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USA

Reversible Double-Weave on the Warp-Weighted Loom: the Northern Gudbrandsdal Tradition

The survival of the warp-weighted loom in two Norwegian communities has been well documented, beginning with Marta Hoffmann's *The Warp-Weighted Loom* in 1964. Less well known is another relatively recent Norwegian textile tradition for which the warp-weighted loom was also probably used, the 17th-18th century reversible double-weave coverlets of northern Gudbrandsdal. Although no contemporary documentation of this tradition survives, a large body of textiles provides fertile ground for deciphering how the warp-weighted loom may have functioned to weave this technique.

Approximately 40 textiles in Norwegian museums provide the basis for this program of close observation followed by experimentation. Observations revealed several key findings. First, reversible double-weave textiles exhibit strong variation in warp-thread spacing, a characteristic of looms without a reed, thereby offering strong support for the contention that these textiles were woven on the warp-weighted loom. Second, most reversible double-weave textiles show a certain amount of draw-in, but many are also somewhat wider at the beginning and end than in the middle. This suggests that a loom effect may have caused the developing web to expand as weaving approached its conclusion. Third, exposed warps from both light and dark layers in several textiles indicate that the fiber content is not the same: dark yarns appear hairy and have lost much of their twist; light yarns do not appear hairy and have retained their twist. Fourth, weaving mistakes indicate the probable direction of weaving in many textiles, allowing the development of a theory of common weaving practice for this body of textiles (orientation of the two layers in the loom and order of weaving light and dark) that contrasts markedly with less uniform weaving practices evident in surviving medieval Scandinavian double-weave textiles. Finally, recurrent weaving mistakes also suggest the possibility of pattern storing.

Experimentation using four shafts and a varying number of weight systems has led to several conclusions. First, pattern storing is both practical and effective on the warp-weighted loom, especially in comparison to the horizontal treadle loom. The large geometric patterns favored in this double-weave tradition lend themselves to such storing, and this technical/design aspect may have contributed to a preference for the warp-weighted loom over the emerging (in Norway) horizontal treadle loom. Second, achieving adequate tension to allow operation of two warp systems is a significant challenge. Increasing the weight load sufficiently may surpass a practical limit for the loom and/or the weaver, but observations from the textiles provide useful insight for further experimentation. Fabric expansion at the end of most textiles may indicate that weight rows were wider than the finished fabric, a circumstance that allows easier passage of the heddle systems. Additionally, the use of guard-hair fibers for one layer of warp threads may be the factor that allowed weavers of this tradition to

depart from the medieval norm of wool and linen. Guardhair and linen are both smooth fibers that may be essential for accommodating an opposing wool layer when executing double-weave on a weight-tensioned system.

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