKFIELD MUSEUM. (SIBREE)

awkward to work, but on rigging up a similar loom I found I could work it quite comfortably. A good idea of the loom can be obtained from a study of the illustrations, Figs. 80 and 81, Fig. 80 representing a model in Bankfield Museum of a Madagascar mat-weaving loom brought home by Dr. Sibree in 1915, and Fig. 81

representing a model, likewise in Bankfield Museum, of a loom used by the A-Fipa in their country south-east of the Victoria Nyanza and north-west of Lake Tanganyika, and brought home six years ago by the Rev. Harry Johnson. In the Madagascar loom the warp (? raphia fibre) is continuous, while in the A-Fipa loom in Bankfield Museum, as well as in one from the same people in the Leicester

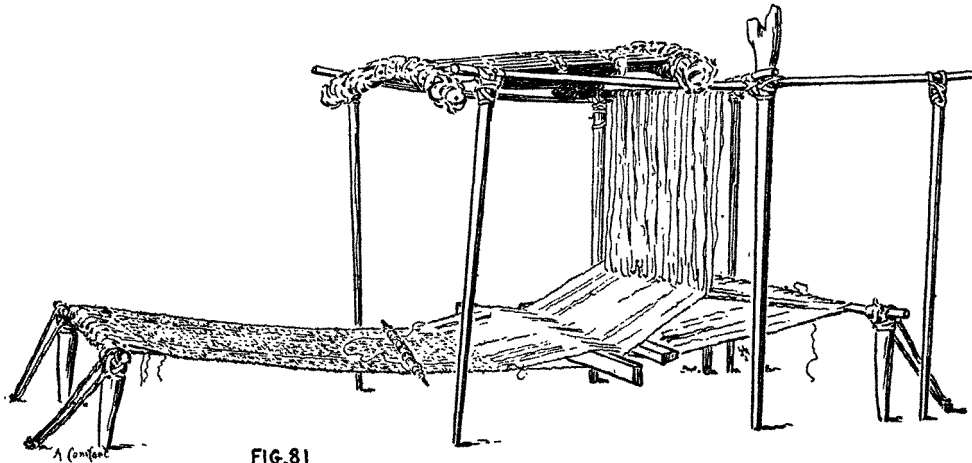
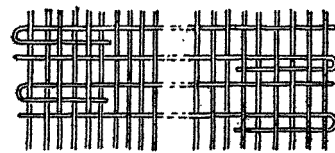
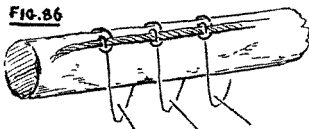
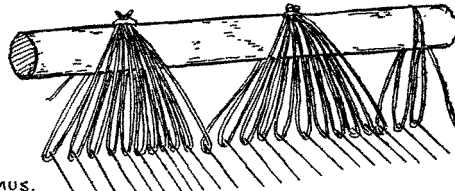


FIG. 81

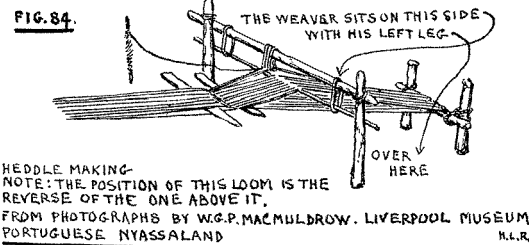
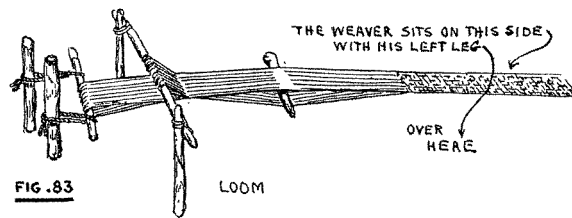
WORKING MODEL OF A-FIPA COTTON LOOM . BANKFIELD MUSEUM. (H. JOHNSON)

Museum, it is not so. In the Madagascar specimen the weft is likewise continuous, but not so in the A-Fipa loom, where the selvedge is finished in a curious way. The yarn on the spool is, of course, continuous, but when a pick has been made, it appears to have been cut off at both ends about $\frac{1}{2}$ inch, or 1.3 cm., longer than the width of the web and the over-lengths woven in, the result being that the cloth

FIG. 82 SELVEDGE AFIPA LOOM. BANKFIELD MUSEUM (JOHNSON)FIG. 83A
HEDDLE . PORTUGUESE NYASSA
LAND . LIVERPOOL MUS. (W.C.P. MACMULDRON).FIG. 86
HEDDLE . MANGANJA . EDINBURGH MUS.
(LIVINGSTONE)FIG. 87. HEDDLE LIVLEZI H.A.R.
GLASGOW MUSEUM

for about $\frac{1}{2}$ inch depth for the whole length of both selvages is much closer than for the rest of the web, as shown in Fig. 82. It reminds one of the selvedge in the mat-weaving loom, as illustrated in Fig. 67, with this difference, that in the A-Fipa cloth the over-length is placed *by the side* of the pick, while in the Mongo mat it is placed *on top* of the pick.

Last year Mr. W. G. P. Macmurdrow gave the Liverpool Museum one of these looms from Portuguese Nyassaland, but unfortunately without the frame supporting the heddle. He also gave that museum a photograph of a native boy weaving, and another of a native boy rigging up the heddle for warp-laying.¹ The photographs, owing to difficulties in the taking, are not quite so clear as could be desired,



but I think the essentials have been reproduced in the illustrations, Figs. 83 and 84. The dimensions of this Portuguese-Nyassaland loom are: Beam to beam inclusive, 67 inches, or 1·70 m.; width of web, 4 inches, or 10·2 cm.; 25 picks to the inch, or 10 to the cm.; length of heddle rod, 25 inches, or 63 cm., with a diameter of 2 cm.; spool, 22·5 cm. long, of the *Ba* type. The yarn for both warp and weft does

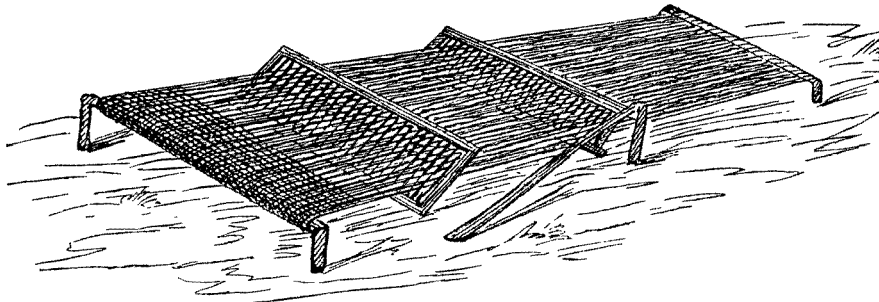


FIG. 85. Abbild. 23. Webstuhl vom unteren Sambesi. Nach Globus 10/1866.

not appear to be indigenous. The warp ends are fixed on to the beams by means of some gluten, which has hardened like dried breadcrumbs. The frame of the model in the Leicester Museum is likewise fixed together with some resinous substance,

¹ H. Schurtz, in his *Urgeschichte der Kultur* (Leipzig, 1900), gives us an illustration of a Swahili likewise laying his warp, and has even the heddles in position, but it is somewhat misleading, as he does, to label the illustration "Swaheli at a Loom," for the man is *not* weaving.

and in the Bankfield Museum model the parts are lashed together. In a Livlezi loom, Fig. 87, about to be described, the warp is also fixed to the beams by a sort of resinous gum.

Judging from a photograph of a silk loom placed at my disposal by Dr. Sibree, and partly reproduced in Fig. 90, it would seem that occasionally in Madagascar a second heddle is in use. It is upheld by two iron supports (*BB*), which appear capable of being brought forward towards the weaver and pushed back, actions which must cause the heddle to be lowered and raised.

Dr. Livingstone was the first to give an illustration of the Fixed Heddle Loom. This was in 1865.¹ It is reproduced in Fig. 79. The now defunct journal, *Globus*, reproduced it fairly well (No. X, 1866), but with embellishments, and with the mistake of taking the spool for an ordinary stick. Ephraim, without verifying his quotation, ignores Livingstone in the matter, ascribes the loom to *Globus*, and reproduces it past all recognition, as shown in Fig. 85. Livingstone does not describe it, but he brought home a specimen which he obtained from the Ma-Nganja, south of Lake Nyassa, and which is now in the Royal Scottish Museum, Edinburgh. This specimen is unfortunately incomplete, and does not include the heddle supports. Its details are: The warp (of cotton) is many feet long; the width of the web at the heading is 23 inches, or 58 cm., but where the work has ceased it is only 20 inches, or 51 cm., wide, so evidently a temple was not in use. The leashes of the heddle are continuous, and are secured in position by knotting over a cord which runs the length of the rod, Fig. 86. The spool is a piece of split-pointed cane 39 inches, or 99 cm., long.

Another specimen of this loom is to be found in the Glasgow Art Gallery and Museum, marked "Livlezi loom, south of Lake Nyassa." It is likewise a cotton loom. Length, beam to beam inclusive, 61 inches, or 1.54 m.; width of web at heading, 20½ inches, or 52 cm., but 18 inches, or 46 cm., at the last pick when work was suspended, indicating absence of temple. Both beams are of hard cane, and, as already mentioned, the warp is gummed to them. There are 52 warps to the inch, or 20.5 to the cm.; and 12 picks to the inch, or 4.7 to the cm. The warp is not continuous but the weft is. The spool is 31 inches, or 78 cm., long. Like in the Ma-Nganja loom the length of the spool appears out of proportion to the width of the web. The heddle leashes are sisters and continuous, and 48 or 50 are bunched over the heddle rod, Fig. 87, as in a specimen of the raphia looms of the Ba-Pindi, Fig. 59, as already mentioned. In the Livlezi loom and in the Ma-Nganja loom, as well as in the working models in Bankfield and the Leicester Museums, the yarn used has a strong twist so that the cloth has the well-known crinkled appearance.

What seems to be the same type of loom and found in Darfur is illustrated by Wilson and Felkin.² Dr. Felkin says of it: "The looms are very primitive;

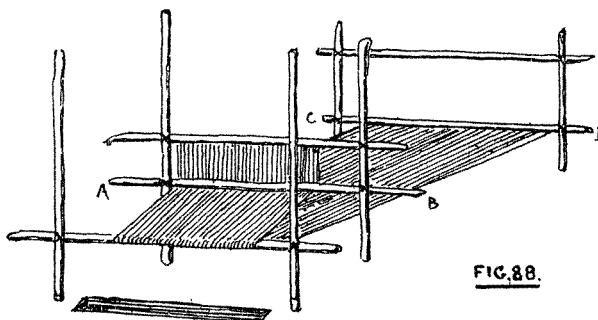
¹ David and Chas. Livingstone, *Narrative of an Expedition to the Zambesi and its Tributaries*, London, John Murray, 1865, p. 112.

² *Uganda*, London, 1882, p. 274.

they are very narrow, and are usually placed under the hedge or a tree low down on the ground, with a hole made underneath to accommodate the weaver's legs." The existence of this pit would lead one to infer that we have to do here with a pit-treadle loom, but the pit is an innovation in connection with this loom, due to contact with the Hindu pit-treadle loom, about which a few words shall be said directly.

It may be mentioned in parentheses that innovations in details, obviously from the East Indies or Arabia, are very common in the lands bordering the East coast of Africa; thus, for example, Miss Werner illustrates in her work¹ a native loom which, while then in use in that part of Africa, must have come from elsewhere, a good but troublesome example of the migration of the arts.

On the face of it Wilson and Felkin's illustration, although it shows clearly the fixed heddle, is defective, and on my asking Dr. Felkin about it he very kindly replied (May, 1916) and acknowledged the incorrectness of the drawing. It is reproduced in Fig. 88. In writing me, Dr. Felkin mentioned that the weaver



LOOM, DARFOUR. WILSON & FELKIN'S UGANDA. LONDON. 1862. II.
[ROD AB SHOULD BE OMITTED & WARP FROM AB TO CD INSERTED]

"with a stick of hard wood beats the weft away from him. This is the usual method, but I have seen looms where the weaver beats the weft towards him. This is rare, however. As a foot or so of cloth is finished it should be wound up at the back part of the loom if the weaver beats the weft away from him, the reverse is done if he beats the weft towards him." So that the loom is altogether anomalous, as it shows contact on more sides than one. Up to this point, in so far as my knowledge of these looms goes, there is no winding-up of the web as it gets woven, for in the models in Bankfield and the Leicester Museums there are no movable breast beams, although these are good working models, and in the Madagascar and other illustrations the warp is continuous—like that of a seamless garment—and the warp is shifted round as the weaving goes on, which only ceases when the heading nearly meets the tailing. Incidentally it should be stated that Ephraim, again omitting to verify his quotation, reproduces Felkin's illustration and incorrectly ascribes it to Prof. R. Hartmann, who had reproduced it in a popular work

¹ *The Natives of British Central Africa*, London, 1906 (to face p. 196).

entitled *Die Nillaender*. On the other hand, it may be that Felkin's loom marks a point of contact between the southern and northern distribution of the Fixed Heddle Loom, for further north the warp is much longer and does get wound up.

Fig. 89 shows a reproduction of a water-colour sketch by Frederick Goodall, R.A., in Bankfield Museum, of a weaver at work in Upper Egypt. We must not expect accuracy from an artist, but in this sketch I venture to think that he has indicated very well the fixedness of the heddle which places this loom in the class under discussion, only, instead of being supported from a frame above, or resting on wooden supports, it rests on a couple of stones. Then there is the very broad loom used by the Bedawin in Upper Egypt, and apparently along the whole length of the northern portion of the Sahara, which seems to me to be similar to that depicted in Fig. 89A, and which Franz Stuhlmann¹ considers to be identical with the vertical loom, only laid flat. But to me it appears to be a

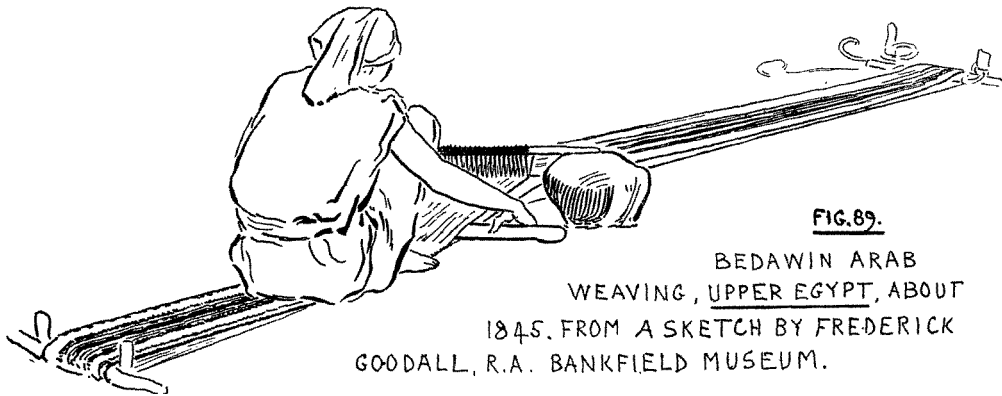


FIG. 89.
BEDAWIN ARAB
WEAVING, UPPER EGYPT, ABOUT
1845. FROM A SKETCH BY FREDERICK
GOODALL, R.A. BANKFIELD MUSEUM.

modification of the Fixed Heddle Loom. I have *not* seen this loom and only know it by means of illustrations. There is a very poor reproduction of one entitled: *Femmes tissant le Felidj (toile de tente) dans un campement d'Aurès*, facing p. 426 of Lieut.-Col. de L'Artigue's *Monograph de l'Aurès*, Constantine (Algiers), 1904. There is a somewhat similar one in Madame Jean Pommerol's *Among the Women of the Sahara*, London, 1900, p. 307; one illustrated by R. Karutz in *Globus*, 1907, XCII, No. 8, p. 119, who by the way mentions that on one occasion two women wove a tent cloth on it; and one by Frederick Goodall, above mentioned, and illustrated in Fig. 89A.

The Ancient Egyptians depicted a loom, pegged out like this one, in the Tombs of Chnem-hotep, but the position of the woman's hand at the end of the heddle and the absence of any indication of a support tends to the view that it is not a fixed heddle. On the other hand, the illustration in the tomb of the Vizier Daga, drawn by N. de G. Davies,² shows the weavers' hands quite clear of the

¹ *Ausflug in den Aures*, Hamburg, 1912, pp. 116, 118.

² *Five Theban Tombs*, Plate XXXVII.

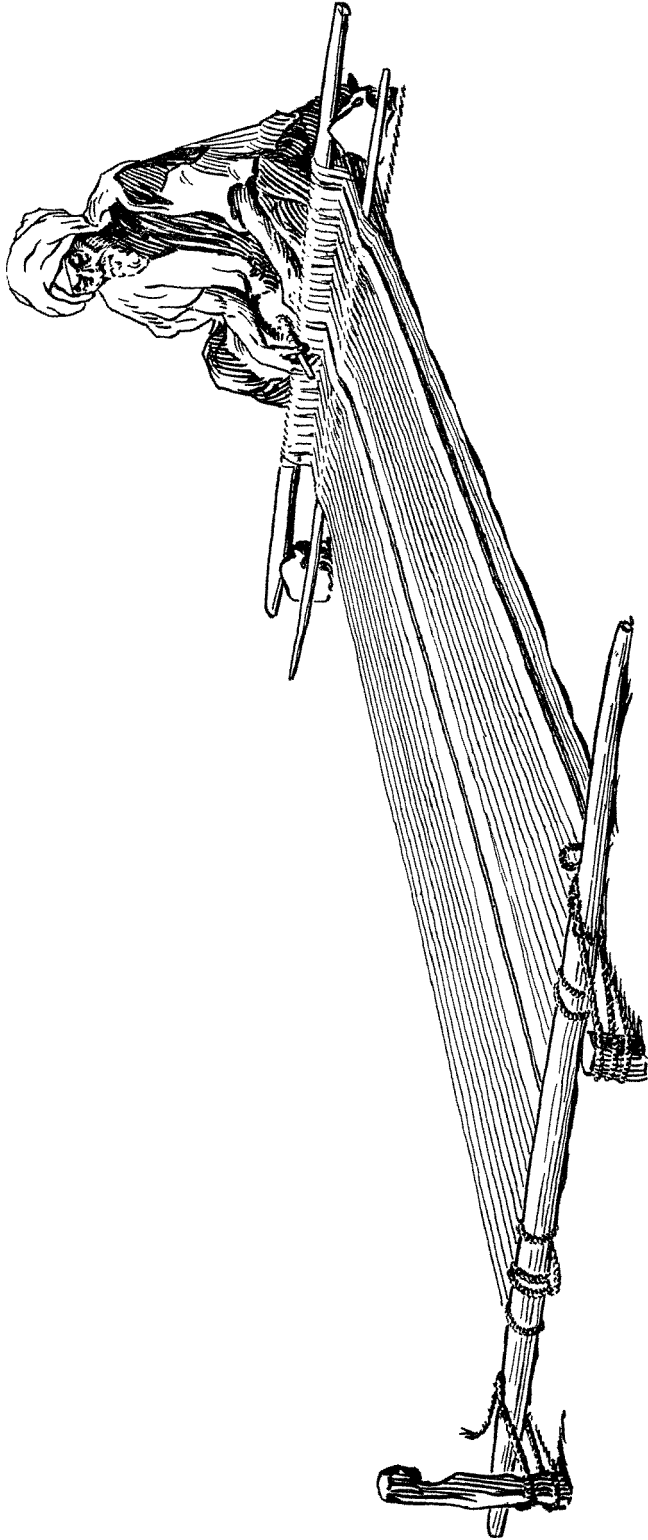


FIG. 89A BEDAWEN WEAVER. FROM THE PAINTING BY FREDK. GOODALL R.A. ENTITLED SPINNERS & WEAVERS. REPRODUCED BY PERMISSION OF THE OWNER, MR W. K. DARCY OF STAMMORE HALL, STAMMORE FROM THE ILLUSTRATION IN CASSELL & CO.'S ROYAL ACADEMY PICTURES, 1892.

heddle, with a curious hook-shaped contrivance at either end, which might possibly be construed into some sort of support, but it is extremely doubtful. Garstang's

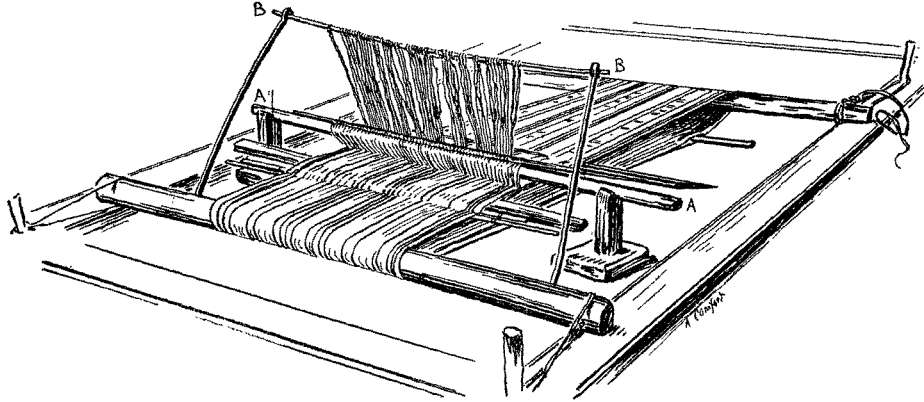


FIG. 90. MADAGASCAR LOOM FROM A PHOTOGRAPH (REV. DR. SIBREE).— AA FIXED HEDDLE ROD. BB LOOSE HEDDLE ROD.

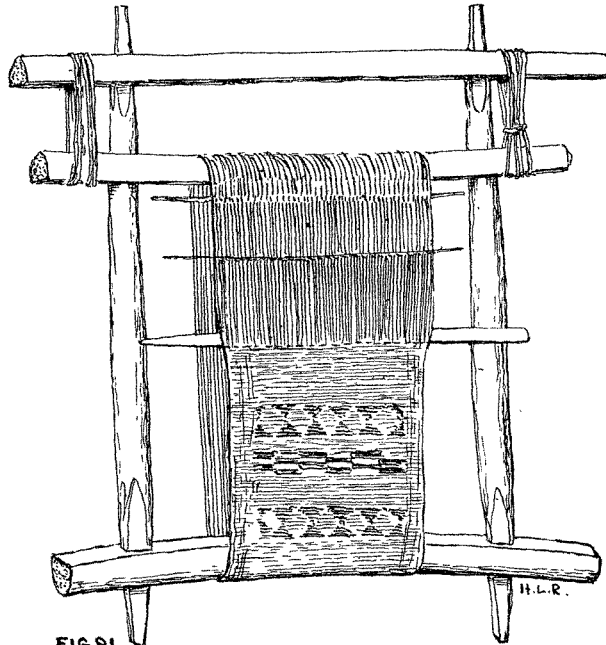


FIG. 91.
TYPE OF VERTICAL COTTON LOOM, WEST AFRICA

wooden model of two women weaving, found in a tomb at Beni Hasan,¹ is unfortunately on too small a scale to be of any assistance.²

¹ *Burial Customs of Ancient Egypt*, London, 1907.

² All these Egyptian looms are illustrated in *Ancient Egyptian and Greek Looms*, already quoted.

The Madagascar looms show Oriental influence, but I think that when Grandidier says that the "loom of the Malagashes is identical with that of the Indo-Oceanic peoples"¹ he goes much too far. It seems certain, however, that it has crossed from the island to the mainland of Africa, and in extending northward met another, a similar loom, coming south from Egypt or Somaliland—its extension westward along the Mediterranean and the Sahara being no doubt due to Arabic-Berber migrations.



FIG. 91A. "WOMEN WEAVING A JERRI" FROM JEAN POMMEROLS AMONG THE WOMEN OF THE SAHARA. LONDON 1900 P. 299.

3. *The Vertical Cotton Loom.*—We now come to the vertical cotton loom on which plain and pattern cloths are woven. The illustration, Fig. 91, gives its chief characteristics, as it can be seen at the present day, on the West Coast in Abeokuta, Opobo, etc. In Figs. 91A and 91B we have it as met with at the present, in perhaps a more original form, in Algeria. It is everywhere worked by women only. Miss Gehrts² mentions that at Bafilo, the only place she seems to have observed the loom, the women weavers had a guild such as the men weavers have elsewhere.

¹ *Ethnographie de Madagascar*, Paris, 1908, p. 63, footnote.

² *A Camera Actress in the Wilds of Togoland*, London, 1915, pp. 93-4.

The West Coast modification consists of a square frame made up of an upper and lower piece of palm leaf mid-rib or stem into which are fixed two uprights; occasionally, instead of the ends of the uprights passing through holes in the upper and lower ribs, they are merely lashed on to the latter, Fig. 92. The

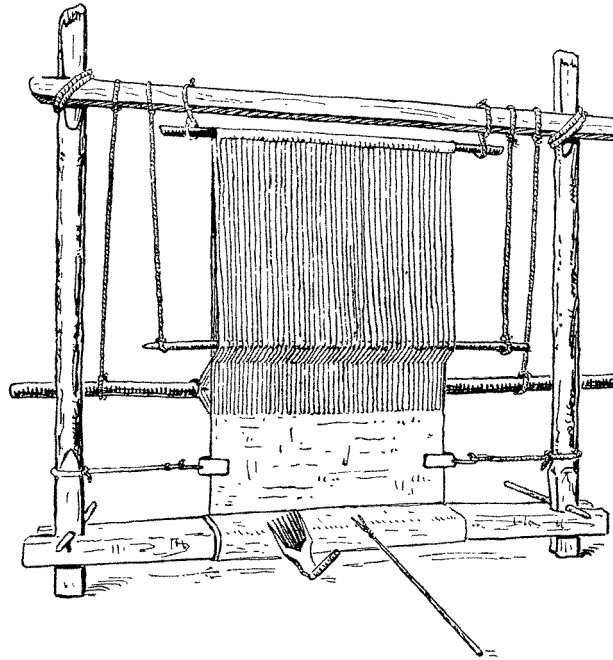


FIG. 91B. VERTICAL WOMENS HANDGRIP LOOM. FROM FRANZ STUHLMANN'S AUSFLUG IN DEN AURES, HAMBURG. 1912 AFTER B. FATAH'S METHODE DIRECTE POUR L'ENSEIGNEMENT DE L'ARABE PARLE. ALGER. 1904.

lower rib forms the breast beam, which is sometimes furnished with a supplementary rod A, Fig. 93; the upper rib itself occasionally forms the warp beam, but usually another rib suspended below it does this. As the palm leaf mid-rib employed does not possess much rigidity, the two beams sag towards each other when the warp is *beamed* (*i.e.*, put on to the loom). On the West Coast the warp is continuous, but in Algeria this is not the case. The weaving proceeds from below upwards. Generally the heddle consists of two very thin pieces of cane with spiral leashes intertwined, Fig. 94.

The Bankfield specimen of this class of loom is from Abeokuta, having been obtained there in 1904 by Mr. Cyril Punch, the donor. It is without the upper frame bar. Its dimensions are: length, beam to beam inclusive, 53 inches, or 1.35 m.; width of web, 27 inches, or 69 cm.; 26 picks to the inch, or 10 to the cm.; and 84 warps to the inch, or 33 to the cm. The shed stick, like the two beams, is of palm leaf mid-rib. There are two rods which might be taken for ordinary laze rods, and while they do to a certain extent function as such, the laying-out of the warp indicates them as pattern rods similar to those in Plate I,

and to the pattern threads in the Peruvian loom, Fig. 40, although in the web so far as it is woven there is no weft pattern. These rods are 1 by $\frac{1}{2}$ inch, or 2.5 by 1.2 cm., in thickness. The heddle, Fig. 95, contrary to the usual, consists of one strip of cane, $\frac{1}{4}$ inch, or 6 mm., thick, and a piece of blue cord. It is raised by hand. When the pick is made and the heddle is dropped, the tension of the warp should be sufficient to bring down the warp threads 1, 3, 5, 7, etc., into the same plane as the warp threads 2, 4, 6, 8, etc., but owing to the want of rigidity in the beams already referred to, this only takes place in a very modified manner, and a raiser or picker-up, Fig. 96, for the warps 2, 4, 6, 8, has to be brought into use. It consists of a thin rod of wrought iron (not wire) hafted into a suitably shaped piece of wood. The spool, $31\frac{1}{2}$ inches, or 80 cm., long, belongs to type A a 1.

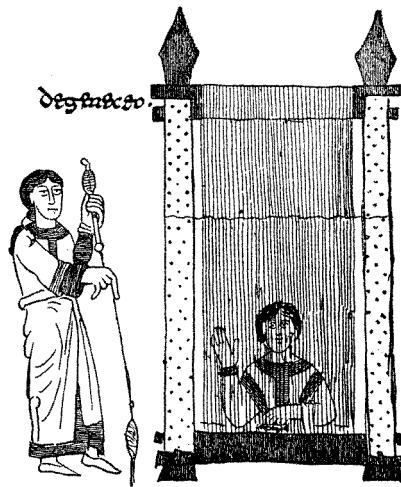


FIG. 91C TAPESTRY FRAME FROM MS. CODEX BY RABANUS MAURUS. IX CENT. (AFTER A. SCOLE, ENCYCLOP. BRIT. 12TH ED)

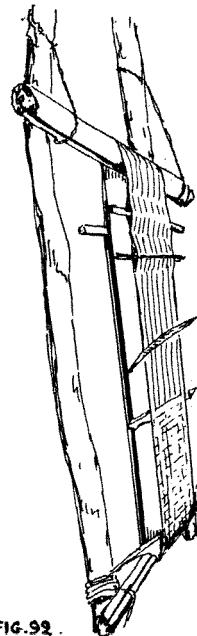


FIG. 92. ILORIN WOMAN'S LOOM (APPROXIMATE REPRODUCTION) FROM BINIUS' VOICE OF AFRICA. SIDE VIEW

The weft is generally stouter than the warp, which is laid alternately in varying breadths of brown and white which gives the striped pattern. The temple consists of two flat thin pieces of cane rind $\frac{5}{8}$ inch, or 1.6 cm., wide, Fig. 97, both ends of both pieces tapering to a point.

In the looms of this class from Opobo (Manchester, Salford, Liverpool and Glasgow Museums), from Southern Nigeria (Imperial Institute) and from Akweta, Lower Niger (Liverpool Museum), there is brought into use a rod which is carved "herring bone" fashion on the surface, Fig. 98. Its function appears to be that of a laze rod and not that of a pattern rod: it would be of use mostly in long and broad weaving to prevent warp entanglement.

Coloured geometrical weft pattern weaving on these looms has reached a high pitch of excellence, all things considered; blue, yellow, red and white yarn being used over a blue warp and weft with generally a few inches of coloured warp at both selvages. The pattern is woven on top of the plain web as the latter

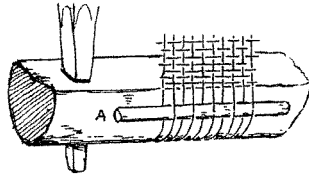


FIG. 93 BREAST BEAM, SOUTHERN NIGERIA. IMPERIAL INSTITUTE.

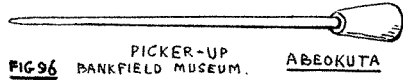


FIG. 96 PICKER-UP ABEEKUTA BANKFIELD MUSEUM.



FIG. 97 TEMPLE ABEEKUTA BANKFIELD MUSEUM

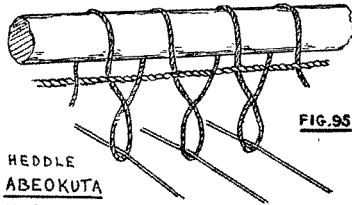
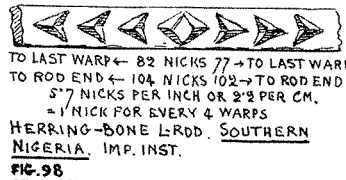


FIG. 95 HEDDLE ABEEKUTA BANKFIELD MUS.



TO LAST WARP ← 82 NICKS 77 → TO LAST WARP
TO ROD END ← 104 NICKS 102 → TO ROD END
57 NICKS PER INCH OR 2 1/2 PER CM.
= 1 NICK FOR EVERY 4 WARPS
HERRING-BONE LARD. SOUTHERN NIGERIA. IMP. INST.
FIG. 98

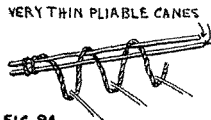


FIG. 94 VERY THIN PLIABLE CANES SOUTHERN NIGERIA. IMP. INST. TYPE OF HEDDLE IN USE WITH WEST AFRICAN VERTICAL COTTON LOOMS

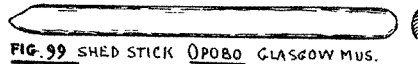
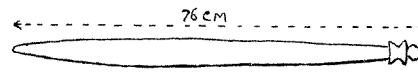


FIG. 99 SHED STICK OPOBO GLASGOW MUS.



76 CM. 4 CM. BROAD 1 CM. THICK BEATER-IN SOUTHERN NIGERIA. IMP. INST. FIG. 100

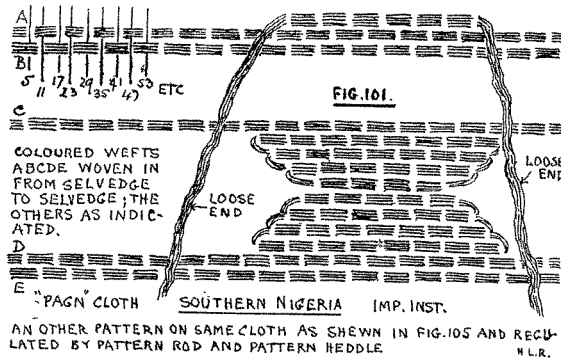
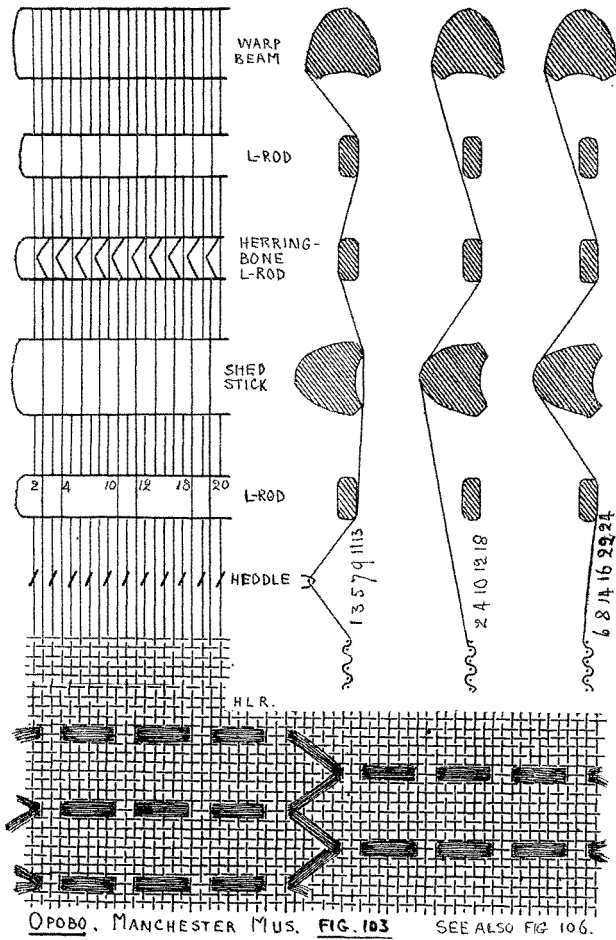
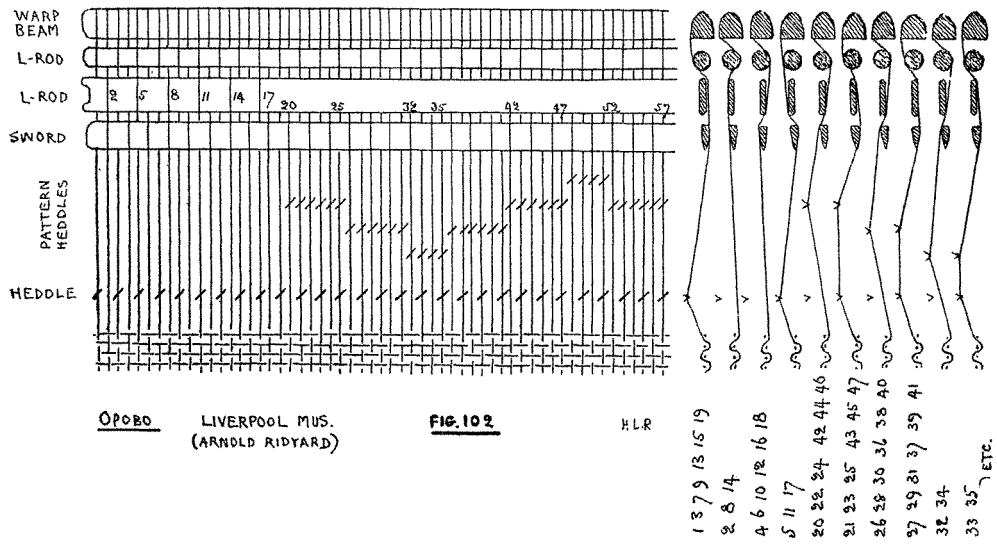
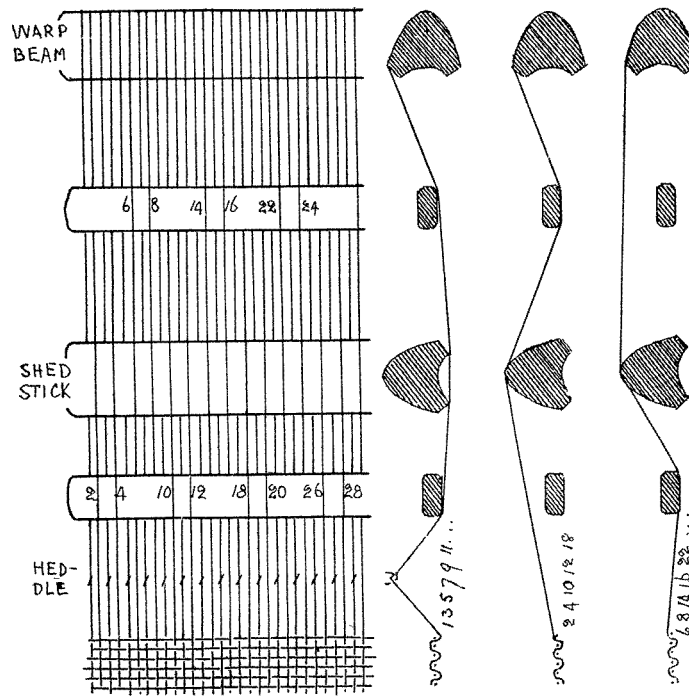


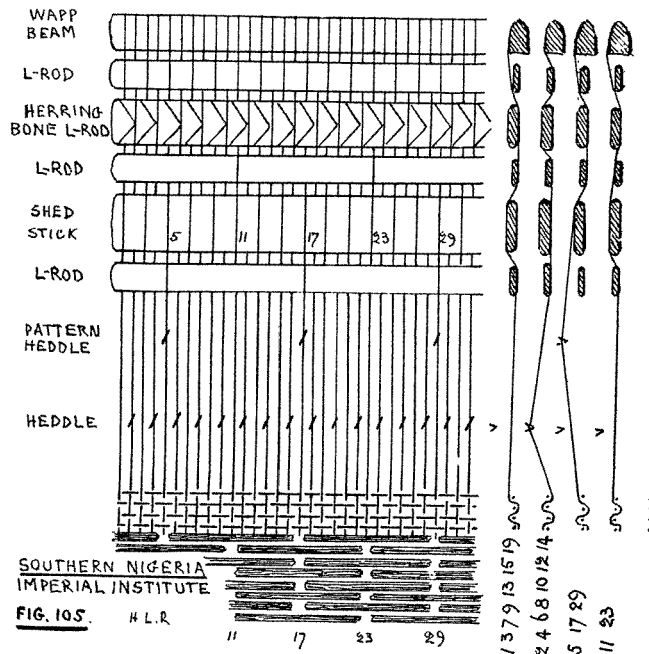
FIG. 101. COLOURED WEFTS ABCDE WOVEN IN FROM SELVAGE TO SELVAGE; THE OTHERS AS INDICATED. "PAGN" CLOTH SOUTHERN NIGERIA IMP. INST. AN OTHER PATTERN ON SAME CLOTH AS SHOWN IN FIG. 105 AND REGULATED BY PATTERN ROD AND PATTERN HEDDLE. H.L.R.

proceeds, and is woven right across the web or in part only as required; if in part only the ends of the weft hang down as shown in Fig. 101 until further required. For this sort of pattern weaving the worker is guided by the special way in which the warp is laid out. Every third, fourth, sixth or twelfth warp, as the case may be, is made to pass over the pattern rod as shown in Figs. 102, 103 and 105, and



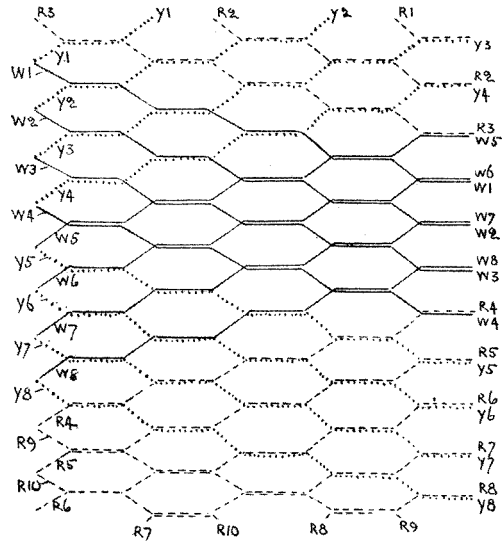


ABEOKUTA. BANKFIELD MUS. (C. PUNCH) FIG. 104. H. L. R.



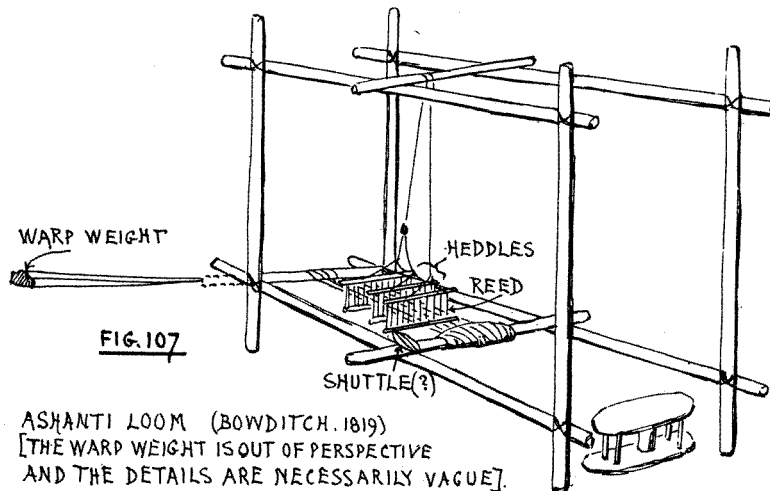
in order to ascertain at which warp the pattern weft is to be inserted or withdrawn the weaver must apparently run his finger from that warp on the pattern rod down to the web, and where that warp passes into the web he will insert or withdraw his spool as the case may be. One loom, Fig. 102, from Opobo (Liverpool Museum) is provided with four pattern heddles as well as a pattern rod.

According to Van Genep¹ the designs are taken from domestic objects, and he mentions particularly that one is taken from the pulley-block of a treadle loom. On the other hand Pommerol,² who no doubt had better access to the womenfolk than he could have had, speaking of an excellent old woman, says: "El Haj teaches novices the art of casting the threads of the weft [*sic.*, should be warp.—H. L. R.] from one peg to another and arranging these threads vertically in the primitive looms, made of wood, string and reeds. She teaches them how to dye wool and how to mix



OPOBO, MANCHESTER MUSEUM FIG. 106
 PATTERN WOVEN ON WITH WARP THREADS NOS. 2 4 10 12
 18 20 ETC. FIG. 103, AS GUIDES
 R ---- = RED W ---- = WHITE Y ... = YELLOW

the different shades of colour; but one thing she jealously guards, and that is the secret of the hieroglyphics, those mysterious and cabalistic designs, such as

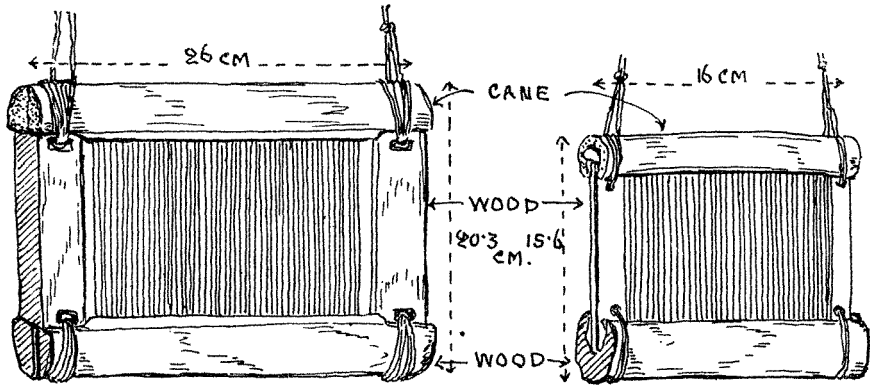


ASHANTI LOOM (BOWDITCH, 1819)
 [THE WARP WEIGHT IS OUT OF PERSPECTIVE
 AND THE DETAILS ARE NECESSARILY VAGUE].

squares, zig-zags and arabesques, which represent sometimes an object, sometimes an idea, and sometimes a phrase. Only to a few initiated does El Haja teach, and

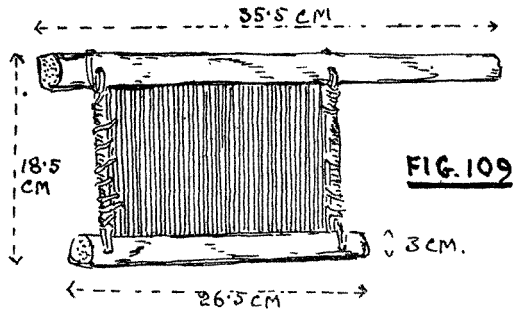
¹ *Études d'Éthnographie Algérienne*, Paris, 1911, p. 100.

² *Op. cit.*, p. 298.

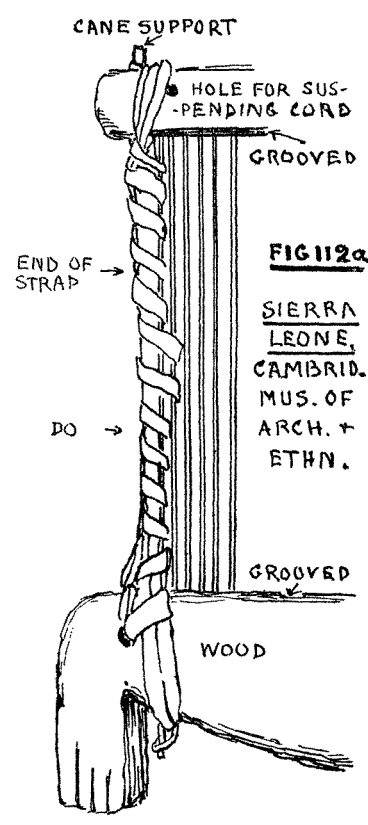


REED AND SHUTTLE
← 23.5 CM →
WITH OUTLET HOLE
ABEOKUTA (C.PUNCH) 1903
BANKFIELD MUSEUM.

REED AND SHUTTLE
← 22.8 CM →
NOT PROVIDED WITH
OUTLET HOLE.
KWITTA (ARN.RIDYARD) 1915
BANKFIELD MUSEUM.

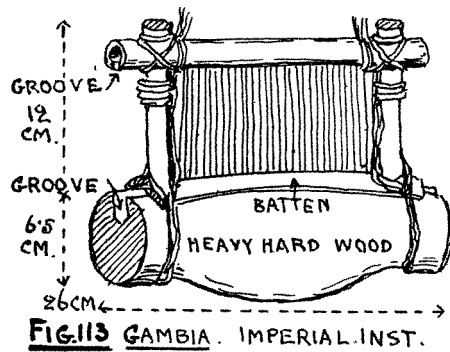
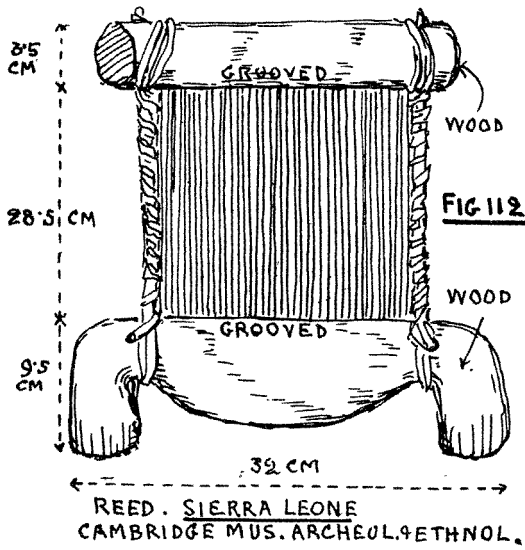
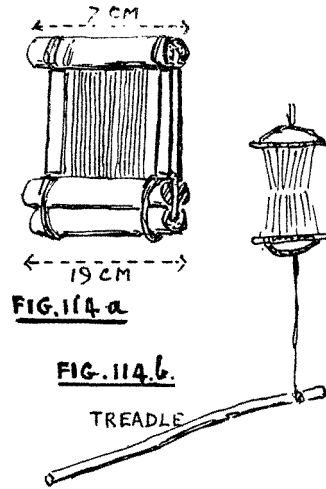
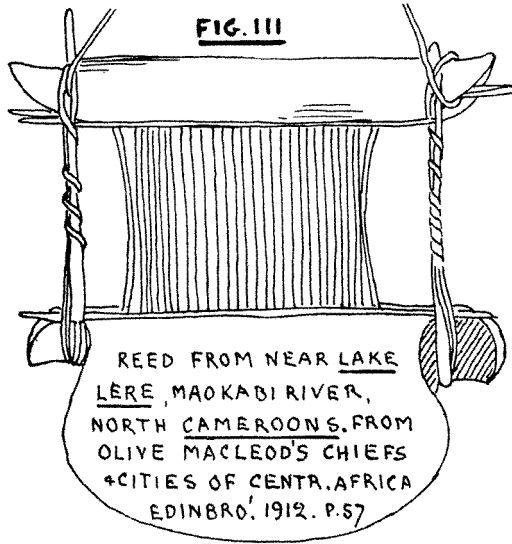


REED OF TRIPOD LOOM
WITH EXTENSION TO FORM
A HANDLE, WITHOUT ANY
ROD TO JOIN THE TWO HORI-
ZONTALS (UPPER + LOWER
PORTIONS).
TIKONKO VILLAGE (MENDE
PEOPLE), SIERRA LEONE
(REV. W.T. BALMER) 1904.
BANKFIELD MUS.

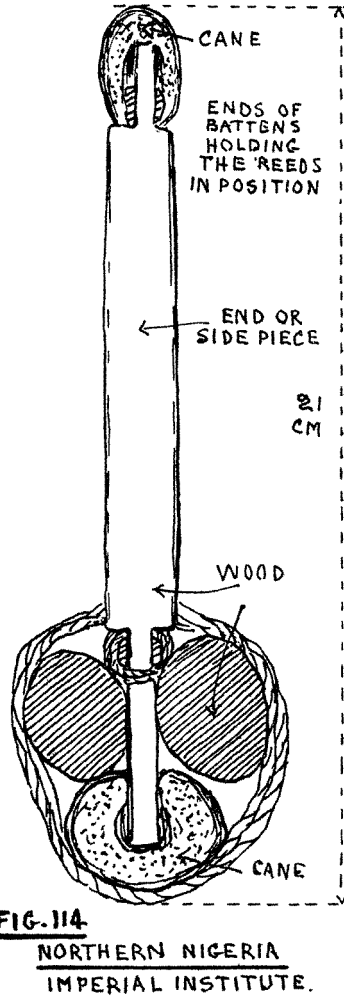


SIERRA
LEONE,
CAMBRID.
MUS. OF
ARCH. +
ETHN.

H.L.R.



H. L. R.



that grudgingly, this ancient writing, which she herself does not understand, enshrouding as it does the thoughts of races long since passed away.”

The loom is used for providing a variety of articles, and is also used as a tapestry loom and so carrying us back to the Middle Ages. A. J. Cole illustrates what appears to me to be the same loom in an article on Tapestry,¹ Fig. 91c, from a IXth Century MS. As a tapestry loom it is the same apparatus used for making rugs in India (there is a specimen in Bankfield Museum), and as an ordinary cloth loom it is presumably the same as the Ancient Egyptian loom depicted in the tombs of Thot-nefer and Nefer-ronpet, already referred to, although in the latter one of the looms appears to be served by a woman.

Stuhlmann,² following Frobenius, proposes to call this form of loom the grip loom because the shed is made by gripping the heddle instead of the shed being made by means of treadles. The term is suitable if confined to looms in which there is really a gripping of the heddles, but cannot be applied to all non-treadle looms, for the latter include the Fixed Heddle Looms.

4. *The Horizontal Narrow Band Treadle Loom.*—The narrow band treadle loom, which is a fully developed loom supplied with reed, harness, treadles, etc., may be seen in two sub-forms as it were: (a) the one furnished with a rectangular frame on the plan of our hand looms, and (b) the other furnished with a *tripod* frame.

The first writer to give us an illustration of the rectangular frame loom was T. E. Bowditch,³ who tells us: “The Ashantee loom is precisely on the same principle as the English; it is worked by strings held between the toes; the web is never more than four inches (10 cm.) broad.” His illustration is reproduced here, Fig. 107, *minus* the weaver, who does not add to the clearness of it. The illustration depicts a rectangular frame consisting of four uprights, three top beams, and four lower beams; the warp extends beyond the frame and appears to be made taut to a heavy stone, acting as a sort of anchor while the cloth is rolled up on a breast beam; there are two heddles which look very much like the reed (beater-in), and in spite of his remark he does not show the string connecting the lower shafts of the heddles with the weaver’s toes; it is possible that there is an indication of a shuttle. The narrow pieces of cloth (band) produced on this loom vary from 2 to 6 inches, 5 to 15 cm., in breadth. The reed, Fig. 108, is the best part of it, and generally consists of a more or less square hardwood frame 6 inches by 7 inches, 15 by 18 cm., or thereabouts; all four sides are equally thick, and when fitted together and tied up the whole is fairly rigid. The reed is also frequently made with the side pieces much lighter than the top and bottom, so that it would be too light to swing back into position after beating-in, to obviate which the bottom wood is made heavier than the top one, or other pieces of wood are fastened to it as shown in Figs. 111, 112, 113, and 114. The reed is suspended by cord and not by side battens like our sley side supports. The heddles are likewise suspended by a cord which passes over an ill-formed pulley, Fig. 119, the roller of which is

¹ *Encyclopædia Britannica*, xiith ed.

² *Aures*, p. 117.

³ *Mission from Cape Coast Castle to Ashantee*. 4to. London, 1819.

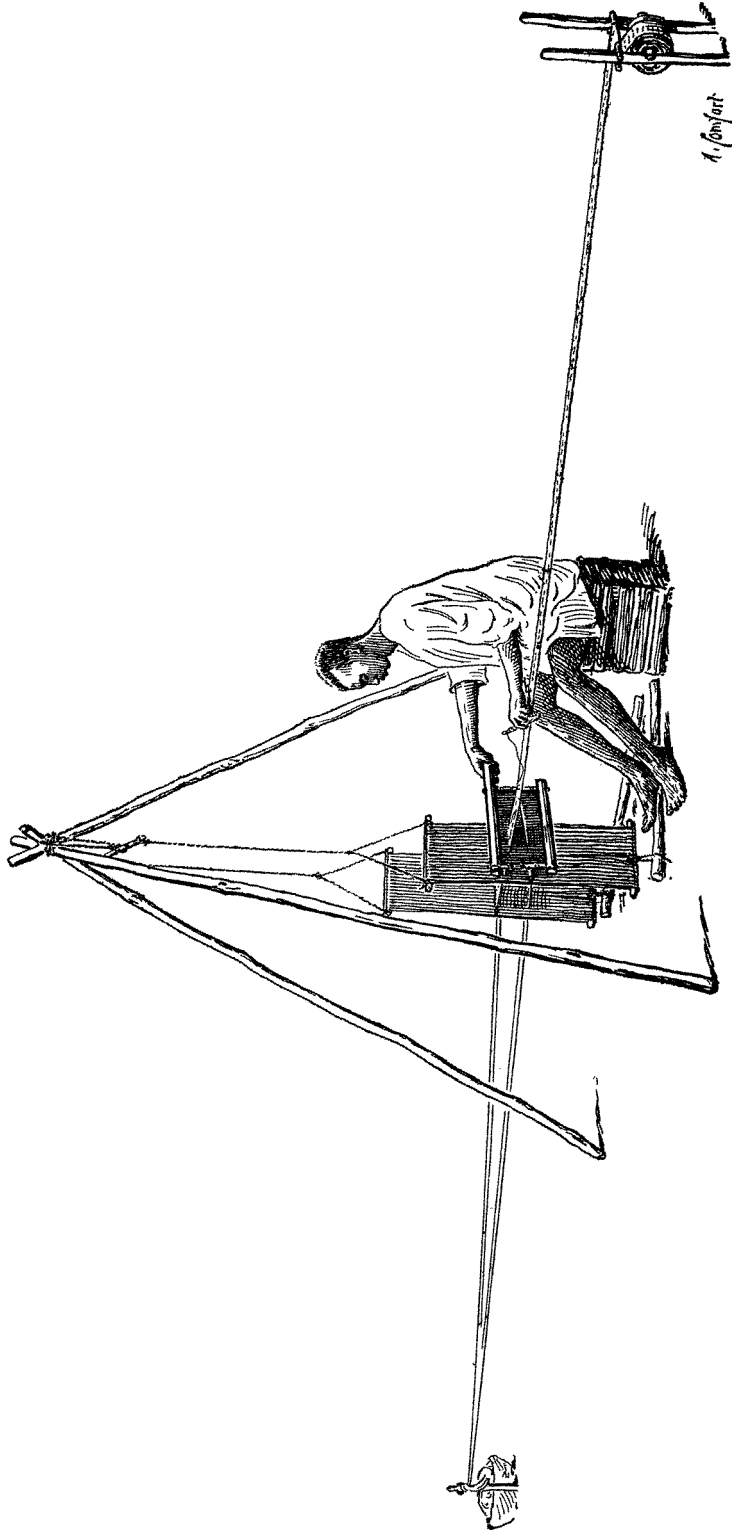
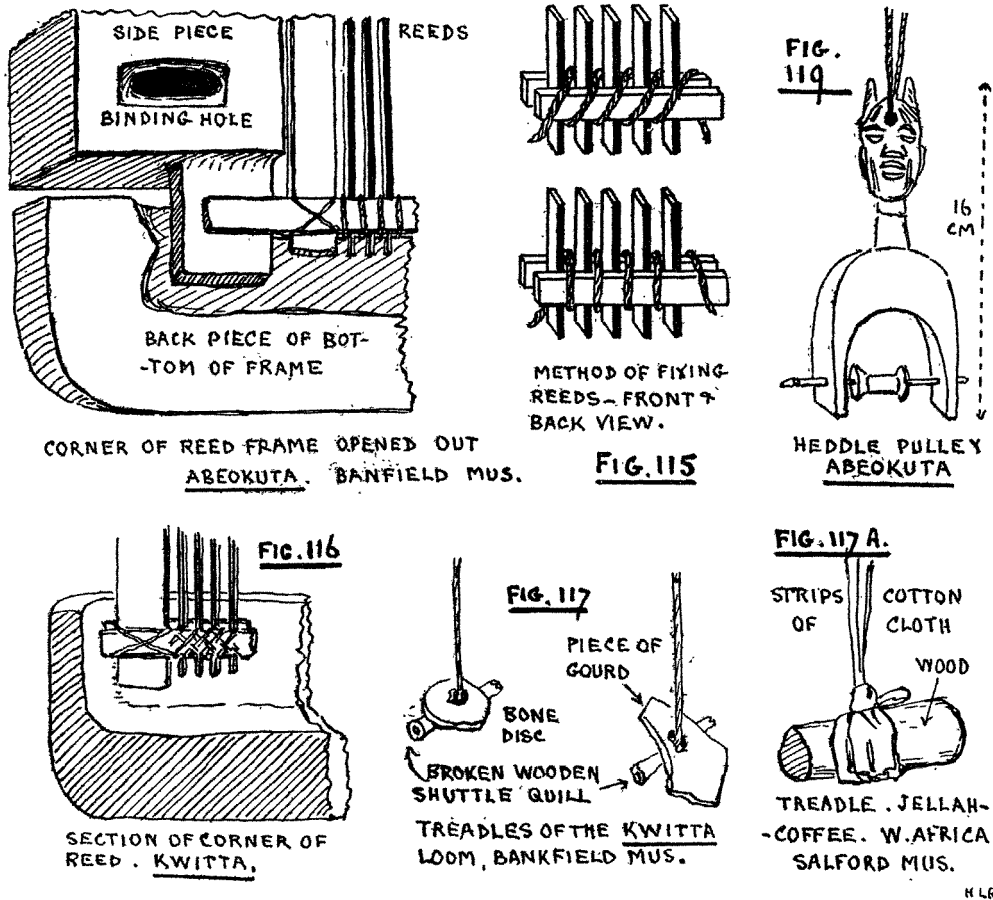


FIG. 110. HORIZONTAL NARROW BAND LOOM—TRIPOD FORM. FROM A SPECIMEN IN BANKFIELD MUSEUM FROM TIKONKO, MENDE, SIERRA LEONE (REV. W. T. BALMER, 1904) + A PHOTOGRAPH.

frequently an old sewing yarn reel (or bobbin). The leashes of the heddles are mostly of twisted cotton. A shuttle is in use, and frequently it is *not* provided with a weft paying-out hole. The warp beam's place is taken by a heavy stone or anchor, while the breast beam consists of a thin cylindrical stick on which the cloth is wound by means of a wooden pin passed through the end, the point of which presses against the seat of the weaver to prevent unwinding. The heddles are drawn downwards by means of cords which end in a wood or bone disc or a short transverse piece of wood, which is grasped between the big and second toes of



CORNER OF REED FRAME OPENED OUT
ABEOKUTA. BANKFIELD MUS.

FIG. 115

HEDDLE PULLEY
ABEOKUTA

FIG. 116

SECTION OF CORNER OF
REED. KWITTA,

FIG. 117

TREADLES OF THE KWITTA
LOOM, BANKFIELD MUS.

FIG. 117 A.

TREADLE. JELLAH-
COFFEE. W.AFRICA
SALFORD MUS.

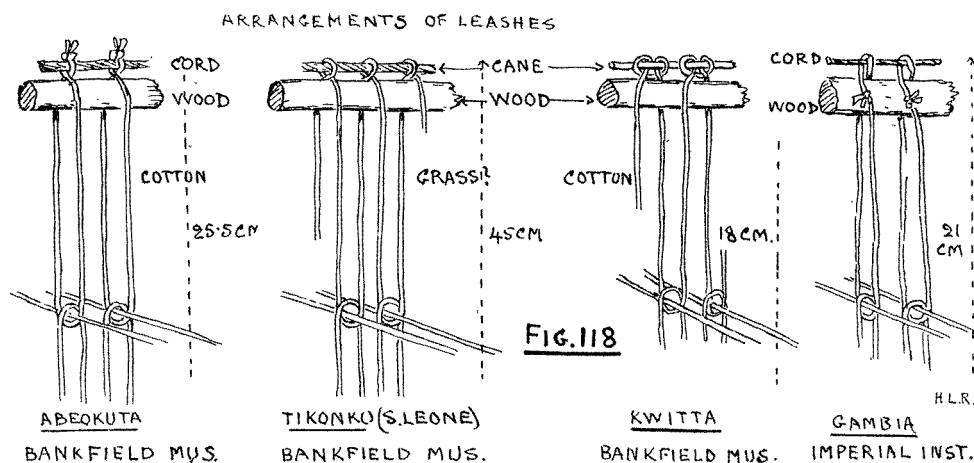
H.L.R.

the weaver, Figs. 117, 117A, or in some cases the cord ends in a loop into which the weaver inserts his big toe. The weaver sits facing the breast beam.

The student naturally compares this loom with our own hand looms, and it has some resemblance to the broad, well-developed hand loom which is found the whole length of North Africa, inclusive of Egypt. But if the similarity be there, then also we must admit that this African loom is a very degenerate representative, judging by the complete specimens in Bankfield Museum, in the Liverpool Museum, and by the portions to be found in our museums elsewhere. The frames are

extremely flimsy, ill-fitted together, and slovenly rather than crude in their details. The frequent omission of a pay-out hole in the shuttle is very probably a sure sign of decay. On the other hand, it is doubtful if the connection making the corner of the better sort of reed in Fig. 117 can be considered anything but of very recent origin, and not by any means African.

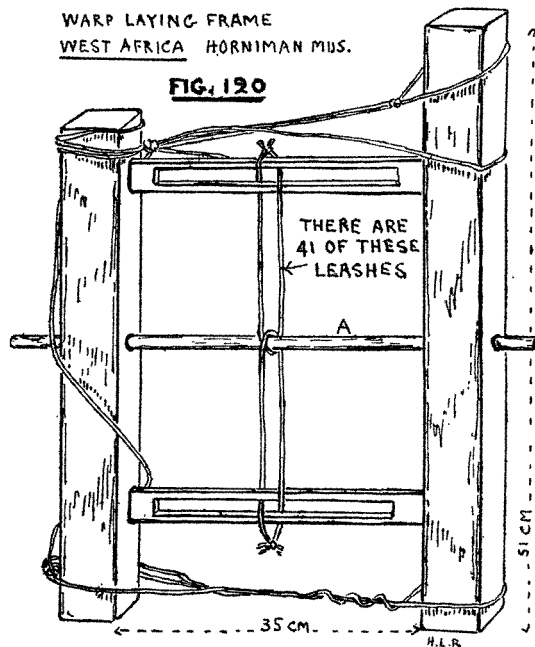
Perhaps still more degenerate is the tripod form, Fig. 110. In this the reed and treadles are suspended from the jointing of the three poles which make up the tripod. It is further characterized by an extension of the upper portion of the reed into a handle, Fig. 109, which is grasped in the right hand of the weaver, who sits on the right-hand side of the web and not with his work straight in front of him. Why the weaver should take up such a position is not obvious, for one would



think that the beatings-in by the reed would have a tendency to get away from the right angle to the warp, but I am unable to trace any such irregularity in the fabrics examined. Owing to the absence of wooden side pieces, the reed is anything but rigid. The heddles are supported from a whipple tree; the leashes are of fine twisted grass or similar filament. The cords drawing down the heddles are attached to one end of each of two sticks (the treadles), the other two ends touching the ground, which gives the sticks an oblique position. Judging by illustrations of negroes at work, the weaver does not keep his feet one on each treadle, but uses one foot alternately for both treadles. The place of the warp beam is taken by a post fixed vertically in the ground, and the yet-to-be-used warp is rolled partly round it and placed in a basket at the side. The web is wound round a horizontal stick (what would otherwise be the breast beam) placed against a pair of uprights; but I am not conversant with the details. A spool of the A1 type is used and *not* a shuttle, and, like the rectangular loom, it is tended by men weavers only.

In connection with this loom we have an interesting specimen of the Warp-Laying Frame in the Horniman Museum, Fig. 120. It consists of a frame of which the two uprights of roughly squared soft wood are connected by two

transverse flat pieces of wood, each of which is provided with a longitudinal slot. As near as possible to the middle of the frame a thin rod of wood, A, is inserted through the uprights parallel with the flats. A strip of leaf is then taken, bent at its middle over the bar, and its ends woven through the slot in the lower flat and knotted together below. A similar strip of leaf is passed through the loop of the first strip bent under the bar, its ends passed upwards, woven through the slot of the upper flat and knotted together above. This work is repeated until the frame is full of these leashes—in this frame there are 41 double leashes—whereupon the bar is removed and a separate warp thread laid through every space, between the bends in the leashes, left vacant by the bar. The two uprights are then knocked off and the two slotted flats and leashes and warps transferred to the heddle frame ready for weaving.



Length from top to bottom over all of slotted bars 12 inches, 30.5 cm., width between two posts 10 inches, 12.5 cm.

J. Büttikofer informs us¹ that as the weaver "proceeds with his work he pushes the *whole* of the apparatus forwards to the right, the warp not being moved at all." The immovable warp is a characteristic of some of the fixed heddle looms (see Figs. 89 and 89A), but whether the women of Neh, in the extreme eastern part of Persia near Afghanistan, move forward their tripod frame, the warp remaining in position, or whether Singalese weavers, who also use a tripod frame, do so or not, I have not been able to ascertain, but I think

the tripod must be moved forward in all cases where the warp and breast beams are pegged to the ground, and the warp is not continuous.

The tripod is found in other parts of Africa besides the West. Miss A. Breton writes me: "At Luxor, in the market, I saw [in 1909] a man weaving with a most primitive gipsy kettle contrivance—three legs like a gipsy kettle—the result was as good as could be wished." In the course of ages a similar tripod loom may have travelled across the Continent, meeting in the more western portion of West Africa with the loom which Dr. Harrison has suggested that the Portuguese possibly introduced in the sixteenth century²; the two gradually merged into each other, giving us the oblong frame with a fair reed, Fig. 108, in the more western portion

¹ *Reisebilder aus Liberia*, Leiden, 1890, ii, p. 283.

² *Horniman Museum Handbook*, "Domestic Arts," Part II, p. 50.

and keeping the tripod with a poorer reed, Fig. 109, in the more eastern portion, but in both cases adopting the harness for the heddles and treadles. This would account for the noticeable degenerate appearance of the looms. This view also coincides with that held by Sir H. H. Johnston,¹ in so far that the loom is not indigenous here, but was introduced from the East, and was primarily due to the advance of the Arabs in the ninth century A.D.

5. *The Pit Treadle Loom.*—This is the common Hindu loom at which the weaver sits on the edge of a specially constructed hole in which his feet work the treadles, and is rather a method of working a loom than a distinct form of loom. It is met with largely in the green mountains district of Oman, Arabia, half-way between India and Africa. Colonel S. B. Miles in describing it,² says: "The weaver sits and works at it in a shallow pit, with half his body below the surface." In Africa it is found among the Gallas³ and contingent peoples. In Bankfield Museum we have a fringe-making loom, the gift of Mr. Wm. Myers, lecturer in the Manchester Municipal Technical School, which was obtained near Khartum by Mr. C. S. Rhodes, and in forwarding the specimen Mr. Rhodes sent a sketch showing the native weaver seated with his feet in a hole working the treadles.

6. *The Mediterranean Loom.*—I call this form the Mediterranean loom for want of a better name. It is the usual rectangular heavy framed loom with roller warp and breast beams, very similar to that of our few remaining hand weavers.

It appears to be distributed along the north coast of Africa from Algiers to Egypt, and, perhaps, somewhat up the Nile Valley, although the illustration in Dr. John Garstang's work⁴ seems to depict a loom of a different type. Neither, however, has the warp bunched together over the head of the weaver and weighted behind him, as is the case in Syria.⁵

Like the pit treadle loom, it cannot in any way be considered African.

7. "*Carton*" *Weaving.*—This method of obtaining bands, girdles, sashes, etc.—*i.e.*, more or less narrow fabrics—can, strictly speaking, hardly be called weaving. Its former use in Egypt has been so well described and illustrated in a sumptuous work⁶ by Messrs. A. van Gennep and G. Jéquier that it need only be referred to here. In his *Études* already referred to (see p. 141) van Gennep gives the distribution of this tool as extending along the north coast of Africa from Tangiers to Tunis inclusive and on the banks of the Lower Nile.

The Map.—In the accompanying map, Fig. 121, I have endeavoured to convey to the student some idea as to the distribution of the various forms of looms found

¹ *Liberia*, London, 1906, ii, pp. 1016-18.

² *Geog. Journ.*, November, 1900, xviii, p. 475.

³ F. J. Bieber, *Globus*, March 8th, 1908.

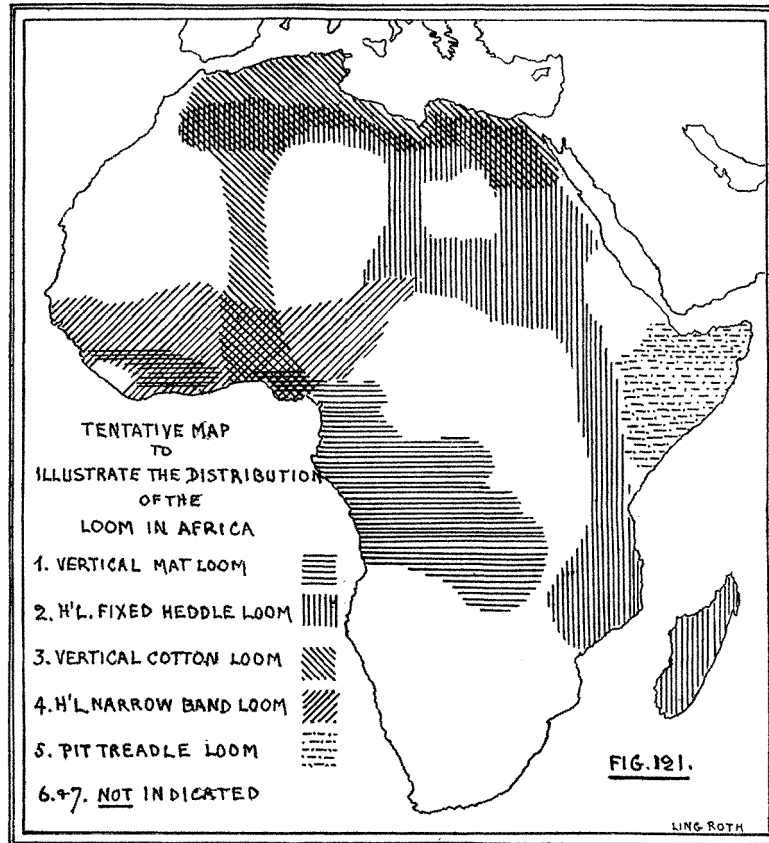
⁴ *The Burial Customs of Ancient Egypt*, London, 1907, Fig. 133, p. 134.

⁵ I gather this characteristic from illustrations of Syrian looms, kindly sent me by Dr. Harvey Porter, of the American Baptist Mission, Beirut.

⁶ *Le Tissage aux Cartons et son utilisation décorative dans l'Égypte Ancienne*, Neuchatel, Suisse, 1916.

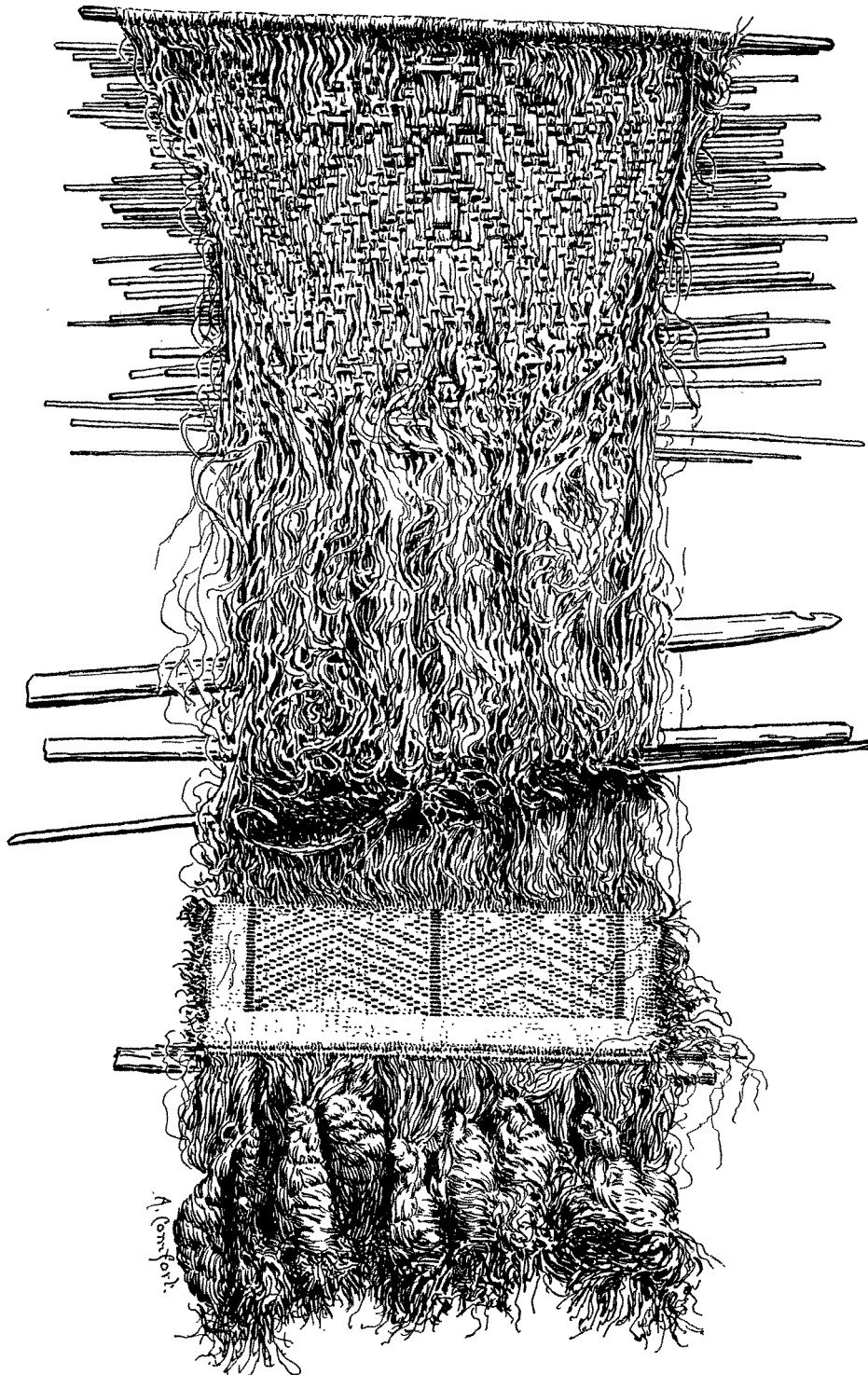
in Africa at the present day. The attempt must be regarded as strictly tentative only, for, while the main positions are, I think, fairly correctly placed, details of the extension of each individual form are still lacking.

With the exception of the vertical mat loom, which may possibly be indigenous to the heart of Africa, but about which we have not sufficient evidence to decide at present, and of the vertical cotton loom, which may have had its birth



in Egypt, all the other five forms are introduced. The fixed heddle loom appears to have entered Africa both in the north-east *via* Arabia and in the south-east *via* Madagascar. The horizontal narrow band treadle loom came possibly from Portugal, and the pit treadle loom was probably imported from India *via* Arabia. The Mediterranean or Asiatic treadle loom and the "carton" loom probably found their way in *via* the Mediterranean, if the latter was not indigenous to Egypt.

[Part III, "Indonesian Looms," to follow.]



OKALE (BA-HAMBA) LOOM. BRITISH MUSEUM (E. TORDAY).

STUDIES IN PRIMITIVE LOOMS.