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A CONTRIBUTION TO THE STUDY OF THE MUMMY BLANKETS FROM PARACAS

With remarks on Danish Bronze Age textiles

by

† Margrethe Hald, Copenhagen

AT THE MAGDALENA MUSEUM IN LIMA, PERU

MUMMY BLANKET NO. 290-27.

Measurements: length 17.50 m.
width 4.60 m.
Material: cotton.
Colour: plain brown.

The textile is very well preserved and its four edges are intact. At the selvedges the weft thread passes directly from shed to shed. Along the transverse edges there is a firm edging of three stout cords (heading cords), which carry the warp. Each cord consists of six two-ply threads which are S-spun and Z-plied. The warp is laid for tabby weave round the three cords, i.e. passing over one, beneath the next, and round the third outermost one. Some fairly homogeneous flaws or holes are noticeable on both transverse edges, probably from eyeletting or tying to a rod, or the like. The distance between the holes is about 4.5 cm-6 cm. The draft of the textile is tabby, and it can be assumed that the warp was divided into two sheds during the warping process, namely one shed for a shed cord, and one for a heddle. The yarn of the warp and weft is two-ply and Z-plied. The warp threads are so compact that they practically conceal the wefts, and the textile has almost the character of repp. An analysis of a number of test patches was carried out to determine the quality of the fabric:

86 warps and 31 wefts to 5 cm × 5 cm at approximately the centre of the textile.

Counts elsewhere yielded: omk. 300 B.C.
74 warps and 29 wefts.
86 warps and 33 wefts.
74 warps and 34 wefts.
76 warps and 35 wefts.

The surface of the fabric has certain peculiarities that recur with a regularity which cannot be due to chance or to carelessness on the part of the weaver, therefore, there must be some technical explanation for them.

Two different phenomena can be observed in the weft. Firstly some weft threads meet in pairs and form a cross where they change from one shed to another. The threads have been passed towards each other, exchanged and continued to the edge. This results in small crosses which are barely distinguishable in the tightly woven surface. Secondly, certain weft threads – evidently at random – break their passage, turn, and pass back in the following shed. The turns are closely packed together, they appear to turn at random this way and that. This detail is likewise not easily discernible and can easily be overlooked at first glance.

MUMMY BLANKET NO. 49

This textile is undoubtedly very closely related to the blanket described above, although it is not as well preserved. It had to be spread out on the floor at the Magdalena Museum in order to be

Van Stan, Ina: The Fabrics from a Peruvian Mummy Bale found beneath the Pachacamac Temple. Lyon. 1964 (fra kartoteksskuf) Bulletin No. 19. Centre Int. d'E T.A.

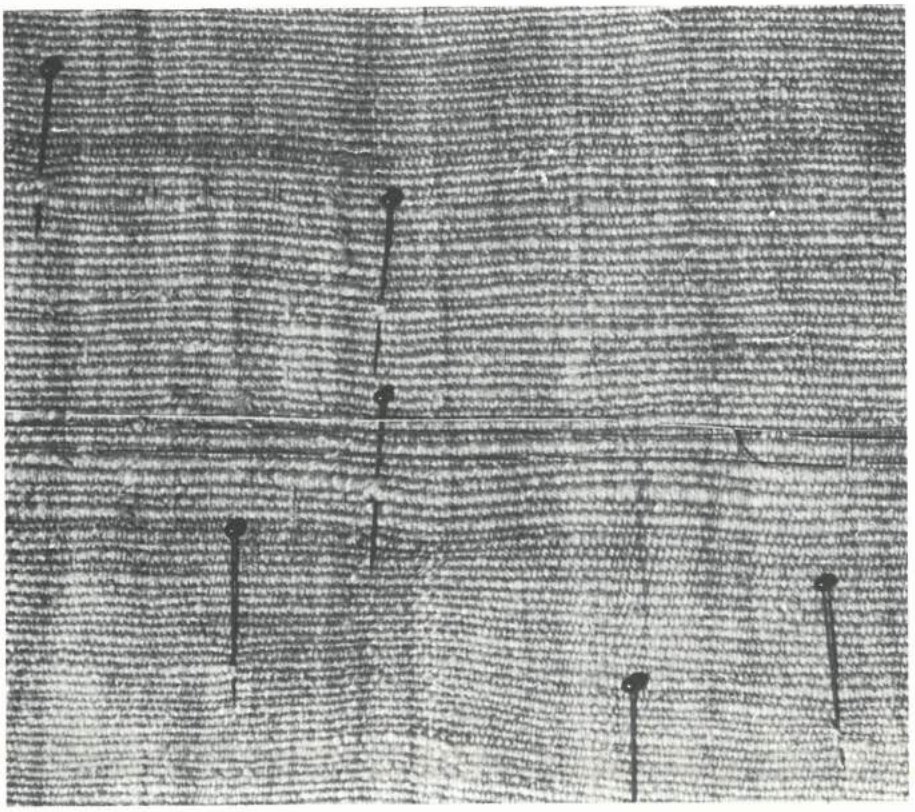


Fig. 1. Detail of mummy blanket no. 290-27. The crossing weft threads are marked with pins. (M.H.).

studied in its entirety. It is a large, rectangular blanket with four intact selvedges. The textile is therefore a complete woven piece. It measures c. 26.5 m × 3.5 m.

At first glance it appears to be an unremarkable tabby weave, although unique due both to its impressive size and other characteristics, one of which being the pattern effect produced by lengthwise stripes in nine groups. Each group comprises one dark stripe in the middle flanked by two paler stripes. The differences in shades are presumably due to the natural brown nuances of the cotton.

The yarn of the warp and weft is two-ply, i.e. Z-plied. The warp threads are considerably finer than the wefts, but they are closer together. The thread count of a 5 cm×5 cm patch is 92 warps and 22 wefts, and this surplus of warps gives the textile a repp effect, also accentuated by the fact that the weft is often double in a shed (1).

According to the information I received at the Magdalena Museum, blanket no. 49 was earlier examined by textile experts from the United States in 1949; its measurements in feet were 87½ ft in length and 11 ft 3 ins in width. A C-14 test made by Dr. W. F. Libby in 1950 dated the textile to 307 B. C. ± 200 years (2).

The reason for studying the two blankets together, viz. nos. 49 and 290-27, as in the present article, is not only because of their immediate impression of similarity but also because of deeper-lying characteristics. 1) Weft threads in the longitudinal edges turn and pass directly into the next shed. 2) Two weft threads meet here and

(1) Examined with the kind assistance of Professor Julio Espejo Nuñez.

(2) Junius Bird: "*Paracas Fabrics and Nazca Needlework. 3rd century B. C. - 3rd Century A. D.*", Washington 1954, pp. 10 and 16.

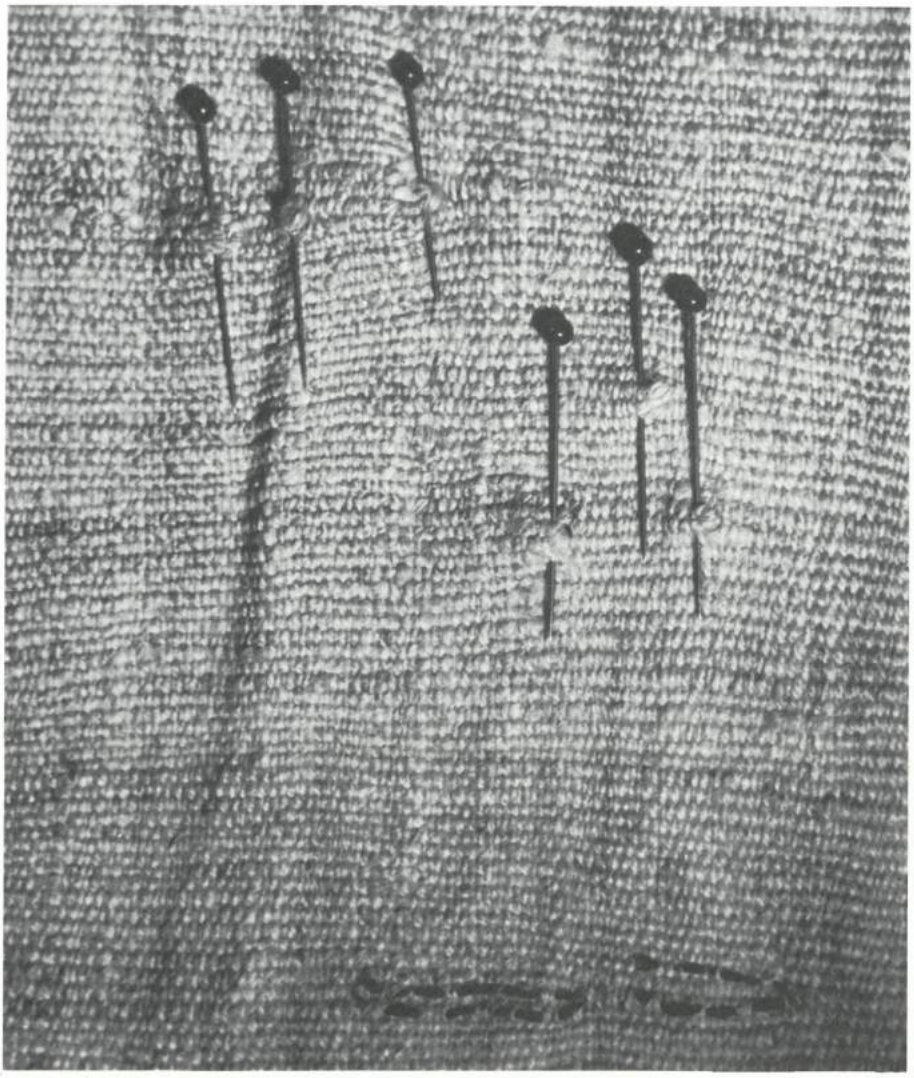


Fig. 2. Detail of mummy blanket no. 290-27. Turns and crosses in the weft. (M.H.).

there in the same shed, cross and continue in the next shed. 3) A weft thread suddenly breaks off its course and returns in the following shed (see Figs. 3, 6 and 7).

How should these details common to both blankets be interpreted? Both textiles belong to a large group of Paracas fabrics which, due to their size and state of conservation, are unique in the field of primitive weaving. With good reason, they have aroused great interest and admiration in research circles, and a number of scholars have tried to solve the mystery of how they were produced. I am also intrigued by the problem. In 1962 I put forward some views concerning South American textiles in a monograph entitled: "An Unfinished Tubular Fabric from the Chiriguano Indians", that have a bearing on the present subject (3).

In 1954 Junius Bird, the American archaeologist, wrote: ". . . Since the whole shed did open at once in Peru, there are a few instances where many weavers must have worked side by side, for

(3) Margrethe Hald: "*An Unfinished Tubular Fabric from the Chiriguano Indians, Bolivia*". The Ethnographical Museum of Sweden, Stockholm, 1962, p. 38 ff. and 46 ff.

weft - cross - sl. P. Collingwood 1968.
The technique of Rug-weaving
p. 114 ff.

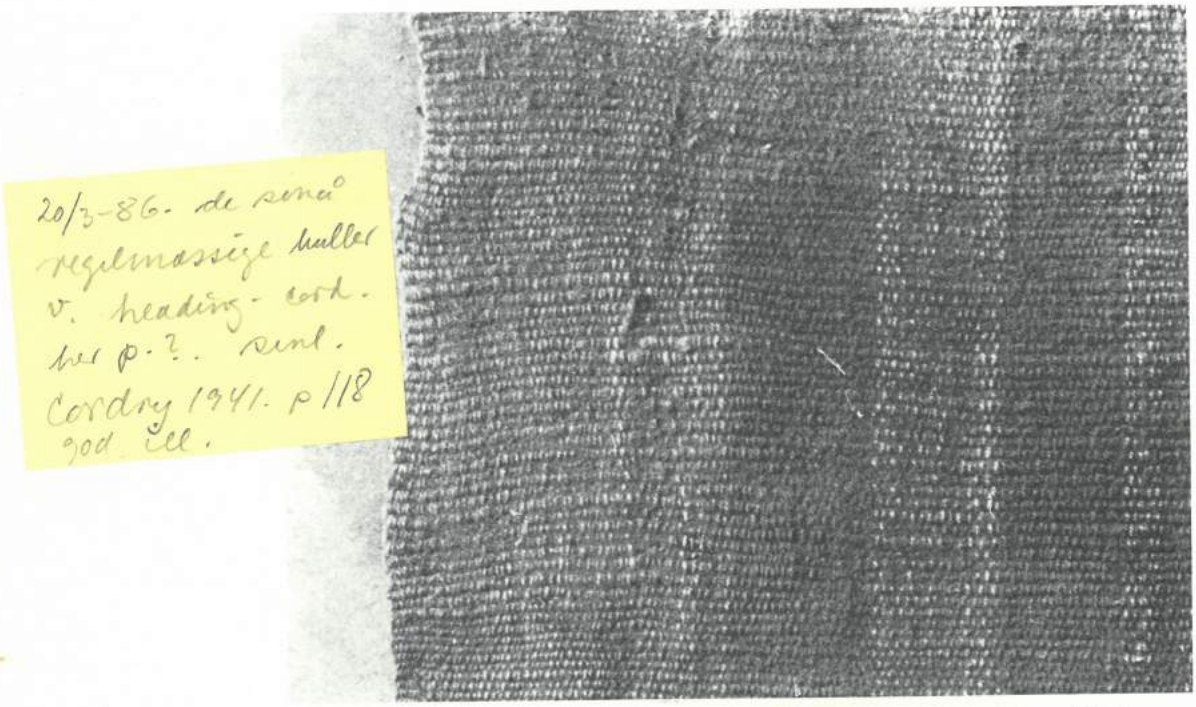


Fig. 3 Detail of mummy blanket no. 49. Selvedge and part of the striping. (M.H.).

fabrics have been found with a loomwidth of 5.37 m"(4). Already in 1936, Lila M. O'Neal was greatly preoccupied with the mummy wrappings from the Paracas Necropolis. She relates that in 1932 the Museo Nacional in Lima received a large bundle of mummy textiles. It was unpacked by two scientific assistants attached to the museum, and each step of the proceedings was recorded. Among the large pieces from Paracas mummy no. 217, one specimen was more closely described including the following: "... it was possible to follow the yarns of the weft the whole distance of the width of the weaving (230 cm), and to establish that they bent at the edges to return in the ordinary manner. It was evident, then, that in the present case no extra yarns had been introduced" (5).

This establishes that only one weft thread was worked in the same shed but by several people. The problem of *how* it is possible to open the same shed across the full loomwidth and divide it among the weavers has not been solved. However, Lila O'Neal comes close to a solution when she continues later that: "... there may have been some such division of the Early Nazca heddle into short lengths so that each of the several weavers could manipulate her own length." (6). That she is aware that leashes were known in ancient Peru during the Paracas Caverns Period is evident from a remark in her treatise in 1942, where she mentions an example, namely an incomplete band-woven textile at the Museo Nacional in Lima (Specimen 8465a), about which she writes: "... each loop makes a simple turn around the particular warp it controls in the shedding" (7). No heddle rod is mentioned, but no conclusions can be drawn from this because the warp in this particular case would be fairly narrow, and a heddle rod – if ever together with the product – has not survived.

It would be interesting to know whether Lila O'Neal knew of the primitive loom put up with a

(4) Junius Bird: op. cit. p. 94.

(5) Lila M. O'Neal: "*Wide-loom Fabrics of the Early Nazca Period*". University of California Press, Berkeley 1936, p. 216.

(6) Lila M. O'Neal: op. cit., p. 219.

(7) Lila M. O'Neal: *Textile Periods in Ancient Peru II, Paracas Caverns and the Grand Necropolis,* 1942, pp. 151, and 187.

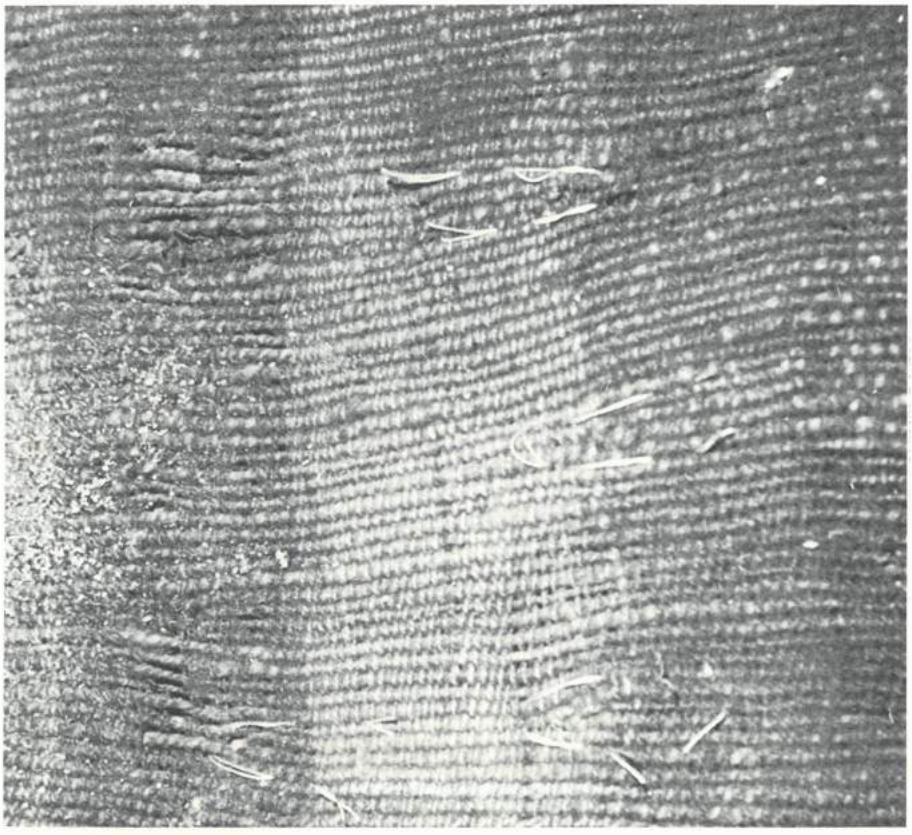


Fig. 4. Detail of mummy blanket no. 49. Turns and crosses in the weft, marked with white sewing cotton. (M.H.).

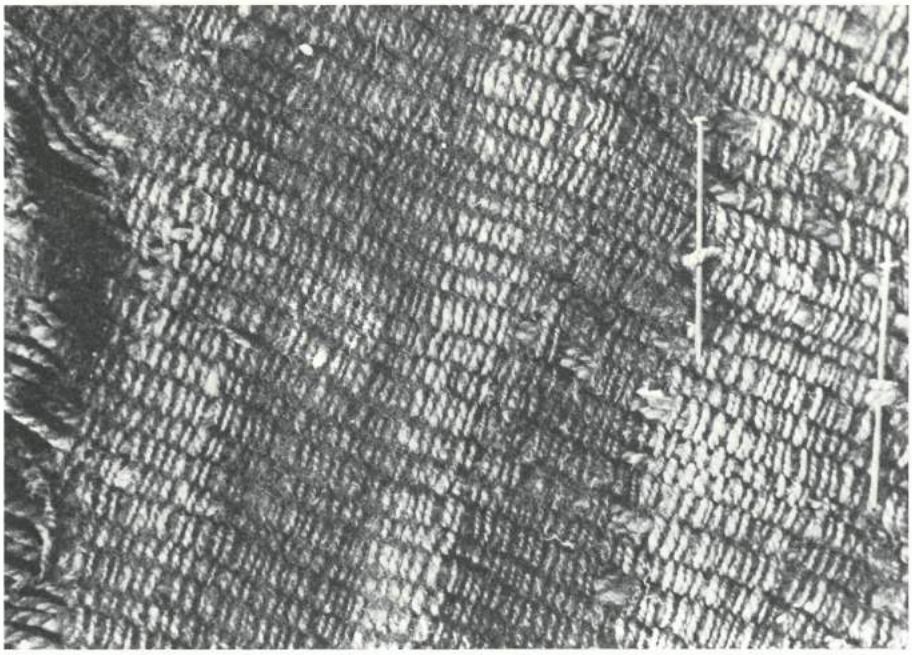


Fig. 5. Detail of mummy blanket no. 49. Crossing weft threads heavily magnified. (M.H. .

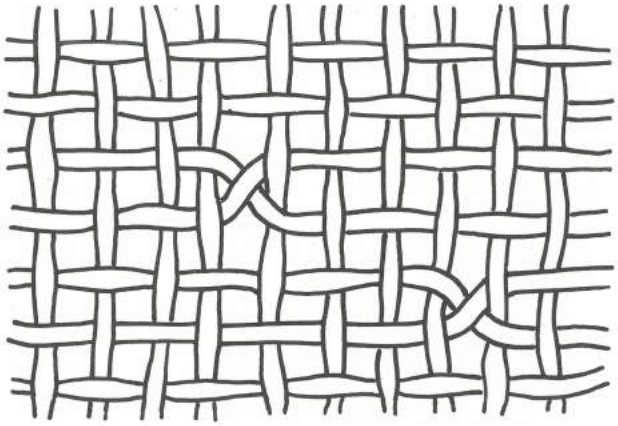


Fig. 6. Draft of crossing wefts.

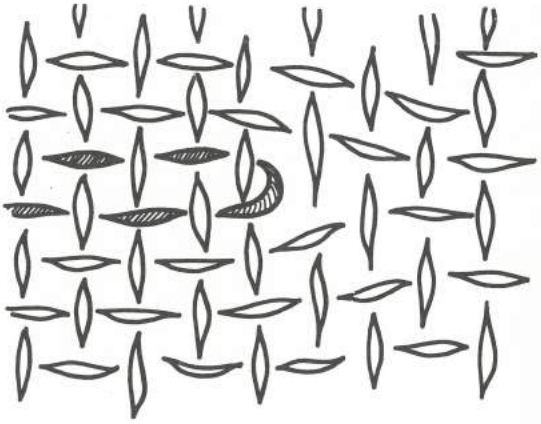


Fig. 7. Draft of turning wefts.

free heddle in the present century in South America. If this had been the case, she would have perhaps found the answer to the mystery she was so close to solving.

The free heddle is an arrangement whereby the leashes are not carried by a rod but are a flexible chain which can be moved up or down in small sections by hand when opening a shed: a contrivance well-suited also when two or even more weavers are at work at the same time at the same loom.

An example of a heddle of this kind is illustrated (Fig. 8), and the technique demonstrated (Fig. 9 a-b-c). It is difficult to say whether the method has originated in South America, but there are indications that it has. In any event, I first learnt of its existence through a Bolivian loom which derived from the Chiriguano Indians. The loom is now at Statens Etnografiska Museum in Stockholm, to which it was given in 1909 by Erland Nordenskiöld, the great Swedish explorer-scholar, who at the same time handed over a photograph of the loom taken in situ (Fig. 10).

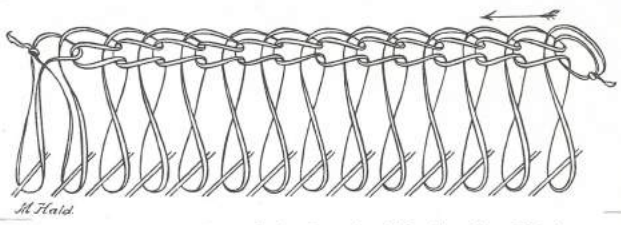
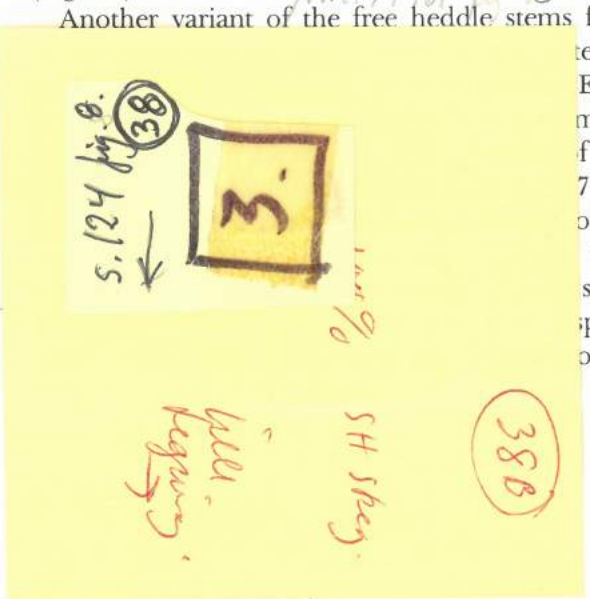


Fig. 8. Reconstruction of the free heddle for the Chiriguano loom.

The photograph shows the thin shed rod dividing the warp threads evenly about one-third down the face of the warp. A little further down, at a comfortable level for the weaver, the free heddle can be seen, its leashes run in a slightly wavy line across the warp, and it is long enough to be moved up and down the warp with ease. The loom, therefore, has the two elements necessary for shedding when weaving tabby (cf. Fig. 11., photograph of the same loom at the Etnografiska Museum).

The Chiriguano heddle is not unique, for Walther E. Roth observed a very similar method, though more simple, among the Wai-wai Indians in Guiana, and he published details of their method of leash knotting with diagrams in 1916-1917 (Fig. 12). W. E. Roth also included a diagram to demonstrate how the yarn for the leashes was unwound and knotted in an unbroken length for the shedding process with one ball of yarn (Fig. 13).

Another variant of the free heddle stems from



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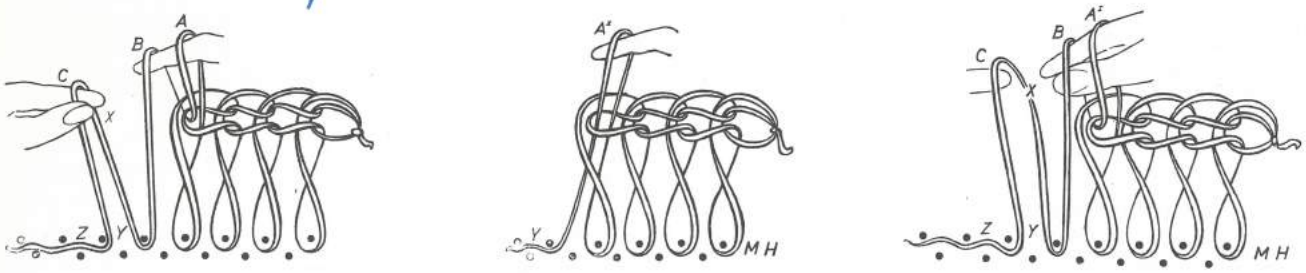

Fig. 9. a-b-c. Different stages in leash knotting for the free heddle in Fig. 8.

weaving in their own environment (8). Firstly, two women of the Wapisiana tribe weaving side by side. The weaver in the foreground is in the act of pulling a section of warp threads forwards by lifting the heddle leashes with her right hand, and supporting the shedding with her left hand. At each side of the section she is currently working on, we see the free heddle extending in a wavy line across the warp, clearly demonstrating the necessity of extra length in relation to the width of the warp when this special working method is adopted. The second photograph shows two Motilon women working together at a loom, the one in front has just picked up some warp threads on the sword, and the heddle leashes momentarily out of use are pushed up the warp in an arc.

A Macoa woman (8a) is shown at work with an extra long, free heddle. With her left hand she is engaged in bringing one shed down from a shed cord visible above, to the left in the photograph. The other shed is controlled by a short sword. She squats in front of her upright loom. The reason for pushing up the heddle from the working edge is to bring the countershed forward and avoid friction when the sheds are being changed. It is precisely this part of the procedure which necessitates a long free heddle which can be pushed up in small sections at a time. Another photograph of a Motilon woman (Macoa Indian) shows her working alone (Fig. 15). She also squats in front of the loom. There seems to be, then, good reason to believe that the free heddle is deeply rooted in the weaving traditions of South America, no heddle rods are to be seen.

What other points of resemblance support our assessment of the Paracas blankets? The small crosses in the weft, mentioned earlier, are particularly significant because they represent *the evidence* to prove that two or more people worked simultaneously at a loom, and that *each had a weft thread* to pass through the warp. Collaboration is the prerequisite to ensure that sheds are changed in line, and that contact in pairs between partici-

(8) See Margrethe Hald, note 3, pp. 25 and 33.
(8a) Op. cit. p. 49, fig. 42.

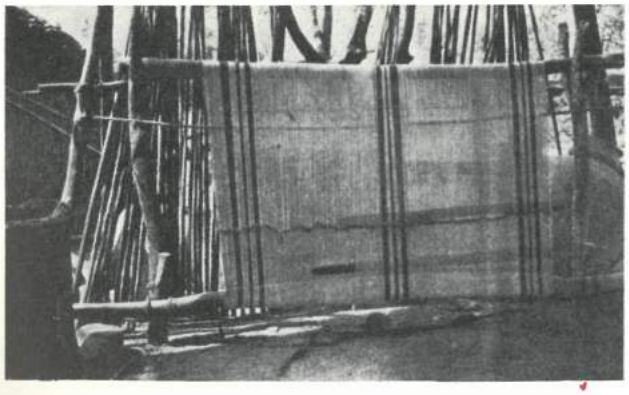

Fig. 10. Loom from the Chiriguano Indians. (E. Nordenskiöld).

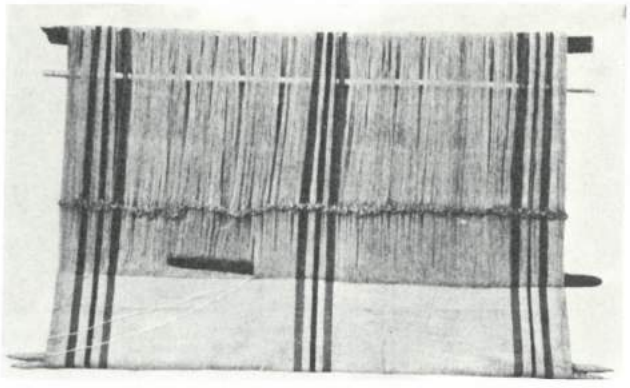

Fig. 11. The Chiriguano loom with free heddle. (Statens Etnografiska Museum, Stockholm).

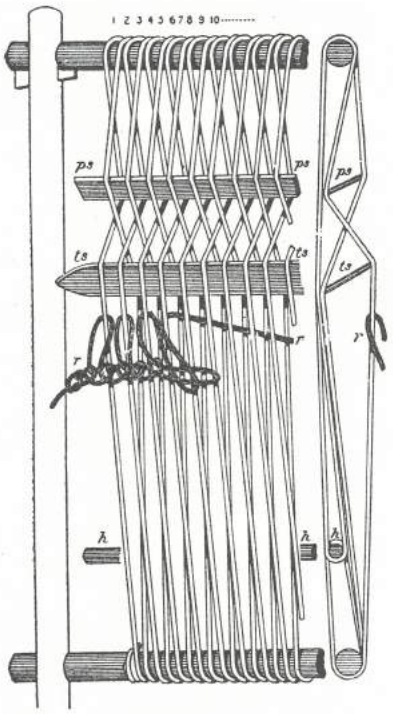

Fig 12. Loom with leash knotting for a free heddle being done among the Wai-wai Indians. (After W. E. Roth).

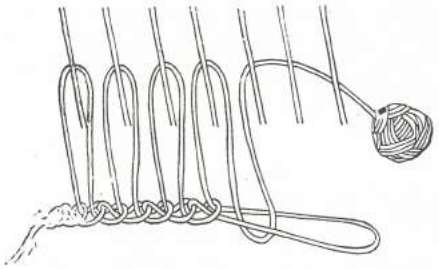

Fig. 13. Diagrams showing the method of leash knotting for the heddle in Fig. 12. (After W. E. Roth).

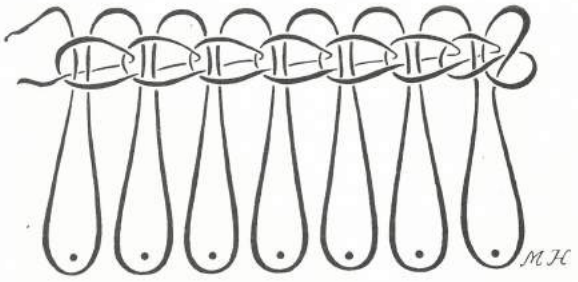

Fig. 14. Heddle of the Mataco Indians. (Statens Etnografiska Museum, Stockholm).

pants controls the over-all progress. A pair of weavers have to work alternately towards each other and away from each other. When their hands meet they each change sheds and continue away from the point of intersection. Theoretically speaking, the crosses should delineate regular boundaries between the sections worked by different weavers, but it is easy to imagine that not all the participants were equally skilled or quick, and this would explain why the occurrence of crosses in the weave of the Paracas blankets is slightly irregular.

When weaving a textile in this fashion, the individual weaver cannot bring forward a shed in her section in one move. It has to be lifted in small portions and the weft thread passed through successively. If it were possible to follow one particular thread stage by stage across the face of the warp, from side-edge to side-edge, the number of weavers could be counted according to the number of crosses, viz. there would be one more weaver than the number of crosses, (cf. the thread marked in Fig. 16).

In the present context it seems reasonable to look for similar characteristics in other groups of ancient textiles preserved elsewhere throughout the world. The method with wefts meeting and intersecting has been identified in the linen tunics from the Coptic period in Egypt, (9) and in the woollen garments and blankets from the early Bronze Age in Denmark. Among the latter is a blanket 1.84 m×1.33 m from Trindhøj (10). Admittedly, it is of modest size compared with the widths of the Paracas blankets, e.g. 3.50 m and 4.60 m. But their common link is convincingly illustrated by the crossing weft threads.

The next point to discuss is the detail in the Paracas blankets where the individual weft thread passing through one shed, suddenly turns and passes back again in the next shed. The turns form small points or arcs lying at random, they are

(9) Margrethe Hald: "*Ancient Textile Techniques in Egypt and Scandinavia.*" Acta Archaeologica, 1946, p. 49 ff., figs. 16 & 19.

(10) H. C. Broholm & Margrethe Hald: "*Costumes of the Bronze Age in Denmark*", 1940, fig. 38-39, Copenhagen.

subordinate to the tabby weave and appear to cause no difficulty as the tabby draft continues – but we may well ask how?

It would be useful if some connection between the two convergent weft turns could be identified. It is a point I am unfortunately unable to shed light upon because the closely woven cloth made an analysis of this nature far too uncertain.

Therefore, the problem is whether similar characteristics are identifiable among other prehistoric textiles. In the collection of Danish Bronze Age textiles there is a man's mantle from Borum Eshøj which has a detail with a draft that seems to have a bearing on the Paracas turns. The diagram (Fig. 18) is based on a specially selected part of this primitively woven fabric (11).

It shows that two wefts have been worked in a local zone, and that these cross each other near the centre of the zone. They then continue a little distance before turning, passing inwards again, and crossing. This is repeated a few times, after which the two wefts join the main weave. A good example of turns in the weft to each side is in one of the Coptic tunics (12). The diagram demonstrates how a small zone can be independently woven in an otherwise large piece of work (13). A similar characteristic may be concealed in the Paracas blankets.

The reason why several scholars reached the conclusion that the large Paracas textiles were woven with a through-going weft across the full

Fig. 15. Motilon woman at a loom with a free heddle. (University Museum, Philadelphia).

width is presumably because, as already mentioned, the turns of the weft from shed to shed at the selvedges seem to be straightforward (Fig. 3).

No-one seems to have thought that these selvedges would look just like this even should more than one weft thread be used according to the "crossing method".

Both Lila M. O'Neal and other textile experts have tried to draw parallels between the primitive looms and weaving methods of various peoples, such as the Navahoes, the Araucanians, and the Orientals. The loom of the Bedouins of the Upper Nile has also been discussed (14). The latter could

(11) H. C. Broholm & Margrethe Hald: op. cit., fig. 65.

(12) Margrethe Hald: op. cit., figs. 18-19.

(13) Margrethe Hald: op. cit., fig. 20.

(14) Lila M. O'Neal: "*Wide-loom Fabrics of the Early Nazca Period*", p. 19.

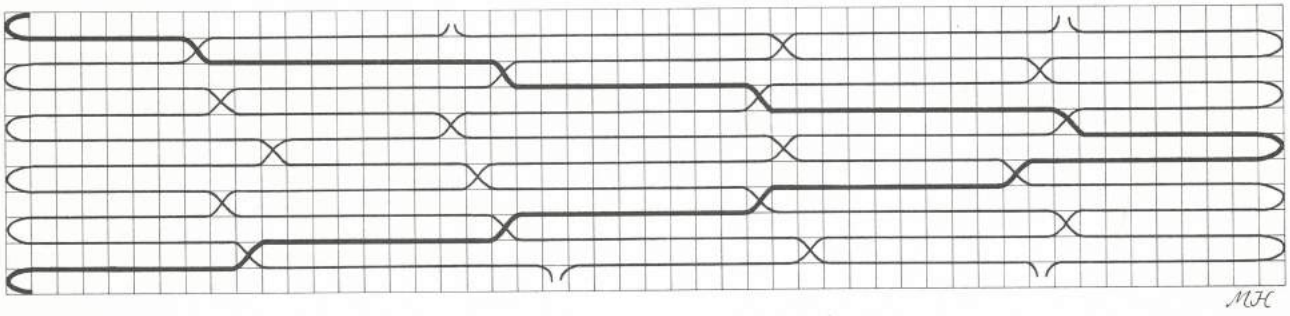

Fig. 16. Hypothetical proposal for the weft course in the mummy blankets. Four crosses correspond to five weavers.

se dias (K-H) "MH (563) 129" m. fl.

Fig. 17. Two Fellah women at work. (M.H.).

well be termed *ground loom,* it is well worth studying more closely *if we ignore the fact that it has a heddle rod.* The horizontal Bedouin loom produces fairly long but rather narrow textiles. The warp is laid round two sturdy beams fastened to some low posts at ground level, the distance between the latter corresponds to the length of the textile to be woven. During the weaving process the weaver sits *on the product,* viz. she moves forward as the fabric is woven. The heddle gives one shed, and the other shed is kept behind a shed cord, sometimes a rod. From here, the weaver pulls the shed forward by hand in front of her, she inserts the sword, turns it edgeways and passes the weft through the resulting gap. Usually the work is done by one weaver across the width of the warp, but I have seen cases where two women worked side by side at a loom of this kind, cf. the two Fellah women in the area south of Hebron in Jordan, 1961 (Fig. 17).

If we return to the Paracas textiles, dare we consider the hypothesis that these were woven with the simplest of aids by the same method as that used by these Bedouins? For which the supporting element to both the fabric and the seated weaver is the ground? If this is indeed the case, it is small wonder that no loom or identifiable object from a loom of this kind has ever come to light. This would explain the negative research results, coupled with the possibility that in ancient Peru the heddle of the Paracas blankets may not have had a heddle rod.

In conclusion, I would like to make one or two considered remarks concerning the research in Denmark during the 1930s and 1940s into archaeological textiles from the Danish Bronze and Iron Ages (15).

These textiles are very dark and at the same time often matted. They were studied by spreading them out on a glass-topped table and by lighting them from above and below. The course of each thread was followed over the greatest possible area, both the warp and the weft, and at the same time marked off with a thin thread on a fine needle. The draft of the individual weft or warp thread was then drawn. Are the Paracas textiles too large for this method of examination?

In spite of all the kind help and attention I received in 1966 from the officials of the Magdalena Museum to whom I owe a deep debt of gratitude, I had to abandon the idea of undertaking a *full* examination of the two mummy blankets under discussion. I hope, therefore, that future textile researchers will return to the analyses of these textiles, and perhaps by transillumination *zone by zone,* as well as screening with powerful lenses, they may detect more unusual details than those observed by me.

(15) H. C. Broholm & Margrethe Hald: "*Costumes of the Bronze Age in Denmark*", 1940, Copenhagen.

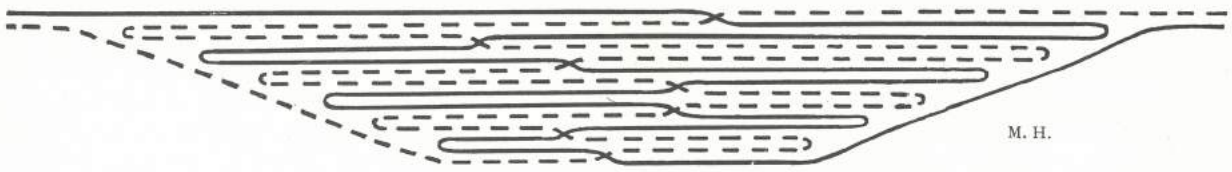

Fig. 18. Analysis of a special zone in a man's mantle from the Early Bronze Age in Denmark. (After Broholm and Hald).