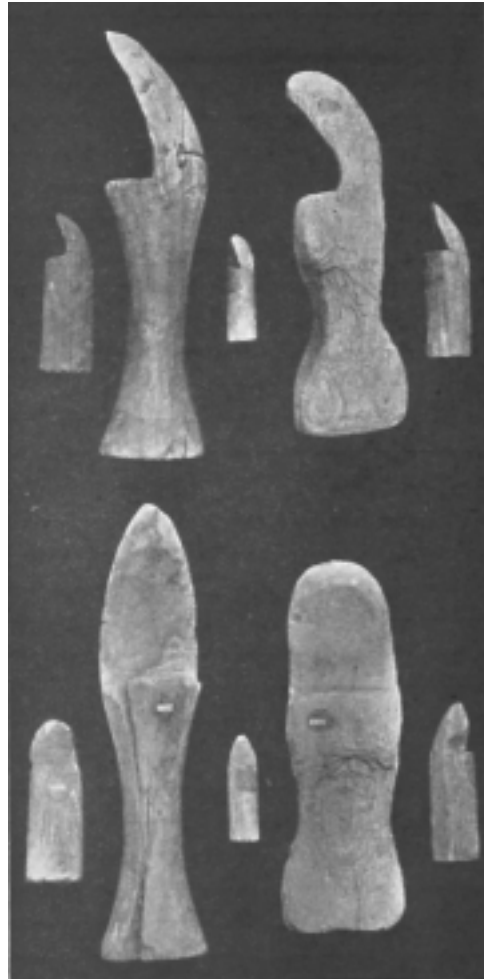


HEDDLE-JACKS OF MIDDLE KINGDOM LOOMS.

IN ANCIENT EGYPT, 1921, page 97, there is an article by H. Ling Roth and G. M. Crowfoot on the model of spinners and weavers found by the Metropolitan Museum Egyptian Expedition in the tomb of Mehenkwtre' at Thebes. Toward the end of her remarks Mrs. Crowfoot notes that in the model "one very essential part of the Sudani loom is missing, the heddle-rod supports," and then makes the suggestion that "the curious wooden implements lying on either side of the (model) loom were used for this purpose," only to discard the idea because these objects seem to her "much more like tools used in the hand to adjust something." As no explanation along this line occurs to her, she finally republishes "a drawing of originals of similar implements from the University College collection in the hope of finding a solution."

It chanced that independently of Mrs. Crowfoot I had arrived at the very solution which she discards, and believe that I have found ample confirmation of its correctness on the monuments and in the originals at University College (Fig. 1), and in still another original in the Cairo Museum shown to me by Mr. Quibell. Since the subject has been opened it seems worth while to clear up this one point in anticipation of any fuller discussion of these model looms.

The originals are wooden cylinders about a foot high, with a rounded, spoon-like, head above a notch in one side. In the model from the tomb of Mehenkwtre' (Fig. 2 and the photographs in ANCIENT EGYPT, 1921, frontispiece and p. 99); in another model in Cairo found by Quibell at Sakkara, and in the paintings from the tombs of Bakt and Khety at Beni Hasan (Fig. 2), these objects are to be seen lying on the floor on either side of the loom not far from the ends of the heddle-rod. In all these cases the heddle-rod is lowered to form the counter-shed, but to form the shed (for the return of the shuttle through the warp) some appliance must be provided for raising the heddle-rod and the alternate warp threads leashed to it. In the fixed-heddle loom, which is still used across North



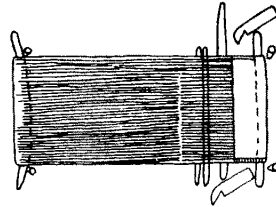
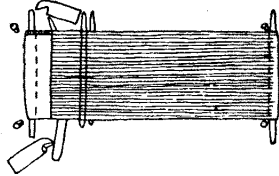
Africa, up the Nile Basin and out to Madagascar, the heddle-rod is either suspended

from an overhead frame, or is jacked up on supports such as those described by Mrs. Crowfoot from the Sudan, stones, baked clay pillars, Y-shaped sticks, or even a couple of pots. (See H. Ling Roth, *Royal Anthropological Society Journal*, 1917, Figs. 80 and 89A, and *Ancient Egyptian and Greek Looms*, Bankfield Museum Notes, 1913, Fig. 12). Since there was no overhead frame from which to suspend the heddle of the Middle Kingdom horizontal looms, some similar jacking support for the heddle-rod was absolutely necessary, and being an indispensable part of the contrivance, it must be shown in the models and the wall paintings. The short wooden cylinders lying at either end of the heddle-rods are the only objects invariably shown in the representations of these looms which could be put to this use, and I therefore feel that there should be no hesitation in calling them the heddle-rod jacks.

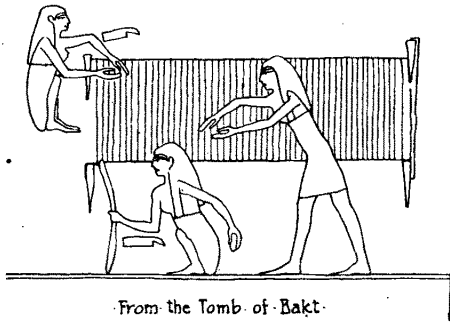
However, there is one essential difference between these jacks and the supports for the heddle-rods of the modern African looms already cited. The latter have heddle-rods permanently supported or fixed. Had the heddle-rods of the Middle Kingdom looms been fixed on the jacks, they would be so represented; but, as a matter of fact, in most cases the rods are drawn or modelled as slacked down with the jacks lying prone beside them. This must be taken as a characteristic position in weaving, and the conclusion drawn that the Middle Kingdom loom had a movable heddle, which was not continuously jacked up.

To put these theories to a test, there seemed to me to be no more practical method than to make a working model of a loom, about 1 foot long (Fig. 2). As shown in the sketch, it is a perfectly practical machine. With the jacks removed from under the heddle-rod—as in the Mehenkwetre' model and in the Bakt and Khety pictures—the counter-shed is formed, and the shuttle is passed from right to left. The heddle-rod is then raised by hand, first at one end and then at the other, and the jacks inserted. Evidently it is this operation of raising the heddle which is shown in the Khnum-hotep picture, and the sadly damaged Daga picture apparently shows the heddle supported on the jacks. The shed is now formed, and the shuttle given the return shot from left to right. The jacks are then knocked out, the counter-shed again formed, and the shuttle again shot, and so on.

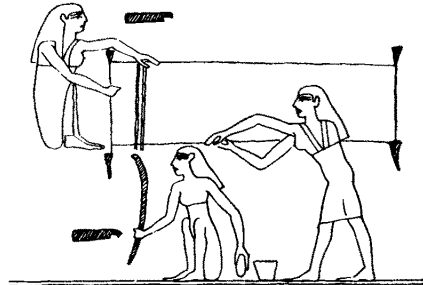
The heddle-jacks thus have to be set up and knocked down for every two shots of the shuttle—a process which seems extremely laborious on the face of it, but which life-long practice probably made a lighter task for a skilful pair of ancient weavers than we should find it. Moreover, the jacks themselves are contrived to simplify the process as much as possible. The spoon-shaped top is expressly contrived to slip under the end of the rod when it lies close to the floor; the rod end then slides into the notch; a quick jerk is given, and the jack sits upright, firmly held on its broad base by the tension of the warp threads. To lower the heddle-rod a smart blow on either jack brings down the whole affair. A pair of tall, slender jacks with narrow waists, in University College (Fig. 1) seems to be designed to be pulled or knocked out by hand; but the stouter ones in that collection, and the one in Cairo, show deep battering on the sides and marked rounding on the bottom, from long use in looms where the tension of the warp was so great that heavy blows were necessary to tip the jacks over on the earthen floors. This indeed seems to have been the usual thing, for in all three Beni Hasan pictures, and in the Mehenkwetre' model, the assistant weaver (the one who wields the beater-in) holds a stone in her hand to knock her jack down.



The Two Looms of the Mehenkwaire' Model.

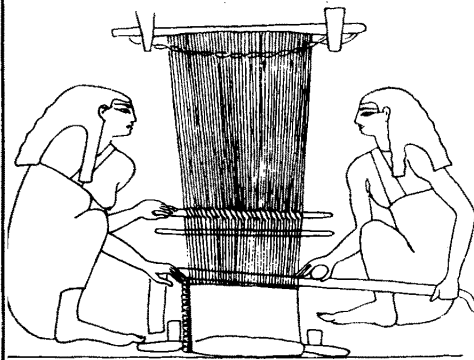


From the Tomb of Bakt.

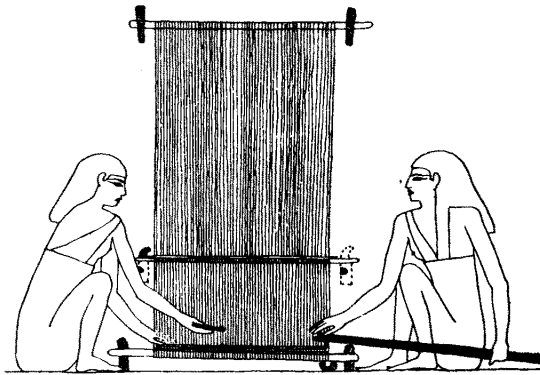


From the Tomb of Khety.

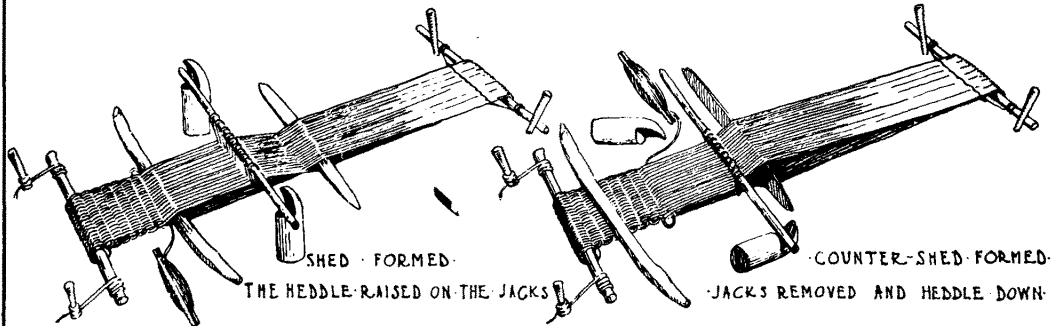
THE HEDDLE-JACKS DOWN DURING WEAVING.



From the Tomb of Khnum-hotep.
SETTING UP THE HEDDLE-JACKS.



From the Tomb of Daga.
THE HEDDLE RAISED ON THE JACKS.



SHED FORMED
THE HEDDLE RAISED ON THE JACKS

COUNTER-SHED FORMED
JACKS REMOVED AND HEDDLE DOWN

WORKING MODEL OF THE MIDDLE KINGDOM HORIZONTAL LOOM
IN ACTUAL USE.

FIG. 2. ANCIENT AND MODERN DRAWINGS OF LOOMS WITH HEDDLE-JACKS.

Whether or not there exists to-day a loom working on exactly this principle, I cannot say. However, the fixed-heddle loom of Libya and the Sudan—the zone of ancient Egypt's influence—appears to me to be the direct descendant of this Middle Kingdom loom. The jacks are now fixed, except when the fabric advances or is rolled up on the breast-beam, and the counter-shed is made by a complicated but rapid manipulation of shed-sticks, which is less laborious than handling the jacks. But the jacks remain, and the machine is that of the Middle Kingdom, except that it is operated in a slightly different way.

The available illustrations of Middle Kingdom looms are far from satisfactory. Only a very few tombs have preserved weaving scenes, and these are in bad preservation; and they have been copied with scanty knowledge of the working of looms, and have rarely been reproduced in facsimile. In default of really intelligible copies of the Khnum-hotep weavers, Ling Roth (*Ancient Egyptian and Greek Looms*) has reproduced for comparison the copies by Cailliaud, Wilkinson, Rosellini, Lepsius, Newberry and an original drawing by N. de G. Davies. I have attempted to make a freehand composite sketch interpreting Davies' most recent copy from the older ones by Cailliaud (*Recherches sur les Arts et Métiers*), Rosellini (*Mon. civ.*, pl. xli) and Champollion (*Mons.*, pl. ccclxxxii bis). The Daga weavers are published only by Davies (*Five Theban Tombs*, pl. xxxvii), and are here redrawn with restorations, none of which are important except the heddle-jacks, which I believe I can recognize in his copy. The weavers from the tomb of Baḳt are illustrated by Newberry (*Beni Hasan*, II, pl. iv) at a most inadequate scale—here enlarged freehand—while those from Khety are redrawn from Rosellini (pl. xli) and Champollion (pl. ccclxvi), with the jacks taken from Newberry (pl. xiii). Until fresh copies can be made from the monuments in the light of new technical knowledge, the student is warned to look upon these illustrations as makeshifts at the best. The diagrams of the Mehenkwetre' looms are from an illustration prepared by Mr. L. F. Hall for a future publication of the models by the Metropolitan Museum, and those of the working model are from a loom I have made and worked myself.

H. E. WINLOCK.