ROSES AND SNOWBALLS:
THE DEVELOPMENT OF BLOCK PATTERNS
IN THE GERMAN LINEN-WEAVING
TRADITION

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Scholars are beginning to recognize that a large share of the most popular American block-pattern coverlet designs were derived from seventeenth and eighteenth century German linen patterns. This historical relationship between German linens and American coverlets is easy to understand if we consider both the importance of the linen industry within eighteenth century Germany and the large number of German weavers who immigrated into North America. Figures from south Germany in 1702, for example, indicate that one-fifth of all master craftsmen at that time were linen weavers [1]. Twenty percent of all American coverlet weavers known to John Heisey when he compiled his Checklist of American Coverlet Weavers were born in Germany, and an additional forty-eight percent were born in Pennsylvania, a state with a large German community [2].

Many of the patterns that German weavers introduced into North America were originally intended for weaving linen damask. The word damask may bring to mind the image of a highly-figured linen cloth woven with flowers, mottoes and coats of arms. Figured damask, however, was not the kind of damask that influenced American block-pattern coverlets. German weavers distinguished between two types of damask--figured damask, which they called Gebilddamast, and block-patterned damask, which they called Schachwitz or Bauerin Damast (country damask) [3]. Gebilddamast was woven on a draw-loom, and Schachwitz was woven on a shaft-loom. In the early eighteenth century, weavers of Schachwitz created an entirely new style of linen cloth that owed its visual appeal to the weaver's ability to make abstract designs composed of squares and rectangles.
Several German pattern books that included instructions for weaving block-pattern damask were published between 1677 and 1771. The earliest published German weaving book, Marx Ziegler's *Weber Kunst und Bild Buch* of 1677, though devoted to twills, already presented a few block patterns. The first extensive discussion of block patterns was contained in a series of volumes published by Nathaniel Lumscher between 1708 and 1736. This series began in 1708 with Lumscher's greatly revised edition of Marx Ziegler's *Weber Kunst und Bild Buch*, which Lumscher titled *Neu Eingerichtetes Weber Kunst und Bild Buch*, and was continued in three sequels whose titles can be abbreviated as *Anderer Theil* (Second Part), *Dritter Theil* (Third Part), and *Vierter Theil* (Fourth Part). These three sequels were published in 1725, 1727, and 1736 respectively. Lumscher's last three volumes contained many well-developed patterns that illustrated several specialized block-pattern drafting techniques. Roughly contemporary with the Lumscher sequels, and containing many of the same patterns, was *Zierlich-webende Minerva*, published by Johann Christoph Weigel. Nearly all of Lumscher's designs, as well as those in the *Minerva*, used a simple tie-up in which only one block at a time wove pattern. The first book to contain a large selection of designs requiring two or more blocks to weave pattern at the same time was *Nützliches Weber-Bild-Buch*, published by Johann Michael Frickinger, the court weaver in Onolzbach (now the city of Ansbach) in 1740. The last of the eighteenth century weavers' pattern books was Johann Michael Kirschbaum's *Neues Bild-und Muster-Buch* of 1771.

Block-pattern damask was called country damask and was woven on shaft-loom rather than on draw-loom, but it was far from simple. Statements in the introductions of the published weaving books make it clear that the intended audience was master weavers and their journeymen and not the nonprofessional weaver. Marx Ziegler, for example, commented: "This book is not for everyone, but for those who already have a little knowledge." Ziegler's tie-ups and drafts, for damask, double cloth, and complex twills requiring as many as thirty-two shafts, leave little doubt about what he expected of the reader in terms of equipment and knowledge. Frickinger's
combined-block patterns were even more complex and used as many as eight blocks—requiring forty shafts when woven in damask.

The Block-Pattern Concept

Central to the concept of a block pattern is the idea of a unit of fabric structure consisting of a self-contained square of interlaced threads. Because the face of such a unit usually looks different from the back, block-pattern designs can be made by arranging units next to one another so that some are woven face-up to form the pattern and the rest are woven face-down to form the background. In block-pattern designing, the self-contained units are treated without reference to their internal thread-by-thread structure, and once a design has been developed, it can be woven in a variety of different structures. All units that are controlled by the same set of shafts act together, and are said by modern weavers to be on the same block. In most modern weaving books, blocks (or sets of shafts) are identified by capital letters, A, B, C,... and the units controlled by these blocks are designated A units, B units, C units,... respectively. Two or more sets of shafts are always necessary to weave a pattern, and a block pattern requiring $n$ different sets of shafts is called an $n$-block pattern.

Eighteenth-century German weavers used the word "Theil" (part or piece) in much the same way that English-speaking weavers now use the word block, and early German weaving books thus referred, for example, to a three-block pattern as a "3-theilig Zug" [4]. The block-pattern concept was also implied in old German profile draft notation, where spaces between staff lines represented blocks and each vertical stroke within a space indicated a unit controlled by that block. In old German profile notation, as in modern profile notation, individual threads were not specified. Schachwitz exemplified the block-pattern concept. In block-pattern damask, the units of fabric structure were weft-faced satin pattern squares set against warp-faced satin ground. The unit square of damask required five warp ends to be entered sequentially into the loom on a set of five shafts, and these five shafts were operated by a tie-up using five

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treadles (Figure 1). A three-block pattern woven in damask therefore required a minimum of fifteen shafts, but the weaver of Schachwitz did not have to concern himself with these shafts individually when designing his patterns.

The concept of a block pattern seems to have crystallized between the last quarter of the seventeenth century and first decade of the eighteenth century. Evidence for this chronology lies in the contrast between the two earliest published pattern books, Marx Ziegler's *Weber Kunst und Bild Buch* and Nathaniel Lumscher's *Neu Eingerichtetes Weber Kunst und Bild Buch*. Although the *Neu Eingerichtetes* was a revision of Ziegler's volume with virtually the same text, the two books differed markedly in their selection of patterns and manner of presentation. Both books were largely devoted to twills, but the *Neu Eingerichtetes* contained nearly fifty block patterns and included a few draw-downs whereas the *Weber Kunst und Bild Buch* had only fifteen block-pattern drafts and no draw-downs. The *Neu Eingerichtetes* used profile notation (Figure 15) for block pattern drafts, and the layout of Lumscher's book implied that German weavers of 1708 knew how to interpret these profile drafts in the desired fabric structure. Ziegler's 1677 text, however, did not use true profile notation and this suggests that Ziegler had not yet realized that he did not always need to think in thread-by-thread terms.

Ziegler described himself as a weaver of Kölsch, which he defined as a blue and white linen twill woven on from eight to thirty-two shafts, and to some extent he seems to have been thinking of block patterns in twill terms. Instead of a specialized notation for block-pattern drafts, Ziegler used nearly the same notation for block-pattern drafts as for twill drafts; that is, an abbreviated form of thread-by-thread notation. As in the case of true profile notation, Ziegler's notation consisted of staff lines and spaces. However, Ziegler did not use discrete vertical strokes within spaces to represent blocks. Instead, he drew continuous lines across the entire staff to represent the actual threading. Ziegler's spaces could represent a variable number of shafts, but the shafts were always in straight numerical order (Figure 4). His approach to block patterns, from the perspective of a twill
weaver, and his thread-by-thread notation, led him astray in one important aspect of block patterns. Ziegler seemed not to realize that the fabric structure was entirely contained within the unit square and could remain unchanged regardless of the role or position of a given unit within a particular pattern. A standard twill design technique was to write a draft and then to copy it next to itself in inverted form. Ziegler also used this technique in several block-pattern drafts, but because he inverted his thread-by-thread notation as though the draft were a twill, he inadvertently reversed the threading within the units in the second half of his draft. Although natural and necessary in twills, this reversal created a defect in block patterns. A draw-down (Figure 5) of one of Ziegler's drafts interpreted as block twill (Gesteinte Zwilch) illustrates this defect. In this draft, the threading inversion reversed the twill lines in the second half of the draw-down and caused an awkward float between the two halves of the pattern. It may be noted that overshot and some other block weaves do require reversals in the threading of a unit, depending on where the particular unit falls within the draft, but this was not the case for any of the weaves in the German pattern books.

In spite of Ziegler's failure to recognize that fabric structure could remain invariant within the unit square, he clearly understood other aspects of block patterns. Ziegler's definition of Schachwitz or Bauerin Damast as a damask woven "with small and large squares set gracefully in different ways" could scarcely be improved upon as a description of a block-pattern fabric. Ziegler knew that block patterns could be woven in a variety of different fabric structures. Along with the drafts in his first block-pattern section, Ziegler gave tie-ups (Figure 4) for two rather dissimilar weave structures, Gesteinte Zwilch (block twill) and Doppel Kölisch (double cloth). Ziegler also provided damask and double-cloth tie-ups (Figure 7) for two more sets of block-pattern drafts and assumed that weavers would interpret his draft notation as appropriate: four shafts per space with alternating colors for double cloth, and five shafts per space for damask.
Designing With Blocks Used Singly:  
Marx Ziegler, Nathaniel Lumscher, and Minerva

Recognition that the unit of design could be a square of fabric rather than a single thread led German weavers to think about patterns in new ways. Before the early eighteenth century, almost all linen patterns were twills. Even the elaborate Gebilddamast woven on draw-looms was in a sense a gigantic point-twille of the type that German weaves called Hin und Wieder Arbeit [5]. The seventeenth and eighteenth century Gebilddamast weaver viewed damask structure as a binding and not as an aggregate of units, and the design of the Gebilddamast was developed point-by-point (thread-by-thread) in the tie-up (Figure 2). The designer of block-pattern damask was able to make use of some of the insights gained in the designing of twills, but he also required techniques unique to block patterns. In terms of the level of abstraction required for their creation, block patterns were at nearly the opposite end of the spectrum from draw-loom patterns. Because the weaver of Gebilddamast could control a large number of threads individually, he could attempt to approximate a picture on the draw-loom; his only constraint was the need to ensure a stable fabric structure. The weaver of Schachwitz, by contrast, did not need to concern himself unduly with the structure of this fabric, but he was constrained by the limited number of blocks at his disposal—perhaps eight at most. This number was limited since each different block required its own set of shafts and treadles. As a result, the block-pattern weaver could not hope to approximate a picture, no matter how crude, but had instead to create visually satisfying patterns from squares and rectangles.

The published pattern books show that, in the century between 1677 and 1771, German linen weavers developed a wide variety of block patterns. Chronologically and stylistically, the evolution of these patterns falls into two stages. The patterns presented by Marx Ziegler, Nathaniel Lumscher, and the anonymous author of Minerva were in many ways related to one another, but differed greatly from the patterns given by Johann Michael Frickinger and by Johann Michael Kirschbaum. All of the books contained some patterns that modern weavers will recognize, but the context within which these
patterns originated is not well understood. Mary Atwater and Marguerite Porter Davidson, who helped revive American interest in block-pattern designs in the early twentieth century, discovered that coverlet patterns had been given charming folk-art names like "Lovers Knot", "Cat Tracks and Snails Trails", and "Whig Rose"; and hence they assumed that the patterns were folk art. The earliest published drafts for the three above patterns (Figures 16-17 and 23-24) are to be found either in Lumscher's *Neu Eingerichtetetes* and its sequels or in the *Minerva*; other patterns known to modern weavers can be found in one or another of the German books. The published pattern books numbered rather than named their patterns, but the books sometimes used descriptive terms for the most common block-pattern motifs (Figure 3) that also might suggest folk art. It is likely that some of the German terms were even carried over to America and influenced the nomenclature of American weavers. In presenting the result of one of his twill tie-ups, Ziegler wrote, "This [tie-up] gives a star [Stern] and an eye [Auge]." Ziegler's star was an eight-pointed figure like that which North American weavers also called a star, and the "eye" was a diamond motif like the American weavers' "goose eye" or "bird's eye". At the end of the eighteenth century, Kirschbaum referred to a pine tree motif as a "Baum", the German word for tree. Two German terms for block-pattern motifs that appear in German weaving manuscripts, "rose" (rose) and "schneeball" (snowball), did not appear in the published books even though the motifs themselves did [6]. In spite of occasional folkish terms, however, the development of block-pattern designs in eighteenth century Germany was not an aspect of folk art. Block-pattern motifs and designs were the outcome of linen weavers' increasingly sophisticated knowledge of techniques appropriate for designing with blocks. Unlike the majority of twill weaves, in which so much of the design was in the tie-up that often the final pattern could be visualized by looking at the tie-up, techniques that involved the profile draft and treadling played the major role in designing block patterns.

The pre-Frickinger weaving books were largely restricted to block patterns that required from two to four blocks, although a few five-block patterns were presented and Lumscher's *Dritter Theil*
contained some patterns that seem to have been disarranged in publication but may have been intended for more than five blocks. Even within the limited scope of two-block drafts, however, it was possible to develop some striking patterns. Although Marx Ziegler may not have realized that it was possible to ignore thread-by-thread considerations in creating block-pattern designs, his *Weber Kunst und Bild Buch* already showed that the block-pattern weaver could achieve some effects not easily duplicated in twills. In Schachwitz, pattern squares could be as large as desired, because the structure was contained within the unit, and units could be placed next to one another without compromising the fabric. If he wanted, the block-pattern weaver could even weave a solid pattern square as wide as the cloth, a feat impossible in twill weaving. One way to create a variety of visual effects with block patterns was to adjust and arrange units on different blocks so as to make pattern squares of varying sizes, and one weaver or designer can often be distinguished from another by his sense of proportion. Ziegler took advantage of the different appearance given by pattern squares of different sizes and relative proportions. In the *Weber Kunst und Bild Buch*, Ziegler's first block-pattern draft (Figure 4) gave the most basic block-pattern design, the checkerboard, in which all of the pattern squares were the same size. In his next draft, the pattern squares were of different sizes, and the resulting contrast yielded a richer and more interesting design. Figure 6 shows draw-downs of Ziegler's first two drafts for block patterns.

Beginning with Marx Ziegler's simple three and four block patterns in 1677, German weavers began to develop a set of direct manipulations for expanding and enhancing drafts. The earliest method of expanding a draft was an inversion technique borrowed from a type of twill weaving that the German weavers called Gebrochene Arbeit. In contrast to Hin und Wieder Arbeit, Gebrochene Arbeit had complex drafts that sometimes resembled the letter M. In order to make a larger and more interesting pattern, the Gebrochene-Arbeit weaver took his letter M draft, inverted it, and copied it next to itself to make a final two-part draft that looked like MW. Quite naturally, a twill weaver like Marx Ziegler adapted this inversion technique to block-pattern drafts. Using this inversion on a block-pattern draft...
yielded a design in which two motifs alternated checkerboard fashion. Most drafts developed in this way were treadled as-drawn-in, and the alternation of motifs resulted from the fact that each half of the draft acted as a treadling variation on the opposite half while each half acted on itself as though treadled tromp-as-writ.

When block-pattern drafts were expanded by means of the inversion technique, the effects varied according to the construction of the original draft. In a pattern using only two blocks, the results of the inversion were simple and predictable: in the draw-down the second half was the negative image of the first half--dark pattern squares produced by the first half of the draft corresponded to light background squares produced by the second half. In drafts with more than two blocks, the results of the inversion were not so straightforward, and designers had to consider how individual motifs would be affected. Ziegler and Lumscher developed many of their motifs, usually simple stars or grid-works, on pairs of blocks; with more than two blocks, the pairs used for motifs had to be carefully chosen to insure the desired result. A three-block draft illustrates what was involved. If a star built of units arranged on the A and B pair of blocks was inverted to create the second half of the draft, the configuration of units on the A block was copied to the C block, while the units on the B block were simply duplicated. When the expanded three-block draft was treadled as-drawn-in, the draw-down showed large areas of white background alternating with the original star instead of areas that were the negative image of the original star. Such large areas of background were not generally wanted, but Lumscher used the effect intentionally on occasion to give a lighter, more open pattern (Figure 14). In order to get the positive versus negative effect in a three-block draft, stars or grids had to be built on the A and C pair of blocks. Ziegler applied the inversion and expansion technique to a three-block draft (Figure 7) that contained a grid motif with light bars across dark squares arranged on the A and C blocks. The units on the B block, which remained invariant under the inversion, were left as dividers between motifs. When Ziegler's draft was treadled as-drawn-in, the resulting pattern (Figure 8) showed two grid motifs that alternated in checkerboard fashion--one
with light bars on a dark ground and one with dark bars on a light ground.

The inversion technique could be used with drafts having more than three blocks, but none of the weaving books fully exploited the potential of inverting drafts having more than four blocks. With four-block patterns, two pairs were available to make positive-negative motifs using the inversion technique. In the *Neu Eingerich-tetes*, Lumscher gave a lone four-block draft (Figure 15) that employed the inversion technique. In this four-block draft an ordinary star was worked out with units arranged on the A and D blocks while the remaining two blocks, B and C, were left to act as borders and spacers. Figure 18 shows the draw-down that resulted. The B and C pair could have been used to make another motif, but neither the *Neu Eingerichtetes* nor any of the other books showed a four-block draft that used both pairs (AD and BC) to make motifs with the inversion [7]. Although five-block patterns had two pairs (A,E and B,D) plus an invariant (C), published pattern books did not set up five-block drafts to give a positive-negative effect with inversion. Ziegler's only five-block draft (Figure 9) used the inversion; but since the units were set up much like a twill draft, the result of inversion was a draw-down that had a "twillish" look. In the tromp-as-writ parts of the draw-down, the pattern squares formed an X-shape much like that which twills gave when treadled as-drawn-in; where the inversion created a treadling variation, the pattern squares formed a diamond shape similar to the diamond created by an inversion in twill weaving.

The *Neu Eingerichtetes* contained many of the same techniques for developing block-pattern drafts that were shown in the *Weber Kunst und Bild Buch*, but, nonetheless, the patterns in the *Neu Eingerich-tetes* showed that weavers had become increasingly adept at using those techniques during the thirty years that had elapsed between the publication of the two books. Many of the drafts in the *Neu Eingerichtetes* were long and complex; and, in addition, the enlarged section of three-block drafts (Figures 10-14) was laid out so that an attentive weave who worked through the drafts in order could learn much about how block-pattern designs were developed. Along with
the well-laid-out set of longer and more highly elaborated drafts for ordinary block patterns, the *Neu Eingerichtetes* contained an interesting hybrid weave called Gesteinte und Gebrochene (literally block and broken). This weave (Figure 20) combined two blocks of damask with a third block composed of massed point-twill sequences. Although composed of two different weave structures, the resultant fabric was treated as a three-block pattern, and the units of the twill block were symmetrically arranged to enhance the overall appearance of the design. This combination of two dissimilar weave structures into a coherent block pattern clearly shows the German weavers' growing mastery of both block-pattern design techniques and the block-pattern concept. All of the weaving books which followed the *Neu Eingerichtetes* contained a few Gesteinte-und-Gebrochene patterns.

Lumscher's three sequels (*Anderer Theil, Dritter Theil, and Vierter Theil*) to the *Neu Eingerichtetes* contained patterns using techniques much more advanced than any in the *Neu Eingerichtetes*. However, to refer to the drafts and draw-downs in either the *Neu Eingerichtetes* or its sequels as "Lumscher's patterns" is somewhat of a misnomer. Lumscher was not himself a weaver but a bookbinder in Culmbach, and both the *Neu Eingerichtetes* and its sequels were only collections of information: dye recipes and guild regulations, as well as drafts and draw-downs [8]. Lumscher's patterns, therefore, may be considered representative of techniques available to linen weavers between 1708 and 1736 and indicative of fashions influencing the German linen industry during those years. The *Minerva*, which was published shortly before 1724, also appears to have been a collection of patterns rather than the work of a single designer [9]. Both Lumscher's sequels and the *Minerva* testify to the increasing popularity of Schachwitz during the first half of the eighteenth century and to the fact that by the 1720s linen weavers were no longer designing their block patterns primarily with techniques adapted from twills.

A new block-pattern technique that became important in *Minerva* and in the sequels to the *Neu Eingerichtetes* was the use of treadling variations as a means of developing block-pattern designs. Most
twills used in linen weaving had allowed little latitude for treadling variation, and though Ziegler, a twill weaver, had been aware that treadling variations were possible, apparently he had not been accustomed to using them. With respect to Gebrochene Arbeit, Ziegler wrote, "These patterns are to be treadled as-drawn-in or to please yourself." Even in his definition of Schachwitz, Ziegler stated that these patterns were "almost always treadled as-drawn-in." Significantly, neither Ziegler's Weber Kunst und Bild Buch nor the Neu Eingerichtetes had indicated treadlings. However, the Minerva contained several pages of detailed treadlings, and Lumscher's sequels provided both a draft and, where necessary, a treadling beside the draw-down for each pattern [10].

Among the most noteworthy treadling techniques that appeared in Lumscher's sequels and the Minerva were those that produced pine trees. To form the trunk of a pine tree, a single block was treadled many times in succession to create a long narrow rectangle of pattern, thus taking advantage of the fact that the structure of a block pattern was contained within the unit [11]. The Lumscher sequels and the Minerva, however, did more than merely extend the treadling of a single block. Usually, pine trees were developed from drafts that gave satisfactory patterns either when treadled as-drawn-in or with a block interchange (Figure 22). In these cases, the treadling for both the trunk and the crown of the tree had to be planned with regard to the original draft, and the treadling for each pine tree had to be individually specified. A few drafts (Figure 21) were also developed exclusively for pine trees and worked only with the designated pine-tree treadling. Eighteenth century German weaving books suggest that pine trees were commonly used throughout a woven piece, a practice that contrasts with the usage in American coverlets, where pine trees were generally restricted to borders. Few block-pattern linens survive in Germany to indicate the relative popularity of different designs, but several eighteenth or nineteenth century beiderwand pieces do have pine trees throughout [12].

As distinctive as the pine-tree treadling, and more versatile, was the treadling variation that modern weavers call rose-fashion. The rose-
fashion treadling, most often used with four-block patterns, consisted of a block interchange that reversed the roles of adjacent pairs of blocks so that all A units in the draft became B units in the treadling and vice-versa while at the same time the C and D units were substituted for each other [13]. The rose-fashion block interchange was specific to block patterns and did not work naturally with twills. One effect of rose-fashion treadling was to change a star motif into a rose motif. A rose-fashion treadling also converted the wheel pattern "Lovers knot" (Figure 23) into the "Whig Rose" pattern (Figure 24). Nearly all of the drafts in the Minerva were treadled rose-fashion, and the treadlings were explicitly written out. The rose-fashion block interchange was also used as a means of expanding a draft—in this case a draft was lengthened by adding a rose-fashion interchange of itself. Figure 25 shows a draft in which the rose-fashion interchange was used as a draft expansion; in the draw-down, a wheel and a Whig rose alternated checkerboard fashion. One of the most striking patterns in the Minerva and in the Lumscher sequels (Figure 26) cleverly exploited both a well-proportioned arrangement of pattern squares and the rose-fashion block interchange to give the illusion of swirling Baroque curves. The rose-fashion block interchange was also combined with other techniques. One draft (Figure 27) that appeared in Lumscher's Anderer Theil used both the rose-fashion block interchange and the inversion technique to produce open circles or wreaths ("Kransen"); and a draft (Figure 28) in both Minerva and Lumscher's Dritter Theil exploited the effect of the rose-fashion treadling on twill sequences to produce rings around all the inner roses of a Whig rose type design. The latter two books also included a ring pattern (Figure 29) that used a treadling composed of blocks in twill order and blocks arranged rose-fashion to give both waves and rings around small roses. It must be noted, however, that the introduction of the new pine-tree treadling and the rose-fashion block interchange did not supplant earlier design techniques. The Lumscher sequels, for example, contained, many beautiful patterns, such as the one in Figure 30, which used the inversion technique alone to expand an ingeniously-developed draft.
Designing With Combined Blocks:
J. M. Frickinger and J. M. Kirschbaum

Johann Michael Frickinger's *Nützilches Weber-Bild-Buch* marked a new stage in the development of German linen weaving. Frickinger was court weaver to the principality of Onolzbach, a position that probably had few, if any, parallels among German linen weavers [14]. As court weaver, Frickinger was exempt from local guild regulations, and his influence extended beyond the borders of his small principality. Frickinger said that he had seen the earlier pattern books for linen weavers, but he wrote that they contained little "from which masters and journeymen who do not possess the fundamentals can expect to have any marked benefit." Unlike the *Minerva* and the Lumscher series, the *Nützliches Weber-Bild-Buch* was more than just a collection of patterns. Frickinger directed his book to all weavers who wanted to learn the basis of their craft:

"One must take into consideration all sorts of readers--some who know something; some who know nothing at all of weaving or who have learned only to make tabby or twill. I admit that many have no need and no desire to go beyond tabby or twill, but there are also many who would gladly learn the basis [of pattern weaving] but lack the opportunity."

Frickinger's efforts to write a book on weaving that would present the fundamentals of the subject in a clear and simple manner were at least in part successful. The *Nützliches Weber-Bild-Buch* had the coherence of style that characterized the work of a single individual. One of Frickinger's innovations was to use the same number to designate the draft, the treadling, the tie-up and the draw-down that belonged to the same pattern, and he took pains to insure that readers would not read his tie-ups in the wrong direction. The fact that the *Nützliches Weber-Bild-Buch* was not simply a repository of patterns, but was a text from which weavers could learn to design patterns undoubtedly contributed to its success. The first edition of the *Nützliches Weber-Bild-Buch* was published in 1740, and its popularity was such that it was republished in three subsequent editions, the last in 1783. In terms of its place in the development of German
linen weaving, however, Frickinger's book was most important because it presented patterns of a type very different from those of earlier books.

One might expect that a court weaver would be weaving Gebild-damast in the fashionable rococo style, but Frickinger's book was devoted to "new Schachwitz patterns". The earlier patterns in the *Minerva* and in the Lumscher series had been developed by treadling blocks one at a time, but the new style required blocks to be treadled more than one at a time--or as modern weavers would say, used combined blocks. In the *Nützliches Weber-Bild-Buch*, patterns using combined blocks were described as "schwertheilig" (with heavy blocks) and patterns in which blocks were treadled singly were called "gleichtheilig" (with equal blocks). Johann Michael Kirschbaum used the term "leichttheilig" (with light blocks) rather than "gleichtheilig", and the most common distinction in manuscripts was between leichttheilig and schwertheilig patterns. In general, schwer-theilig patterns were bolder and more solid than leichttheilig patterns. The star and the rose were typical leichttheilig motifs, and the snowball was a typical schwertheilig figure. Frickinger wrote that he wished to fill the need for "new and schwertheilig patterns such as are liked now days", but he was not the inventor of the combined block. The first combined-block pattern to appear in published books was a simple stripe and pine tree in *Minerva* (Figure 31), and Lumscher's *Dritter Theil* contained a few combined-block patterns (Figure 32). However, neither *Minerva* nor the *Dritter Theil* contained clear instructions for weaving schwertheilig patterns [15].

The combined-block technique offered an entirely new range of motifs and solid bold effects, schwertheilig patterns also required new design ideas. In leichttheilig patterns, standard elements (roses, for example) stood out in the draft, but in schwertheilig patterns the relationship between pattern motifs and the draft was much more complex because of the combined-block tie-up. At every point the weaver had to be keenly aware of which blocks were acting together in the treadling. In addition, the elegant inversions and block inter-changes which worked so well with leichttheilig patterns could not be used with schwertheilig tie-ups. Instead of using simple block
interchanges and inversions, Frickinger developed modules by arranging units on certain sets of blocks and then requiring these sets to act together in the tie-up. As a result, tie-ups assumed a renewed importance in schwertheilig designs. Frickinger focused the attention of his readers on the tie-up when he used a transformation on a leichttheilig tie-up to replace the rose-fashion treadling. From this transformed tie-up he then developed one of his characteristic modules, the trellis. With the transformed tie-up, a rose became a trellis by combining a single pair of blocks (Figure 33). All modules had a component in the tie-up, and by arranging the tie-up properly Frickinger was able to control the behavior of his modules so that he could work freely with them. However, unlike a twill, the module could not be visualized in the tie-up since different modules could be made from the same tie-up; for example, the basic L-shape, the Greek cross, and the trellis could all use the same tie-up.

Once Frickinger had developed a module like the snowball, trellis, basic L-shape, or the short-armed Greek cross, he used the module to build up larger motifs. In a few cases, Frickinger even appears to have presented a series of modular designs to illustrate how a variety of patterns could be generated from the same basis. The L-shape appeared in many of Frickinger's designs. In one instance (Figure 34), he placed four L-shapes with their respective corners together to form a flower-cross, and later this flower-cross itself became a module for building yet more complex patterns. In another example (Figure 35), Frickinger arranged four L-shapes with their open ends together to make a hollow square. The Greek cross was one of Frickinger's most versatile modules. Greek crosses were set together in such a way as to retain their identities while creating a type of trellis (Figure 36), and they were massed together so as to lose their individual identities and to form a table (Figure 37). Frickinger presented a pattern (Figure 38) in which the Greek cross appeared in both the positive and negative, and in one of his most extraordinary patterns (Figure 39), Frickinger incorporated the Greek cross into a complex network of flowers and diamonds. The last pattern might appear to have been developed by means of the inversion technique, but it was not. Snowballs were also used as modules. Although Lumscher had given a simple snowball pattern in
In arranging his modules into patterns, Frickinger frequently applied what might be called the method of substitution. The idea of this method was to use the general layout of a leichttheilig design as a framework within which to substitute schwertheilig motifs. Thus, Frickinger took one of the familiar outcomes of the rose-fashion block interchange, the Whig rose pattern, and used its arrangement of rose motifs and borders as a framework within which to substitute several schwertheilig motifs. Although we may describe this replacement of leichttheilig motifs by schwertheilig ones as a kind of substitution, the substitution was not a simple replacement of one item for another in the draft; in drafting the pattern, the effect of the schwertheilig tie-up always had to be taken into account. The substitution of the snowball into the Whig rose format in Figure 40 might seem to have required six blocks, three for each snowball, but Frickinger overlapped the edges of the snowballs so that his actual draft used only five blocks. Setting up the borders around the central motifs of a Whig rose arrangement took planning, but Frickinger was notably successful in creating borders to set off his arrangement of motifs. Even though they gave a distinctively different appearance, many of Frickinger's schwertheilig adaptations of the Whig rose pattern actually took no more blocks that had the leichttheilig original [16].

Frickinger did not, however, restrict himself to designing with modules, but went beyond the modular technique to create patterns and motifs radically different from any in previous books. Three sets of designs—Frickinger's church spires, his snowflakes, and his Chinese lattice work—show his originality as a designer of schwertheilig patterns. By an ingenious variation on the pine tree treadling, he expanded ordinary stars and roses into elaborate Gothic and Baroque church spires (Figures 42 and 43). Frickinger's inspiration for the church spires may have come from the skyline of Onolzbach.
where the towers have remained much as they were depicted in an old print from 1690 (Figure 44). Among Frickinger's finest patterns were his intricate stars (Figures 45-47)—some of them so delicate and lacy that they might better be termed snowflakes. One of the most striking examples (Figure 45) was a star that used only three blocks—the same number required for a basic snowball. Using larger numbers of blocks, Frickinger interpreted a twill-type star as a block pattern and then arranged his units to give the same star in two different sizes. The tromp-as-writ treadling created distortions of the two differently sized stars so that they became both motifs and borders (Figure 46). Frickinger's most lavish star pattern (Figure 47) required eight blocks (40 shafts when woven in damask) and alternated two complex stars. Reflective perhaps of Frickinger's position as court weaver were patterns that showed the influence of the eighteenth century fashion for Chinoiserie. Several of these (Figures 48-50) bore a resemblance to certain Chinese lattice work designs. Although not Chinese, the basket-weave pattern was another latticework and was more difficult to draft than its simple appearance might indicate. In spite of this difficulty, Frickinger added both interest and further complexity to one such pattern (Figure 51) by placing his Greek cross in the spaces between the basket-weave elements [17]. Frickinger's patterns were very beautiful, but many were also complex, and he himself admitted that he had gone well beyond the fundamentals with his forty-shaft damasks:

"To work with 35 and 40 shafts will certainly render greater advantage even though this is the highest class of shaft-loom work. Under this classification you will find such that will require thought and will need great effort to weave, but you should not think that they have been set out only to look at or to vex people. They are meant to be woven and are serviceable.... Some people think that I drive the shaft loom weaving [foot-work] too high, but as in any art, I say, let him who will, drive it higher."

In spite of their advanced character, many of Frickinger's drafts and tie-ups were to find their way into later manuscript pattern books [18].
The last of the eighteenth century books devoted to Schachwitz was Johann Michael Kirschbaum's *Neues Bild-und Muster-Buch*, published in 1771. Until very recently, Kirschbaum was the only one among the seventeenth and eighteenth century German weaving-book authors to be known by name to modern American weavers. Kirschbaum's book in some sense represented a retreat from the most complex and elaborate designs presented by Frickinger, and it may also have been a conscious effort to revive earlier styles. Kirschbaum stated that Frickinger's eight-block or forty-shaft patterns were too difficult for most weavers, and he restricted himself to six-block or thirty-shaft patterns as his maximum. Kirschbaum also reprinted several leichttheilig patterns that had appeared previously in the Lumscher series; and he included at the back of this book some Gebrochene Arbeit, a type of twill that had not been published in the half century since the *Minerva*. Kirschbaum's schwertheilig patterns were generally flatter, heavier and simpler than Frickinger's--possibly reflecting the heavier, simpler style becoming evident in German neoclassical furniture. One of Kirschbaum's most interesting examples (Figure 52) was a Gesteinte-und-Gebrochene draft that used a combined-block lattice motif for the block-pattern portion of the design. In another pattern (Figure 53), Kirschbaum created an unusual cut-out effect by placing light motifs within dark squares. Kirschbaum's most complex design was the distinctive star and grill shown in Figure 54. This star motif without the grid appears in a number of surviving North American coverlets.

**Conclusion**

Because of the long time span over which they have been woven, block-pattern textiles have often been considered folk art. However, in the eighteenth century, block-pattern damask was woven from the finest linen by professional weavers using relatively complex looms, and it was a prized possession in wealthy homes. Some families are known to have had both a Gebilddamast woven with their coat of arms and a set of block-pattern table linens [19]. Testimony to the appreciation of block-pattern designs even among the nobility comes from the principality of Onolzbach, which in the mid-eighteenth
century was a flourishing center of German rococo art. In spite of the obvious visual contrast between rectangular block patterns and the rococo style, a weaver of block-pattern damask, Johann Michael Frickinger, was given the position of court weaver at Onolzbach. It might be noted that block-pattern designs were apparently not restricted to table linens at the court of Onolzbach. In the 1750s, the Margravine of Onolzbach, Frederike Caroline, chose to wear a gown with a block-pattern, stripe and pine tree design when sitting for a portrait by an Onolzbach court painter known for the care with which he depicted fabrics [20].

With the notable exception of Johann Michael Frickinger, the actual originators of most eighteenth century block-pattern designs remain unknown. The Minerva and the Lumscher series were collections which suggest that many individuals contributed to the block-pattern repertory. In spite of the inability to identify individual weavers, however, the published German pattern books show that block-pattern techniques evolved in a clear and logical manner in the period 1677-1771. The earliest block patterns did not use blocks in combination, and the earliest block-pattern design techniques borrowed heavily from methods used in twill weaving. By the mid-eighteenth century, blocks were used in combination and design techniques specific to block patterns had been developed. The publication, in 1740, of Johann Michael Frickinger's Nützliches Weber-Bild-Buch marked the highest point in the development of block-pattern design techniques in the German linen-weaving tradition.

Weavers of Schachwitz recognized the limitations of shaft looms for creating pictorial designs, but capitalized upon the rectangular nature of block patterns in order to develop an aesthetic of abstract geometric shapes. The visual appeal of this aesthetic transcended the boundaries of class and style, and both the patterns and the design techniques developed by the eighteenth century German weavers of block-pattern damask were to affect textile history in general. During the eighteenth century, weavers in Germany, Scandinavia, and North America began to adapt linen weavers' block-pattern motifs for coverlets and bed hangings. By the end of the eighteenth century, Schachwitz even began to influence designers of Gebild-
damast. Certain German rococo-style draw-loom linens of the 1780s and 1790s incorporated block-pattern designs as fillings within an overall scheme of flowers, fruit, and ribbons. In at least one case, a design in Frickinger's *Nützliches Weber-Bild-Buch* (Figure 55) resembled the ribbon filling of a Gebilddamast (Figure 56).

The place of block-pattern linens within textile history may be yet more fundamental than is suggested by the diffusion of block-pattern motifs alone. The block-pattern concept has become pervasive throughout many branches of weaving. Some cloth structures are now defined explicitly in terms of blocks, and yet others implicitly assume the block-pattern concept [21]. The very idea of a block-pattern fabric (which must not be confused with the simple use of patterns containing squares) appears to have arisen first among German linen weavers. This hypothesis, however, needs further investigation, particularly with respect to the possible influence of seventeenth and early eighteenth century linens from Holland upon those woven in Germany.
END NOTES


3. The only clear definition that I have been able to find for the word Schachwitz appears in Marx Ziegler's *Weber Kunst und Bild Buch*, in Walther C. Hahn, *Die Fachsprache der Textilindustrie im 17. und 18. Jahrhundert* (Dusseldorf: Verein Deutscher Ingenieure, 1971), the glossary lists Schachwitz as a "sort of twill out of Bohemia", but this definition conflicts with usage in the published seventeenth and eighteenth century pattern books, which indicate damask as the fabric structure. Since the German word "Schach" can mean check, square, or chess, "Schachwitz" might be freely translated as "checkered cloth".

4. I have retained the eighteenth century spelling of the word "Theil"; the modern spelling is "Teil". Although German weavers used Theil much as modern weavers use block, eighteenth century German weavers did not use capital letters, A, B, C,... to designate blocks.

5. Hin und Wieder Arbeit was threaded and usually treadled 1... n ...1. For a discussion of Hin und Wieder Arbeit see Patricia Hilts, "Seventeenth and Eighteenth Century Twills: The German Linen Tradition", *Ars Textrina* 3(May, 1985), pp.139-172.

7. Pattern #38 from the *Dritter Theil* used the B and C pair for a motif, but did little with the A and B pair. If two different motifs are worked out using the A and D pair as a star, and the B and C pair for a grid, the result when expanded by the inversion technique will resemble a draft expanded by the rose-fashion block interchange.

8. I would like to thank the Culmbach city archivist for locating material on Nathaniel Lumscher in the Culmbach city archives during my visit in 1981.

9. The only copy of the *Minerva* that I have been able to examine is that located in the Germanisches Nationalmuseum in Nuremberg. This copy may have been disarranged and possibly rebound so as to contain parts of two different weaving books. The references in the text do not correspond to any of the numbers in the plates. However, the block-pattern drafts and treadlings agree with the draw-downs pictured.

10. In many cases the drafts and treadlings contained serious errors, but the intent was nonetheless clear.

11. The long extended treadlings necessary for the pine tree were not possible in the balanced twills used for seventeenth and eighteenth century German linens, but such treadlings can be used in certain weft-faced, bound-weave twills.

12. Pine-tree patterned textiles are in the collections of the Schleswig-Holsteinisches Landesmuseum, Schleswig, and in the collections of the Textilmuseum, Neumünster.

13. The rose-fashion block interchange may have been developed to avoid the complexities inherent in the inversion technique. Developing motifs on adjacent pairs of blocks, A,B and C,D, and then inverting the pairs, was more easily understood than were the pairs that worked with the inversion technique.
14. For an account of J. M. Frickinger and his position as a court weaver see Patricia Hilts, "An Eighteenth-Century German Court Weaver: Johann Michael Frickinger", *Shuttle Spindle and Dyepot* (Fall 1980), pp. 16-19, 58-59.

15. With the exception of the stripe patterns, the specifications for the schwertheilig designs in the Lumscher sequels are extremely difficult to use. The correct orientation of the tie-ups is not easy to determine, and the references as to which tie-ups should accompany which patterns are frequently unclear. Even when these problems are overcome, the tie-ups are often incorrect. The *Minerva* contained no combined-block tie-ups.


17. Lumscher's *Vierter Theil* presented a simpler basket-weave pattern, but the tie-up was incorrect.

18. Patterns published by Frickinger are to be found in the manuscript pattern book of Caspar Peterman held by the Metropolitan Museum, New York, and in the manuscript pattern book of Henrich Leisey held by the Pennsylvania Farm Museum, Lancaster, Pennsylvania. The Joseph Angstadt manuscript published by Ruth Holroyd (see above) also contains a large number of patterns like those in Frickinger's *Nützliches Weber-Bild-Buch*.

19. Some seventeenth and eighteenth century damasks whose original owners are known are in the collection of the Rijksmuseum in Amsterdam. I would like to thank Case Burgers, curator of textiles at the Rijksmuseum, for allowing me to examine these textiles in 1981, and for sharing his research on their background.

LIST OF
EARLY PUBLISHED GERMAN WEAVING BOOKS
(1677-1840)

Marx Ziegler, Weber Kunst und Bild Buch, (Ulm, 1677).


Zierlich-webende Minerva, (Nürnberg: Johann Christoph Weigel, c.1720-1730).

Johann Micheal Frickinger, Nützliches Weber-Bild-Buch, (Schwabach: 1740).

Johann Micheal Kirschbaum, Neues Bild-und Muster-Buch, (Heilbronn, 1771).

NOTES ON THE FIGURES

The first three figures may be considered introductory. Figure 1 defines damask and indicates the type of notation used by modern weavers and by seventeenth and eighteenth century German weavers of block-pattern linens. Figure 2 illustrates the highly-figured Gebilddamast that was woven on complex draw-looms and that had pictorial patterns which contrasted strongly with the abstract, geometric designs of block-pattern damask or Schachwitz. Figure 3 identifies four of the main block-pattern motifs.

The remaining patterns and drafts are placed in chronological order according to the publication dates of the books in which they appeared. For this reason, references to figures in the text do not necessarily follow in the same order as the figures themselves. The grouping patterns is as follows:

Figures 4-9:
Marx Ziegler, Weber Kunst und Bild Buch, 1677.

Figures 10-20:
Nathaniel Lumscher, Neu Eingerichtetes Weber Kunst und Bild Buch, 1708.

Figures 21-32:
Zierlich-webende Minerva, c.1720;
Nathaniel Lumscher, Anderer Theil, 1725;
Nathaniel Lumscher, Dritter Theil, 1727;
Nathaniel Lumscher, Vierter Theil, 1736.

Figures 33-43, 45-51, and 55:
Johann Michael Frickinger, Nützliches Weber-Bild-Buch, 1740.
Figures 52-54:

Draw-downs in the following figures are reproduced from the original pattern books: Figures 21, 23, 24, 26-31, 33 (right), 34-43, 45-51, and 55. All other draw draw-downs were generated with a TRS-80 Color Computer using a program written by Victor Hilts and Patricia Hilts. Where inconsistencies were found between the weaving specifications and the draw-downs given in the original books, I have corrected the drafts, treadlings, and tie-ups to agree with the draw-down.

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I. Damask Draft. Schachwitz or block damask is a damask using 5 shafts per block. The first block, A, is threaded on shafts 1-5; the second block, B, on 6-11; and the third, C, on 12-15. Each additional block requires 5 more shafts. This is modern thread-by-thread notation.

II. Draw-down of Damask Pattern and Structure. The damask structure and pattern that result from the draft in Diagram I and the tie-up in Diagram VI. Dark areas are weft-faced pattern squares, and light areas are warp-faced ground.

III. Profile Draft. Eighteenth-century German weavers used profile draft notation in which each space between staff lines signified a block. Profile notation was used for several different weave structures; in the case of damask each stroke within a space denoted a single 5-thread sequence. Modern weavers call each stroke a unit.
1B. Block Damask Tie-up

IV. Tie-up for a Single Block of Weft-faced Pattern.

V. Tie-up for a Single Block of Warp-faced Ground.

VI. Complete Damask Tie-up. The tie-up for block damask produces a weft-faced pattern on a warp-faced ground. Diagram IV shows the tie-up for a single block of weft-faced pattern, and Diagram V shows the tie-up for a single block of warp-faced ground; each circle represents a shaft that sinks to expose a weft. In the complete tie-up for a 3-block damask each column represents a treadle, and each row represents a shaft. When the shafts controlling block A (first 5 rows) are tied up to weave pattern, the shafts that control the other two blocks (remaining 10 rows) are tied up to weave background. This notation was used by eighteenth-century German weavers and is much like modern notation.

VII. Profile Tie-up. German weavers had no profile notation for tie-ups. In order to save space in this article, I have used the profile notation shown above. Each letter in the profile tie-up represents a block tied up to weave pattern.

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2. Although the tie-up and draw-down shown here are technically 32-shaft Hin und Wieder Arbeit, they illustrate the manner in which the much larger Gebilddamast (picture damask) designs were created. The damask structure was treated as a binding, and the designer was free to make compromises in the structure in order to meet the requirements of the design. In block damask no such structural compromise was possible. The structure of block damask was contained within the unit, and designs were created by placing units next to each other. Georg Sennewald, *Lehr-und Musterbuch des Einfachen Linnen-und Tischzeugweberei*, 1840, Pattern #109.
3. Basic Block-pattern Motifs

I Star. The simplest possible star is drafted on only 2 blocks and is treadled as-drawn-in. More complex stars require more blocks.

II Rose. The rose is derived from the simple star by means of treadling variations that interchange blocks with each other.

III Pine Tree. The pine tree usually required three blocks, but it can be developed from the drafts for many different motifs. The treadling for the pine tree does not follow any particular formula but must be worked out according to the weaver's ingenuity and taste.

IV Snowball. The snowball, unlike the star and the rose, requires that 2 or more blocks be treadled at one time. The German weavers called such patterns "schwertheilig"; modern weavers say that the snowball uses combined blocks.
4. This page from Ziegler’s *Weber Kunst und Bild Buch* of 1677 shows the first stages in the development of a profile notation for block patterns. The block-pattern drafts in the middle and bottom row are the same as the twill drafts at the top except that the lines are vertical instead of slanted. The draft at the bottom uses an inversion of the first half of the draft to develop the second half. As the order of the blocks is inverted, the threading is reversed. (Courtesy Stadt-Bibliothek, Ulm.)
5. Draw-down of the draft at the bottom of Figure 4. Note the consequences of the threading reversal at the point where the blocks are inverted to form the second half of the draft. The twill lines in the dark pattern squares of the upper left half run upwards to the left. In the upper right the twill lines run upwards to the right. An awkward float results at the point where the threading reverses.
6. With the first two block-pattern drafts in his *Weber Kunst und Bild Buch*, Ziegler showed the effect of different sized squares. Both of the above draw-downs have the same number of units, but in the second pattern the units have been arranged on the blocks to give squares of different sizes. The drafts for these draw-downs appear in Figure 4.
7. A page of 3-block drafts with tie-ups for two different weave structures, damask and double-cloth. Weavers had to interpret the drafts as 4 shafts per space with alternating colors for double cloth or as 5 shafts per space for damask. Marx Ziegler, *Weber Kunst und Bild Buch*, 1677, Section #20-21. (Courtesy Stadt-Bibliothek, Ulm.)
8. Draw-down of draft at lower left of Figure 7. This draft used the inversion technique with a grid motif developed on the A and C blocks to give a positive-negative effect.
9. This 5-block draft is set up much like a twill. Ziegler used the inversion technique to develop this draft, and he inverted the threading sequence within the blocks when he inverted the arrangement of blocks. Marx Ziegler, *Weber Kunst und Bild Buch*, 1677, Section #30. (Courtesy Stadt-Bibliothek, Ulm.)
12. Although the draft for this pattern was short, the skillful use of differently sized blocks and the interaction of two motifs gave a surprising amount of interest and variety. Nathaniel Lumscher, *Neu Eingerichtetes Weber Kunst und Bild Buch*, 1708, Section 50 #9 and #21.
13. This pattern shows a fine sense of proportion and a very successful use of the inversion technique. Nathaniel Lumscher, *Neu Eingerichtetes Weber Kunst und Bild Buch*, 1708, Section 50 #10.
14. In this long and complex draft from the *Neu Eingerichtetes*, a pair of star motifs arranged on the B and C blocks was separated by a checkerboard on the A and B blocks. Under the inversion stars alternated with open circles, and checkerboards alternated with fields of dots. Nathaniel Lumscher, *Neu Eingerichtetes Weber Kunst und Bild Buch*, Plate #40.
15. The fully developed profile draft notation in Nathaniel Lumscher's *Neu Eingerichtetes Weber Kunst und Bild Buch* indicates that German weavers had fully mastered the block-pattern concept by 1708. Nathaniel Lumscher, *Neu Eingerichtetes Weber Kunst und Bild Buch*, 1708, Section #51.
16. The first published 4-block wheel pattern similar to "Lovers Knot". Nathaniel Lumscher, *Neu Eingerichtetes Weber Kunst und Bild Buch*, 1708, Section 51 #1.
17. The first publication of a 4-block diagonal pattern now popularly known as "Cat Tracks and Snails Trails". Nathaniel Lumscher, *Neue Eingerichtetes Weber Kunst und Bild Buch*, 1708, Section 51 #2.
18. In this 4-block pattern, a pair of star motifs was arranged on the A and D blocks while the B block was left as a spacer. Under the inversion the star alternated with its expected negative image, but, because of the way in which the inversion acts, the spacer disappeared. Nathaniel Lumscher, *Neu Eingerichtetes Weber Kunst und Bild Buch*, 1708, Section 51 #3.
19. A beautiful 4-block pattern that apparently was not transmitted to modern weavers. Nathaniel Lumscher, *Neu Eingerichtetes Weber Kunst und Bild Buch*, 1708, Section 51 #4.
20. Gesteinte und Gebrochene drafts, tie-up and draw-down. This weave shows complete mastery of the block-pattern concept. German weavers combined two blocks of ordinary damask using 5 shafts per block with a third block made up of repeated point twill on six shafts. Nathaniel Lumscher, *Neu Eingerichtetes Weber Kunst und Bild Buch*, 1708, draft from Section 50 #4, tie-up from Section 40.
21. (left) and 22. (right) The first published pine tree appeared in the *Zierlich-webende Minerva* and in Lumscher's *Anderer Theil*. Unlike patterns in earlier books, the pine tree required treadlings to be written out. The draft for Figure 21, however, was derived by elongating one side of a rose type motif. Figure 21: *Zierlich-webende Minerva*, c.1720, Pattern #D; Nathaniel Lumscher, *Anderer Theil*, 1725, pattern #28. Figure 22: Nathaniel Lumscher, *Anderer Theil*, 1725, pattern #12.
23. (left) and 24. (right) Both of these patterns were made from the same draft. The wheel at the left was treadled as-drawn-in. The Whig rose at the right was the result of applying the rose-fashion treadling--B was treadled wherever A appeared in the draft, and A was treadled wherever B appeared; likewise, D was treadled when C appeared in the draft and vice versa. Figure 23: Nathaniel Lumscher, *Anderer Theil*, 1725, Pattern #4. Figure 24: Nathaniel Lumscher, *Anderer Theil*, 1725, Pattern #1.
This 4-block pattern was developed from a wheel motif that formed the first half of the draft. The second half of the draft was derived by using the rose-fashion block interchange on the wheel motif. When the entire pattern acted as a rose-fashion treadling on the opposite half. *Zierlich-webende Minerva*, c.1720, Pattern #A; Nathaniel Lumscher, *Dritter Theil*, 1727, Pattern #41.
27. A sophisticated draft which employed both the inversion technique and the rose-fashion block interchange. A network of stars and roses resulted from the left half of the draft, which used a rose-fashion block interchange on the A and B blocks and left the C and D blocks for borders. The right half of the draft was an inversion of the left half. Because of the way in which the inversion acts, open circles alternated with the stars and roses. Nathaniel Lumscher, *Anderer Theil*, 1727, Pattern #7.
This pattern created circles around the small roses within the overall Whig rose format by exploiting the effect that a rose-fashion treadling has on blocks written in a twill sequence. *Zierlich-webende Minerva*, c.1720, Pattern #3; Nathaniel Lumscher, *Dritter Theil*, 1727, Pattern #28.
31. Stripes and pine trees. This is the first published example of a "schwertheilig" (combined-block) pattern. The block A that formed the stripe always had to be treadled in combination with any block that formed the pine tree (C, D or E). The block B that formed the clear spaces was never treadled. *Zierlich-webende Minerva*, c.1720, Pattern #E; Nathaniel Lumscher, *Anderer Theil*, 1725, Pattern #21.
32. A well-developed schwertheilig pattern with a bold central motif that exhibited the potential of the combined-block technique. Nathaniel Lumscher, *Dritter Theil*, 1727, Pattern #48.
33. At the right is the first schwertheilig design in Frickinger's *Nützliches Weber-Bild-Buch*. The lattice work figure was derived directly from the rose at the left by combining a single pair of blocks. Frickinger used the leichttheilig tie-up at the left for those of his patterns that would have required rose-fashion treadling. Instead of making the block interchange in the treadling, Frickinger made the block interchange in the tie-up so that a rose-fashion pattern resulted from treadling the pattern as-drawn-in. J. M. Frickinger, *Nützliches Weber-Bild-Buch*, 1740, Pattern #9.
34. Because the block interchanges that so effectively enhanced Leichttheilig drafts did not work with Schwertheilig tie-ups, designers of combined-block patterns had to develop new design techniques. Frickinger often built his complex Schwertheilig patterns from small combined-block motifs. The flower in the center of this 3-block schwertheilig pattern was made from four L-shaped hearts. J. M. Frickinger, *Nützliches Weber-Bild-Buch*, 1740, Pattern #12.
36. The Greek cross provided Frickinger with a particularly versatile module. The lattice above was made from four large crosses and one small one. J. M. Frickinger, *Nützliches Weber-Bild-Buch*, 1740, Pattern #11.
37. The table at the center of this pattern was composed of Greek crosses tightly woven together. J. M. Frickinger, *Nützliches Weber-Bild-Buch*, 1740, Pattern #36.
38. When used both in the positive and in the negative, the Greek crosses yielded an exquisitely delicate snowflake and star. J. M. Frickinger, *Nützliches Weber-Bild-Buch*, 1740, Pattern #37.
39. Frickinger's most elaborate Greek cross pattern was a network of flowers and diamonds. The appearance of the draw-down suggests the inversion technique but the draft was actually more complex. J. M. Frickinger, *Nützliches Weber-Bild-Buch*, 1740, Pattern #54.
In this design Frickinger substituted the snowball module for the roses in a Whig rose format. Creation of the draft, however, was not merely a matter of replacing one set of units for another—Frickinger overlapped the edges of the snowballs so that the draft required only 5 blocks. J. M. Frickinger, *Nützliches Weber-Bild-Buch*, 1740, Pattern #35.
42. In this example Frickinger used an ingenious variation on the pine tree treadling to create Gothic spires from simple stars. J. M. Frickinger, *Nützliches Weber-Bild-Buch*, 1740, Pattern #34.
43. Although these Baroque towers are much more elaborate than Frickinger's Gothic spires, they were developed in a similar manner. J. M. Frickinger, *Nützliches Weber-Bild-Buch*, 1740, Pattern #58.
44. Possibly Frickinger's inspiration for the church steeples in Figures 42 and 43 came from the skyline of Onolzbach (Ansbach) where the towers have remained much as they appeared in the above print from 1690. *Alte Ansbacher Ansichten*, (Ansbach: Ansbacher Buchhandlung, n.d.)
Representative examples of the elaborate stars or snowflakes that are scattered throughout J. M. Frickinger, *Nützliches Weber-Bild-Buch*.

This apparently complex snowflake required only 3 blocks—the same number needed for the basic snowball. J. M. Frickinger, *Nützliches Weber-Bild-Buch*, 1740, Pattern #24.
18, 49 and 50. These three patterns, which resemble Chinese lattice-work, may reflect the eighteenth-century fashion for Chinoiserie.

49. If differently proportioned, this design could have become a Whig rose, but the strong emphasis on the Chinese-style center kept it within the realm of Chinoiserie. J. M. Frickinger, *Nützliches Weber-Bild-Buch*, 1740, Pattern #53.
50. The strikingly modern appearance of the above pattern does not seem so much at variance with eighteenth-century taste when viewed as Chinese lattice work. J. M. Frickinger, *Nützliches Weber-Bild-Buch*, 1740, Pattern #68.
Although simple in appearance, the basket-work figure was difficult to draft. Frickinger added further complexity by placing his characteristic Greek cross in the spaces between the basketry elements. J. M. Frickinger, *Nützliches Weber-Bild-Buch*, 1740, Pattern #56.
52. With its combined-block motif in the block-pattern portion of the draft, the Gesteinte und Gebrochene pattern shown here was different from any previous work in the genre. Johann Micheal Kirschbaum, *Neues Bild-und Muster-Buch*, 1771, Pattern #24.
In this pattern Kirschbaum developed an unusual effect by placing his motifs so that they appeared as cut-outs within the dark squares. J. M. Kirschbaum, *Neues Bild-und Muster-Buch*, 1771, Pattern #55.
One of Kirschbaum's most elaborately-developed patterns was this distinctive Star or Snowflake. J. M. Kirschbaum, *Neues Bild-und Muster-Buch*, 1771, Pattern #59.
55. (left) and 56. (right) By the end of the eighteenth century, Schachwitz had begun to influence the design of other more elaborate textiles. In Figure 56, the filling of the wide ribbon motif that crosses the draw-loom damask woven c.1780 bears a strong resemblance to the Frickinger pattern in Figure 55. Figure 55: Nützliches Weber-Bild-Buch, 1740, Pattern #52. Figure 56: Emil Kumsch, Leinendamastmuster des 17. und 18. Jahrhunderts (Dresden, 1881), Plate #17.