WEAVING.—No. III.

ANCIENT LOOMS.

WHEN it is considered how little is known of the early history of weaving, it may be easily understood how much less likely it would be for a description of its various processes to exist. The products of the loom, under certain advantageous circumstances, may be preserved for thousands of years, and still give proof of their peculiarities, either in excellence or defect of manufacture. Thus, the mummy cloths of Egypt supply abundance of proof, not only concerning the existence of weaving 4000 years ago, but of the general excellence of the products then produced. Numerous specimens of this cloth, still wrapped round the embalmed bodies, are to be seen in the various public museums, and nothing could give more conclusive evidence regarding the state of the art in those, the earliest periods of history.

Although woollen and cotton cloth have always been most commonly used for clothing and other purposes, it is fortunate that the Egyptians did not enshroud their dead with either of those materials, and particularly so with wool, which, owing to its property of breeding, or being liable to become infested with worms and insects, would be more likely to perish than linen cloth. Thus linen was purposely chosen for shrouds on account of its cleanliness and lasting qualities. The dead were encased in its folds, so that the bodies should be preserved uninjured, for a period of 3000 years, when it was believed that the former spirit would return, after its transition state and habitation of the bodies of various animals, to resume its previous existence.

It is to this circumstance that we owe what actual knowledge of ancient weaving we now possess. The Egyptians also used wool and cotton for weaving purposes, the poorer classes being clothed with

FIG. 2.

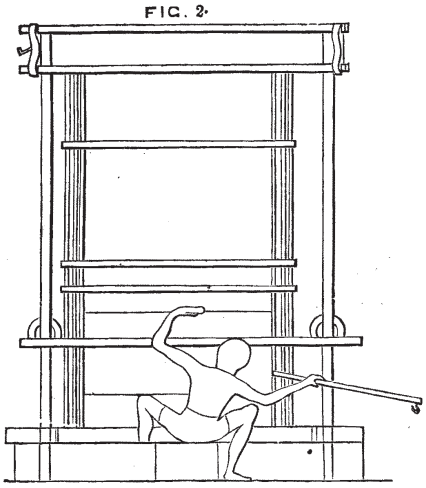


FIG. 1.

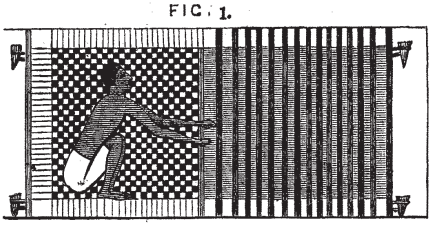


FIG. 5.

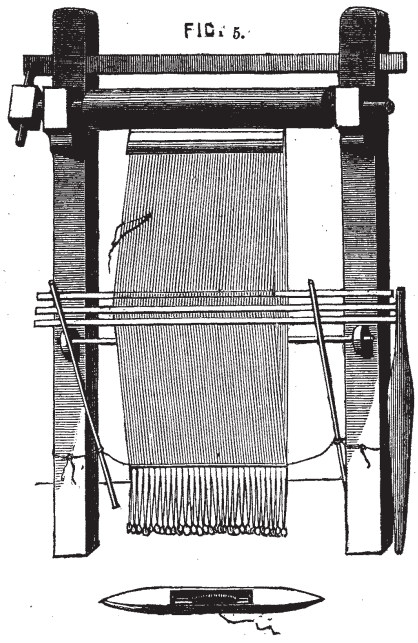


FIG. 6

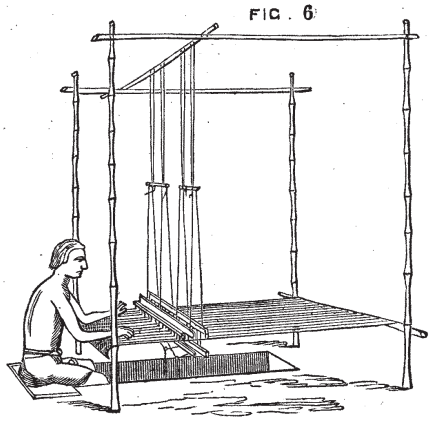


FIG. 3

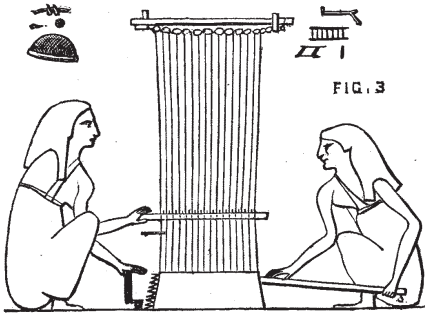


FIG. 4.

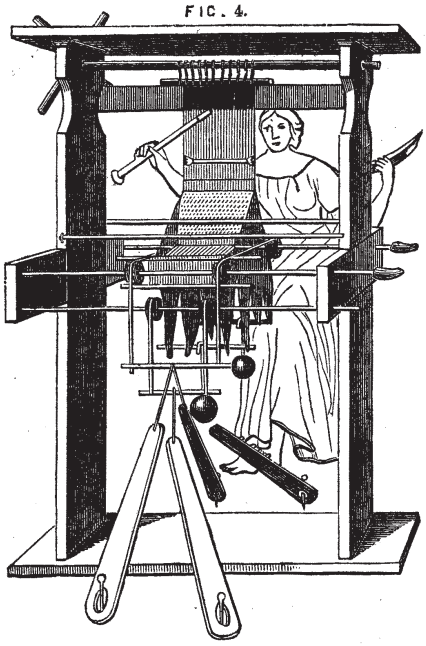
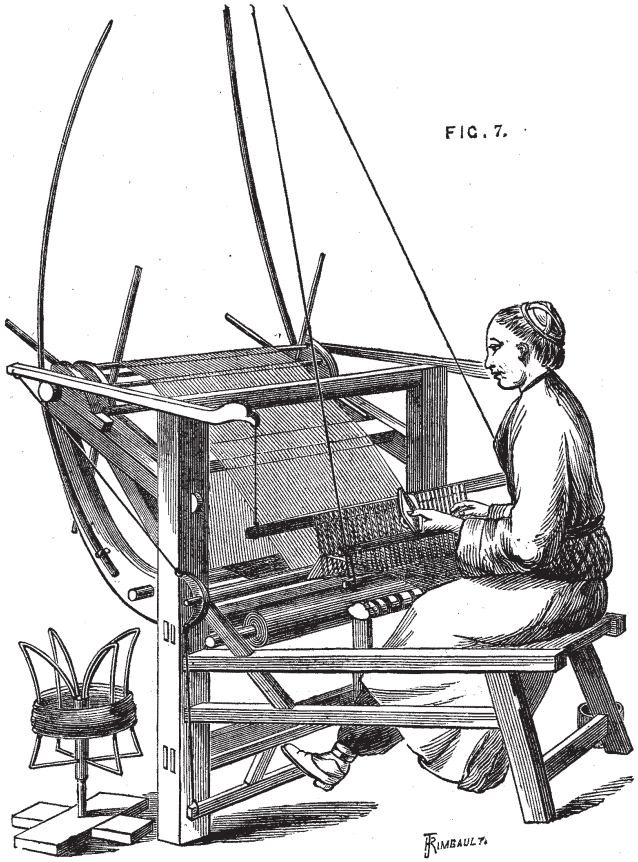


FIG. 7.



woollen cloth, and the rich with cotton and wool. The priests wore linen, in accordance with their idea of its purity, for they were not allowed to enter the temples with any article of dress composed of wool, that material being considered unclean, from the circumstances before mentioned.

But although it is possible to preserve cloth for long periods of time, when it has been prepared and deposited for that purpose, it is quite another matter as regards the loom in which it was woven. It is characteristic of many things in every-day life which have long been in use, that they rarely suggest to the mind that they may be supplanted by quite different methods, and for the old systems to become totally forgotten. How many of the ancient arts have been lost through the historian making no record of their processes? We therefore cease to wonder that no certain knowledge of the ancient loom exists. Fortunately, there are a few very ancient paintings on the walls at Thebes representing several processes of weaving and spinning, but the looms are not clear enough to understand.

An account of these paintings is given by Sir Gardiner Wilkinson in his "Manners and Customs of the Ancient Egyptians," to which work we are indebted. Thus Fig. 1, on the preceding page, represents a weaver at work upon a piece of cloth, woven in a horizontal position on the ground, and Figs. 2 and 3 represent vertical looms —for both vertical and horizontal looms were used by the Egyptians. In Fig. 2 the weaver is shown weaving cloth with a coloured border, and in Fig. 3 two females are shown at work at the loom. It required the services of two to weave with the vertical loom—one, perhaps, to open the shed and attend to the warp, and the other to work the shuttle and attend to the weft.

It will be noticed in both Figs. 2 and 3, that the weaver holds a stick, or lever, in the right hand; at the end of these levers there is a hook. Sir Gardiner tells us that he thinks these hooks were for the purpose of *drawing* the weft thread through the warp—in a similar manner, we may suppose, to willow or horse hair weaving, where short lengths only can be used. If such a system really was in use by the Egyptians, and the cloth which now exists was woven by drawing the thread through the warp shed, the cloth would give evidence of it, for it must necessitate the formation of an open selvage, or fringe, on at least one edge of the cloth, and, even if the thread was drawn through by the hook, in such a manner as to use long lengths of weft, it would then have a *double* weft thread, with a perfect selvage on one edge of the cloth, and an open one on the other—similar to the weaving by some of the modern shuttleless looms. But the Egyptian cloth that we have seen has no double threads, and both the selvages are perfect, showing that the shuttle was passed entirely through the shed, from side to side alternately, as in ordinary weaving. Therefore, what can these sticks, or levers with hooks, be for? They must either represent the shuttle itself, or the means wherewith it was thrown. Before the reed was invented the weft thread is said to have been combed evenly into its place by means of a comb adapted for the purpose, and the blow was given to drive them together by the use of a flat sword-shaped piece of wood, which was introduced into the shed for that purpose. This latter instrument was called the "spatha." The cloth was woven by forcing the weft *downwards*, and Sir Gardiner quotes Herodotus, who states that the Egyptians wove their cloth in that manner, whilst other nations wove it by pushing the weft *upwards*. In the latter way of weaving, it is easy to see how to slide the shuttle from side to side, for it could run upon the comb or reed—as in some modern vertical looms—but it is not so easy to conceive how to slide the shuttle when the cloth was woven downwards. The shuttle was probably thrown from hand to hand, without any shuttle race or reed for it to slide upon, otherwise it would be difficult to understand how the loom could be worked with the simple mechanical means they appear to have possessed.

In Dr. Smith's dictionary of "Greek and Roman Antiquities," under the article Tela (Greek loom), Mr. Yates, in describing the ancient Greek loom, compares it with the common loom used in Iceland, if not at the present, at all events in very recent times. Fig. 4 is a representation of this loom. The warp is suspended from the top beam of the loom, and the lower ends are tied up in separate portions, which are weighted to keep the threads in tension. The cloth was woven *upwards*. A comb was used, as already described, and the spatha also, which is shown in the drawing.

It may be here remarked that the use of the comb ought not, in all cases, to imply that a reed was not used. It is far from being uncommon for weavers of the present day to use a comb, especially when they have a sticky warp to weave, or a warp that, owing to the felting property of the material, such as wool, requires to be separated frequently. In cloth weaving there is a special contrivance for this purpose in order to prevent the shuttle being thrown out of its course by coming into contact with threads that have adhered more or less to the adjoining ones.

The reed itself is but a species of comb, and takes its name from the material of which it was formerly made, viz., slips of reed. It is not, therefore, unreasonable to infer that the reed was used in ancient times, as well as the comb, in the weaving of the finer descriptions of cloth; and in weaving rugs or matting, the spatha, and the hook before mentioned, would thus be satisfactorily explained.

Fig. 5 represents a loom which is asserted by Montfaucon to be copied from an ancient manuscript supposed to be of the fourth century, and entitled the "Virgil of the Vatican." It formerly belonged to the monastery of St. Denys, in France.

The loom used in India for the production of the most delicate muslins, cloths, shawls, and other fabrics is of an exceedingly rude nature, and it is highly probable that it is, in mode of construction, the most ancient loom known. Consequently a full description of it can scarcely be omitted here. Fig. 6 represents a common Indian loom as used in the celebrated manufactures of Dacca.

Dr. J. Forbes Watson, M.A., in his work on "The Textile Manufactures and the Customs of the People of India," enters very fully into their mode of spinning and weaving, and descriptions of their ornamental fabrics. In describing the looms which produce the famous muslins of Dacca he extracts from the work of Mr. Taylor, which was published for private circulation only. Mr. Taylor formerly resided at Dacca, and was intimately acquainted with the mode of spinning and weaving there. From these sources we learn that at Dacca the loom is *always* placed under a *shed* or *under cover*, or in the weaver's house, and not in the open air as usually represented. The warp is fixed to the cloth beam by a small slip of bamboo passed through the loops and fixed into the groove. The beam is wound up by a winch, and held by a stick passing through a mortice hole, and fixed to the ground.

The batten consists of two flat pieces of wood, into which grooves are cut for the reed or sley, which is fixed in by iron or wooden pins, and is suspended from the capes of the loom. The range of motion of the batten is adjusted by passing slings through several pieces of sawn shell. By lengthening or shortening the slings the extent of motion is adjusted, for upon this the regularity of the blow depends.

The balances of the treadles, having the slings fixed at their extremities, are suspended from the transverse rod above. The treadles are made from pieces of bamboo, and are contained in a pit dug in the ground about 3 ft. long, 2 ft. wide, and 18 in. deep.

The shuttle is made of *light* wood, of the betel-nut tree (Areca catechu), and has spear-shaped iron points. It is from 10 in. to 14 in. long, and ¾ in. wide, and weighs about 2 oz. It has a long open space for the wire, upon which the reed, on which the weft is wound, revolves. The weft passes through an eye at the side of the shuttle.

The temple (the instrument for stretching the cloth from selvage to selvage during the operation of weaving) is formed of two pieces of wood, connected together with cord, and having at their ends two brass hooks or pins, which are inserted in the edges of the cloth on the under surface.

The weaver sits with his right leg bent under him, upon a piece of board or mat, placed close to the edge of the pit, and depresses the treadles alternately with the great toe of the left foot. The stretch of the warp seldom exceeds one yard in length, and the depth of the shed is about seven-eighths of an inch.

To lessen friction, the shuttle, reed, and lay (shuttle race), are all oiled, and a brush smeared with mustard oil is occasionally drawn along the warp. The brush is made of a tuft of fibres of the nul plant (Arundo karka). When ten or twelve inches of cloth are woven it is sprinkled with lime water, to prevent its being injured by insects. The most favourable condition of the atmosphere for weaving is about 82 deg., combined with moisture, and to effect this in very dry weather, shallow vessels, containing water, are placed under the loom. A piece of Dacca muslin measures twenty yards in length by one yard in width. In the preparation of the warp it takes two men from ten to thirty days.

The weaving of such cloth takes two persons (one to weave and the other to prepare the weft and attend) from ten to fifteen days for the ordinary assortments. Twenty days for fine, and thirty days for superfine. The fine superfine takes from forty to forty-five days, and the dooreas or charkana assortments, sixty days.

A specimen of cloth called mulmul khas (muslin made for the king), and measuring ten yards by one yard, contained 1800 or 1900 threads in the warp. It weighed 3 oz. 2 dwt. 14 grains troy. It is so fine as to pass through the smallest ring. Price 100 rupees, or 10*l*. Another specimen, as worn by native dancers and singers, measuring twenty yards by one yard, had 1000 threads in the warp, and weighed 8½ oz.

The Indian method of weaving figured muslin may be taken as the general mode adopted for weaving the various beautiful fabrics for which they are so celebrated. Mr. Taylor describes the process as follows:—

"Two weavers sit at the loom. They place the pattern, drawn upon paper, below the warp, and range along the track of the woof a number of cut threads equal to the flowers, or parts of the design intended to be made, and then with two small, fine pointed bamboo sticks, they draw each of these threads between as many threads of the warp as may be equal to the width of the figure which is to be formed. When all the threads have been brought between the warp, they are drawn close by a stroke of the lay. The shuttle is then passed by one of the weavers through the shed, and the weft having been driven home it is returned by the other weaver. The weavers resume their work with the bamboo sticks, and repeat the operation with the lay and shuttle in the manner above described, observing each time to pass the flower threads between a greater or less number of the threads of the warp, in proportion to the size of the design to be formed."

It is thus seen that the ornamental fabrics of India are purely a handicraft work, and performed in the rude description of loom already described.

The Chinese loom shown at Fig. 7, presents such a contrast to the other primitive looms represented, that it cannot fail to be appreciated for its originality of form and the suggestiveness of its various parts. Compared with the modern hand loom it is singularly compact and adapted for household use. In ancient times weaving was practised in all the great houses, where a room was set apart for the purpose. Should small looms, for fancy or domestic use, ever be introduced in a similar manner to the sewing machine, some modification of the Chinese loom would, perhaps, alone commend itself to favour. The drawing is copied from a larger one in the "Trait de la fabrication des Tissus," by M. Falcot.