CHAPTER ONE

Weaving, Hand

One of the most ancient crafts, hand weaving is a method of forming a pliable plane of threads by interlacing them rectangularly. Invented in a preceramic age, it has remained essentially unchanged to this day. Even the final mechanization of the craft through introduction of power machinery has not changed the basic principle of weaving.

Other techniques had been devised to the same end: single element techniques—looping, netting, knitting, crocheting—and multiple element techniques—knotting, coiling, twining, braiding. In weaving, in the latter group, one system of threads, the warp, crosses another one, the weft, at right angles, and the manner of intersecting forms the different weaves.

Gradually the various phases of manipulating warp and weft were mechanized until the technique of weaving surpassed all others in efficiency.

Whereas single-thread methods can be handled with few tools, weaving needs more complicated equipment since the warp has to be given tension. The device giving such tension is the loom. Weaving, then, is the process of passing the weft between taut, alternately raised warps, as in the basic plain weave, or between other combinations of selected warps, and pressing it into place.

Earliest weaving was done on the warp-weight loom, where warps were suspended from an upper bar and weighted at bottom. Weaving here progressed downward, unlike other weaving. It was used in ancient Greece, and, more recently, by Indians of the North Pacific American coast. Next came the

two-bar loom, with warp stretched from bar to bar, or, for extended length, wound onto the bars. Used either vertically or horizontally, the warp was held taut by a framework or stakes in the ground. Early Egyptian records show weaving on such a loom which, in vertical position, is also the tapestry loom of today.

Another loom, allowing for subtly adjustable tension, therefore finer weaving, is the back-strap loom, in which the lower bar is attached to a belt around the waist of the weaver, who, leaning forward or backward can tighten or slacken the warp. This loom made possible the extraordinary textile achievements of pre-Columbian Peru and is still found in remote regions of Asia and parts of Central and South America.

The intersecting weft, crossing between raised and lowered warps, was first inserted without tool, the extra length being wound into little bundles, as today in tapestry weaving: i.e., pictorial weaving. Later the weft was wound onto sticks and released as it traversed the warp. Finally, to introduce the weft faster and in greater length, it was wound on bobbins, inserted into boatlike shuttles, and thrust across the opened warp (the shed) in hand as well as in power looms.

To beat the weft into place, a weaver's sword of wood was an early instrument. Later a comblike "reed" was introduced, combining warp spacing with pounding of the weft. Suspended from the loom framework, the reed swings against the woven fabric, pressing successive wefts against it.

A first device for speeding up the selection of warps between which the weft passes was the shed-rod, carrying raised warps. To raise the opposite warps, an ingenious device, called a heddle, was introduced. The warps running under the shed-rod were tied with string-loops to a second rod, the heddle-rod, and they now could be raised past those on the shed-rod with one upward motion. Later, series of heddle-rods, replacing the shed-rod, facilitated the production of weaves based on more complex warp operation than that demanded for the plain weave, based on the principle of opposites.

In the medieval loom, the heddle-rods, now called shafts or harnesses, were suspended from the framework, similar to the pounding device, and were attached to foot treadles, as they are on hand looms today. They are still found on power looms. Though of incalculable value in saving time, this invention limited the thus far unlimited, primitive warp selection.

To regain some of the early freedom, the highly developed draw-loom was devised. Chinese in origin, developed for elaborate pattern weaving, such

as brocades and damasks, it was later adopted in Europe. It was superseded by a further mechanized warp-selection method, Jacquard weaving, still in use today, though transferred during the past century to power-driven machinery.

Among high achievements in hand weaving, Coptic as well as early Peruvian weaving must be recognized, the latter surpassing perhaps in inventiveness of weave structure, formal treatment, and use of color, other great textile periods. In fact, practically all known methods of weaving had been employed in ancient Peru, and also some types now discontinued.

Today, hand weaving is practiced mainly on the medieval shaft loom with few harnesses. No longer of consequence as a manufacturing method in an industrial age, it concerns itself chiefly with fabrics for decorative use. Increasingly, though, industry is turning to hand weavers for new design ideas, worked out on hand looms, to be taken over for machine production. Hand weaving is included in the curriculum of many art schools and art departments of colleges and universities, as an art discipline able to convey understanding of the interaction between medium and process that results in form. It has survived through the ages as an art form in tapestry.

Hand weaving has also been taken up in the field of occupational therapy, having, though, as its aim there neither an educational nor an artistic end but solely that of rehabilitation.

It should be realized that the development of weaving is dependent also upon the development of textile fibers, spinning and dyeing, each a part of the interplay resulting in a fabric. Recent advances in the production of synthetic fibers and new textile finishes are having profound effects upon the weaving of cloth.