Workmanship as Evidence

A Model for Object Study

Philip D. Zimmerman

SCHOLARS FROM MANY DISCIPLINES have recently turned to objects as sources for understanding the past. Traditionally, things, or objects, have been the domain of art and architectural historians, who have sifted through them in a search for those objects highly charged with cultural values and meaning. Along the way, these scholars have developed effective methods for interpreting imagery and iconography. As the interest in things has expanded into new academic fields and into different types of objects, scholars have generally relied upon available methods of art history. But research objectives are not always the same as before, and the inherent properties of many objects now under scrutiny are not the same as works intended as art. Consequently, efforts to interpret this wider range of material have not always been successful. It is clear that researchers must now reevaluate what kinds of objects may be used in their studies and how this material should be treated.

Models suitable for analysis of decorative arts objects are scarce. Pioneering the few attempts to provide guidelines and direction is E. McClung Fleming's "Artifact Study: A Proposed Model."[1] Fleming assigned five properties that describe the physical artifact and its historical, functional, and aesthetic context. He then identified four analytical steps to be carried out on one or more of the properties. These four operations organize the use of these data into identification (distinctive facts), evaluation (judgments and comparisons), cultural analysis (the artifact within its contemporary context), and interpretation (its meaning and significance in today's culture). Fleming considered these separate operations as stages within a single study with each stage building on the former.

Fleming designed this general and flexible model to "yield answers to most of the important questions we want[ed] to ask about an artifact." His model is particularly effective in showing the complexity and richness of the content of nonverbal documents. It allows a complete and systematic explication of the object. Nevertheless, the model is essentially centripetal—it focuses inward on the artifact as the end product of an investigation. Questions are asked about, rather than of, the artifact. Consequently, most conclusions have limited uses for interpreting the past: they tend to confirm known historical facts. Thus, they fulfill Brooke Hindle's restricted view that "the objects of material culture . . . illuminate the conventional interpretations of our history." If artifacts do possess more than descriptive powers, we must go beyond Fleming's model and devise instead a technique for "reading" the artifact.[2]

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[1] E. McClung Fleming, "Artifact Study: A Proposed Model," in *Winterthur Portfolio 9*, ed. Ian M. G. Quimby (Charlottesville: University Press of Virginia, 1974), pp. 153–73.

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[2] Fleming, "Artifact Study," p. 156; Brooke Hindle, "How Much is a Piece of the True Cross Worth?," in *Material Culture and the Study of American Life*, ed. Ian M. G. Quimby (New York: W. W. Norton, 1978), p. 19. Hindle confines the usefulness of artifact study to satisfying "man's need to touch the past." He does not suggest any way to interpret history directly from artifacts. For one technique that equates physical properties to ideals, see Jules David Prown, "Style as Evidence," *Winterthur Portfolio* 15, no. 3 (Autumn 1980): 197–210. Because Prown must speak for the artifact the artifact is passive in determining the direction and development of study.

Fleming's model contains the germ that can lead us to a fresh historical synthesis. This is an extension of his study, one that Fleming described as "evaluation . . . [based on] factual comparisons of one object with others of its kind in quantifiable terms."[3] On the surface, this exercise produces simple comparative statements that record values of the physical properties of the artifact. These are expressed in such terms as relative frequencies or complexities of certain forms and ornaments. The use of particular materials and construction techniques can also be charted. But at a basic level, the extension differs dramatically from the rest of the model. It moves the focus from the single artifact to the relationships enmeshing the artifact within a group of similar artifacts. As the workmanship model will show, this web is the most important aspect of artifact study.

The web of relationships establishes a variety of artifact properties (for example, degree of decoration, size, age, innovation) through comparisons, correlations, or series. Based solely on intrinsic data such as materials, construction, design, workmanship, and later alterations, these initial relationships do not depend upon historical data, functional analyses, evaluations and interpretations, or other extrinsic matter. Discerning these artifact relationships requires no articulation or interpretation of the artifact's properties or characteristics. The relationships are based on empirical observations, and often a simple yes/no response is sufficient (which introduces the possibility of computer coding and analysis).

Normally, comparative analysis of artifact properties is insufficient basis for historical interpretation. The data are descriptive only and carry no particular significance; when considered as a group of related facts, however, the data can generate a system.[4] Overall similarities among the related artifacts define the boundaries of the system, while differences provide the interpretive substance that researchers can analyze.

If we assume that differences among artifacts are not random, we then can consider them as the artifact maker's response to some changing or changed condition. (The reverse assumption—that the maker is responsible for innovations or other changes—requires knowledge of the maker to explain the artifacts and their differences, thus forcing artifacts once again into a passive role.) As a product of its culture, each artifact embodies conditions, practices, and values of that culture. It also expresses style, a sensitive indicator of many cultural trends, but one that requires judgments, evaluations, or other nonquantifiable interpretations of intrinsic data.[5]

Structuralism provides further direction for reading artifacts. Henry Glassie, a leading spokesman of this approach, outlined a method in *Folk Housing in Middle Virginia.* After recording differences among many generic house-form examples located in two Virginia counties, Glassie identified various patterns that trace these changes and subjected them to a "continual process of abstraction and synthesis . . . to generalize [information]." Next he offered a set of rules that would account for these patterns "in the simplest possible manner." These rules verbalized the link between an artifact and its culture.[6]

The information gained from structural analysis may serve a variety of research objectives. It may add to conventional historical interpretations, or it may be rich enough to stand on its own. Glassie used it to advance several theories about privacy and individualism in the eighteenth and nineteenth centuries. He applied the concepts to his house owners and occupants, a group whose daily lives and values are not represented in written records but are obtainable through artifacts.

In *Hearts and Crowns,* Robert F. Trent used structural analysis to pursue aesthetic rather than historical objectives. He applied the technique to a group of turned chairs from coastal Connecticut so that he could examine certain art historical theories and concepts. Trent's findings disputed the notion that "folk art is a degenerate or a garbled version of high-style forms" and showed that these simple chair forms had their own "artificial systems of compositional logic."[7]

Glassie's and Trent's models formulate guidelines for discerning and patterning differences among the artifacts. A structuralist strat-

[3] Fleming, "Artifact Study," p. 157.

[4] The artifacts are selected for study (that is, related to each other) based on assumptions or circumstances that do not contribute to or effect subsequent analysis.

[5] Philip D. Zimmerman, "A Methodological Study in the Identification of Some Important Philadelphia Chippendale Furniture," in *American Furniture and Its Makers: Winterthur Portfolio 13,* ed. Ian M. G. Quimby (Chicago: University of Chicago Press, 1979), pp. 194–95.

[6] Henry Glassie, *Folk Housing in Middle Virginia: A Structural Analysis of Historic Artifacts* (Knoxville: University of Tennessee Press, 1975), pp. 21, 17. Glassie describes this linkage as "artifactual grammar," a term that at once suggests parallels between speech and artifacts as dynamic expressions of a culture and calls to mind the work of structural linguists, upon which artifact structuralism builds.

[7] Robert F. Trent, *Hearts and Crowns: Folk Chairs of the Connecticut Coast, 1710–1840* (New Haven: New Haven Colony Historical Society, 1977), p. 91.

egy, or "theory of inquiry," avoids a congestion of data by identifying which properties will be studied and by assembling them into a workable and flexible format.[8] Glassie and Trent both selected analysis of form as an organizing factor. Each used a modular unit to describe the fundamental structure of the artifact and all related modifications. Their analyses of formalistic relationships between the base unit and the individual objects yielded a number of results: the persistence of certain forms over time, the degree of variation from a norm, the exploration of ideas such as style drift, and the arrangement of the artifacts into a series. Finally, each interpreted his results as evidence of cultural conditions or change.

Another possible strategy is based on action, or behavior. Here, the base unit is replaced by workmanship, or the process of making, as David Pye defined it in *The Nature and Art of Workmanship.* Pye recognized workmanship as the second of two stages of artifact making, which he described succinctly: "design proposes, workmanship disposes." Further, he emphasized that the quality of workmanship influenced the transformation from design to artifact. "Good workmanship" implements a design accurately, "bad workmanship" does not.[9] By introducing the possibility of bad workmanship into the artifact-making formula, Pye (inadvertently) identified a critical weakness in evaluating artifact differences by projecting backward from the artifact to the design.

How can a researcher differentiate between an accurately reproduced design innovation or modification and a mistake in workmanship that unintentionally altered the form of the artifact? The former should be studied carefully; the latter should be rejected as a "misstatement."[10] If focus is on workmanship rather than design, this problem simply disappears.

As a strategy, workmanship functions in the same way that form does; it shapes the selection and arrangement of data. Although research objectives may be the same for each type of analysis, the strategy change sometimes alters the relative importance of data and may affect the results. The investigator looks for consistencies and differences of workmanship techniques instead of formalistic values. Consequently, rules accounting for an object's design may not coincide with rules that explain the process of making that same object. Accordingly, the interpretive use of these rules may lead to different shades of meaning.[11]

Two analyses of a turned chair illustrate the use and effects of different strategies. After selecting a representative chair, Trent analyzed numerous measurements of its design components and concluded that the chairmaker developed a compositional logic based on one arbitrarily selected linear measurement, the seat depth (fig. 1). This line segment (12⅜ inches in this example), Trent argued, is a constant in the design of the chair. Division of the line into six parts yielded one significant element (2 1/16-inch segment); used in combination as the legs of a right triangle, the two segments produced another significant design element (12⅝-inch segment), as the hypotenuse. Other aspects of the design fit a complex mathematical system in which many small units relate to Trent's base unit.[12] Alternatively, we can use workmanship to explain that same chair's finished form (fig. 2). Trent's measurements show that the length of the rear posts is twice that of the front legs, stretchers, and seat lists (the parts that constitute the seat frame); the side and rear stretchers and seat lists are three-fourths of the length of the front ones. These lengths, which create the basic form of the chair, result from simply doubling (or halving) a given length. The remaining structural details—size and placement of slats and positioning of stretchers—can be explained as a combination of rote practices (setting the seat list 1½ inches from the top of the leg) and simple arithmetic progressions (increasing a given measurement by 1 inch), in addition to doubling or halving.

Both approaches work; however, the outcome is different for each. The formalistic approach examines the conscious (or subconscious) responses of an artifact maker to a design problem. It identifies a rationale, or a "compositional logic," behind the maker's product and thereby imparts meaning to his efforts. The workmanship approach stops short of examining conceptual matters and focuses instead on the worker's performance. It identifies a logic based on how the worker uses the tools and skills available to him.

Structuralist analysis depends upon compari-

[8] See Glassie, *Folk Housing*, p. 14.

[9] David Pye, *The Nature and Art of Workmanship* (Cambridge: At the University Press, 1968), pp. 1, 21–23.

[10] For remarks about "ungrammatical statements" that lie outside "architectural competence," see Glassie, *Folk Housing*, pp. 30–31, 43, 71.

[11] In some cases, design and workmanship stages interact. Traditional techniques, which normally lie within the domain of analyzing workmanship instead of design, may be so strong that they form an essential design component. They may influence, restrict, or even determine part or all of a designer's response to a design problem.

[12] Trent, *Hearts and Crowns*, pp. 25–29.

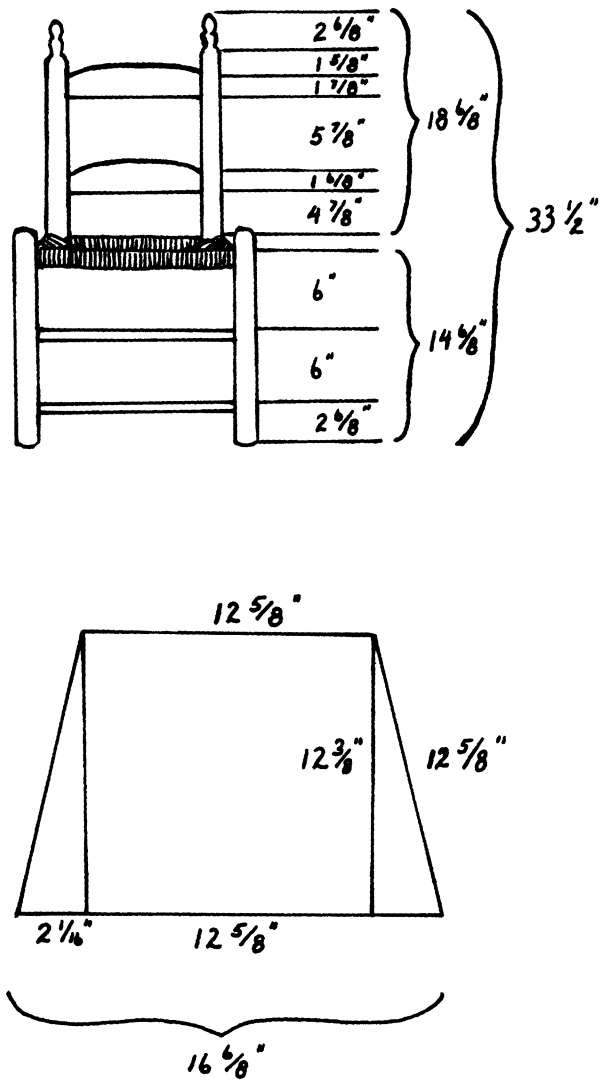

Fig. 1. A turned side chair (measurements in inches). Adapted from Robert F. Trent, *Hearts and Crowns: Folk Chairs of the Connecticut Coast, 1710–1840* (New Haven: New Haven Colony Historical Society, 1977), pp. 26–27, diagrams B and E. (Drawing, Philip D. Zimmerman.)

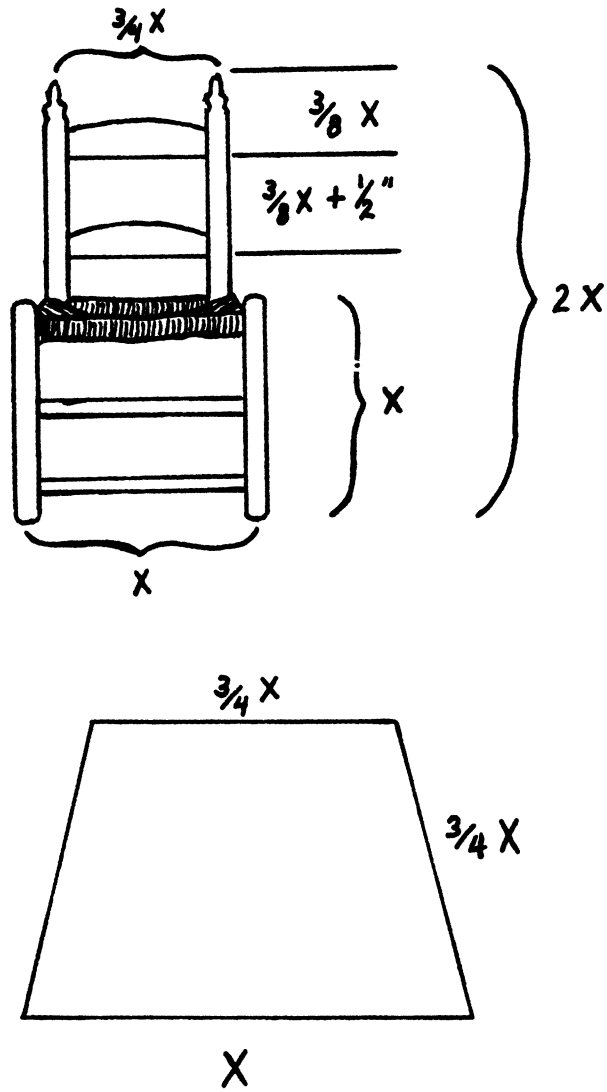

Fig. 2. A turned side chair showing measurements as doubled and halved values of an arbitrary length. (Drawing, Philip L. Zimmerman.)

son. To be effective, it requires a relatively large body of data, either from many whole objects or from many points of comparison among fewer objects. These data must be sufficiently similar to allow interpretation of specific differences among them. Within these boundaries ample choice exists in the kinds of artifacts used, the types of data retrieved from them, treatment of the data, and the objectives of the study. The choice of a strategy, while often influencing these possibilities, does not determine their selection. Instead, the theoretical system of inquiry directs the early stages of data selection and use, which refocuses the theory of inquiry. The interaction between these early ideas and tangible evidence produces a usable strategy.

Pye examined the properties of workmanship and defined two categories, workmanship of risk and workmanship of certainty. The former is work in which "the quality of the result is continually at risk during the process of making." Elaborate hand carving is a good example: a slip of the tool may spoil an entire piece of work. Workmanship of certainty, in contrast, refers to that whose quality "is exactly predetermined."[13] Molds, stencils, and

[13] Pye, *Workmanship*, pp. 4–5.

tools designed to produce particular results control quality and insure a high degree of regularity. While workmanship of risk suggests a fresh undertaking with each piece of work, workmanship of certainty implies the need to produce large numbers of identical products. A pewterer's labor is predominantly workmanship of certainty. Except for finishing work, the quality of his output reflects the level of quality that his molds impart. The process of making the individual molds, however, is workmanship of risk.

Benno M. Forman has suggested the need for a third category of workmanship, best identified as workmanship of habit.[14] It accounts for artifacts that exhibit a remarkable degree of regularity in their workmanship, although by Pye's definition each represents workmanship of risk. Turnings on seventeenth- and eighteenth-century furniture demonstrate such workmanship. Repeated patterns of engraved ornament on silver objects, or hand-cut decoration on early glass also show consistency, approaching certainty, even though the workers used no template, jig, or other guides to control the cutting tool.

The regularity inherent in workmanship of habit can be explained best as the result of a template of action lodged in the mind of the worker.[15] This mental template determines exactly how deep each cut will be and where the next cut will be made. It is a conditioned response that automates the worker in his particular task. As with the worker who may turn hundreds of stretchers or lists in a matter of days, this kind of workmanship depends on the need to repeat the same skill or procedure over and over again. Likewise, the carver may carve the same type of foot so often that there is little difference among his handmade products. Certain construction techniques may also represent workmanship of habit.

Any example of workmanship of habit usually represents only one of many possible procedures. Variations in design, technique, and execution that are characteristic of certain artisans, shops, and geographical regions stem from the persistent reuse of these solutions. This suggests that these resolutions adequately served the artisan over a period of time. Eventually, however, other forces must have altered the original circumstances; changes in the economic climate, in industry practices and technology, and in matters of taste contributed to an artisan's ongoing need to make adaptations and to devise new solutions.

Widespread use of workmanship of habit is tied to specific historical conditions that no longer prevail. Relative scarcity of capital in eighteenth-century America stalled investment in expensive mechanized tools and in other means of quality regulation.[16] Typically, whatever capital could be amassed went into commerce or land.[17] Ventures into more capital-intensive manufacturing rarely generated satisfactory cash flow or returns on investment. Such undertakings often failed, despite tax relief, monopoly interests, and occasional infusions of public funds.[18] Small markets also retarded the growth of more highly mechanized production methods, and low output reduced economies of scale. In summary, the repetitive use of hand skills—workmanship of habit—was a workable means of production despite the relatively high cost of labor. Significant changes during the early nineteenth century altered the means of production for many manufactured goods. The establishment of a domestic capital market enabled manufacturers to invest in new, more sophisticated equipment and in technological research. This produced a much higher level of output and added variety to the goods available to the consumer. Inexpensive, functional side chairs exemplify this

[14] Conversations with Benno M. Forman in 1975 and since.

[15] It is necessary to note that "the worker" may actually represent a tightly organized group of workers, as in a shop. Similarities in workmanship may also occur as a function of common backgrounds in training and cut across shop boundaries in some cases.

[16] Various studies suggest that machine technology existed years before it was put to use on a widespread scale. For example, the circular saw was patented in England by Samuel Miller in 1777 but not introduced into American industry until 1814. See Nathan Rosenberg, *Perspectives on Technology* (Cambridge: At the University Press, 1976), pp. 32–45. David S. Landes attributed the delay in milling-machine improvements in part to lack of demand, although he also cited certain technological breakthroughs that came after the need was recognized (*The Unbound Prometheus: Technological Change and Industrial Development in Western Europe from 1750 to the Present* [Cambridge: At the University Press, 1972], p. 310). For a discussion of the state of manufactures in the United States in the late eighteenth and early nineteenth centuries, see H. J. Habakkuk, *American and British Technology in the Nineteenth Century: The Search for Labour-Saving Inventions* (Cambridge: At the University Press, 1967), p. 92ff.

[17] Victor S. Clark, *History of Manufactures in the United States*, vol. 1, *1607–1860* (New York: McGraw-Hill Book Co., 1929), pp. 144–52; Frederick B. Tolles, *Meeting House and Counting House: The Quaker Merchants of Colonial Philadelphia, 1682–1763* (New York: W. W. Norton, 1948), chap. 5, esp. p. 95ff. The reluctance to invest capital in manufacturing is also implied by the activities of many successful furniture makers and other artisans. They broadened their businesses by investing in a wider range of merchandise, by establishing new markets, or by buying into commercial ventures. They did not invest these funds in developing or improving manufacturing techniques.

[18] Oscar Handlin, *Commonwealth* (Cambridge, Mass.: Harvard University Press, 1969), pp. 68–74, 79–80.

change. In the eighteenth and early nineteenth centuries, these ubiquitous turned chairs were products of workmanship of habit. Later, they were factory-made products of sophisticated woodworking tools and other means of workmanship of certainty.[19]

The vocabulary of workmanship as applied to objects yields a simple interpretive framework. Workmanship of certainty requires the existence of a quality-regulating tool used during fabrication. If the same workmanship appears in a number of artifacts, then the maker must have used the same quality-regulating tool, or identical ones, to execute the component or the property in question. Further, if, for one reason or another, it is unlikely that there were identical tools, then recognizing the same workmanship of certainty in several artifacts establishes a distinct common denominator among them. To establish these relationships, numerous examples of work may be compared to the original regulating tool or a reconstruction if the tool no longer survives. In casting, mold characteristics and defects left by a specific mold identify the objects cast from it. In woodworking, molding planes cut profiles that can be reproduced by mold rules. Finally, in chairmaking, if the nails on a strike pole match the verge marks on turned chair posts or if the location of all verge marks is identical among a group of turned chairs, then it follows that the objects have a common origin.[20]

Discerning an acceptable range of tolerances ensures the accuracy of linking work in question to a specific quality-regulating tool. In most cases, identical pieces of work come from the same source, but an overlap of tolerances may make two or more different pieces appear identical. The possibility of overlap increases as the character of workmanship becomes simpler. Different materials, fabrication techniques, and effects of wear and aging also affect the application of tolerances to some comparisons of workmanship.

Once an adequate technique for identifying identical examples of workmanship of certainty has been established, it is necessary to determine the number of quality-regulating tools used to make them. The existence of more than one tool capable of producing the work in question undermines the use of this method in determining common origins for objects. However, the recurrence of identical quality-regulating tools is rare, perhaps unknown, prior to nineteenth-century mass production. Such tools presuppose manufacture by workmanship of certainty, thus requiring a quality-regulating tool for making tools.[21] Ready-made tools available in America by the late eighteenth century were simple hand tools like gouges, augers, chisels, and planes (often with blank cutting blades to be shaped by the user), and work produced with these tools is too simple to allow identification of specific, regulated workmanship patterns.

Where workmanship of certainty requires repetition, workmanship of risk does not. An objective index (the quality-regulating tool or an accurate substitute) can measure the former, but only subjective analyses can evaluate the latter. Although workmanship of risk shares no intrinsic properties with other examples, this does not preclude the existence of other kinds of relationships among the objects in question. The occasional similarities, perhaps approaching identicality, that may occur between examples of workmanship of risk must be considered accidental because the workmanship lacks the essential ingredient of regulation. Thus, workmanship of risk cannot provide the basis for establishing common denominators or patterns.

Regulated work other than that imposed by tools constitutes the in-between category of workmanship of habit. As the middle of three categories it embraces a broad range of action between two well-defined extremes. The strength of the habit determines the placement of an example of work-

[19] Douglass C. North, *The Economic Growth of the United States, 1790–1860* (New York: W. W. Norton, 1966), chap. 12. A short but informative description of the fabrication of machine-made chairs is found in "Report of the Committee on the Machinery of the United States of America. Presented to the House of Commons, in Pursuance of Their Address of the 10th July, 1855," reprinted in *The American System of Manufactures*, ed. Nathan Rosenberg (Edinburgh: At the University Press, 1969), pp. 170–71.

[20] For interesting studies of this kind in early American glass and pewter, see Dwight P. Lanmon, Robert H. Brill, and George J. Reilly, "Some Blown 'Three-Mold' Suspicions Confirmed," *Journal of Glass Studies* 15 (1973): 143–73; and three articles in the *Pewter Collectors Club of America Bulletin* by Percy E. Raymond: "Crown-Handled Porringers," vol. 3, no. 10 (March 1958): 144–49; "American Pewter Porringers with Flowered Handles," vol. 4, no. 1 (January 1959): 1–9; "American 'Old English' Pewter Porringer Handles," vol. 4, no. 2 (September 1959): 19–25.

[21] A likely place to look for such highly regulated tools is in American arms manufacturing, which best fulfills the preconditions for advanced and innovative manufacturing technology. Large armories had access to capital and to skilled workers; they also operated in a highly competitive market. Recent studies have shown that a high degree of regulation was not achieved in this industry until well into the nineteenth century. See Edwin A. Battison, "Eli Whitney and the Milling Machine," *Smithsonian Journal of History* 1, no. 2 (Summer 1966): 9–34; and Merritt Roe Smith, *Harper's Ferry and the New Technology* (Ithaca: Cornell University Press, 1977).

manship between certainty and risk. Predictability of this habit is manifested in two ways: the degree of precision—will the worker resolve a particular problem the same way each time?—and the degree of uniformity—how regulative is the worker's mental template for doing a specific task? In practice, the strength of the habit often cannot be measured precisely. Variations in degree require both supportive historical evidence and simple empirical samplings that test conclusions. The seemingly approximate relationships based on habit become compelling if few or no exceptions can be discovered. Often the data pool is so limited by low survival rates that this condition can be satisfied with little difficulty.

The workmanship model can be applied to the study of any group of objects. To read objects, each category of workmanship must be tailored to fit the properties and historical contexts of the objects. The outcome of this strategy is a set of mechanical or technical operations to be performed on the objects. Various patterns reflecting similarities and differences within the data pool result from these operations, and they form the basis of interpretations and conclusions.

Workmanship Model: Application

Studies of eighteenth-century Philadelphia furniture have usually focused on the problems of design and style, the circumstances and contributions of important individuals, and the characteristics of specific schools. The shop's role as an organized unit has received only passing notice. Celebrated artisans are described as, or at least assumed to be, shopmasters who employed journeymen and who trained apprentices.[22] They drifted in and out of partnerships with each other and fit within a web of economic relationships with other craftsmen and patrons. Yet somehow, it is argued, through all of this turmoil, products from each shop still retained and revealed their master's "hands."

The means by which the owner exerted his influence and "touch" on every aspect of shop production has not been examined closely and remains a weak link in efforts to attribute furniture to these individuals. The shopowner was but one of many workers; his furniture might easily have been made by him and his workers or by his workers alone. No clear delineation of responsibilities and duties among the workers exists. Indeed, shop organization may have been quite unstructured.

Identifying an individual's work demands that some distinctive component or property of a particular furniture form lay solely within his domain. (This restriction must be effective throughout the given region to avoid duplication.) For example, proportion might be cited as a maker's signature if evidence shows that he characteristically and conscientiously determined this property in his furniture. Likewise, aspects of the design and workmanship of a chairback or any other component might identify an artisan's work. Unfortunately, furniture scholars have not laid adequate groundwork for this treatment of objects. Critical shortcomings exist in our knowledge of individual shopworkers' roles and in our ability to reliably identify examples of their work.[23]

A useful approach is to consider furniture as the product of shops. This viewpoint assumes that the shopowner implemented specific procedures (identifiable today by examining workmanship) that were followed by all of his workers.[24] While established shop procedures allowed fewer opportunities for individual expression, they nevertheless helped maintain a desired level of quality, and, in turn, probably increased shop efficiency.

Both quality and efficiency contributed to a chief concern of the shopowner—making money. This economic factor tends to disappear if furniture is considered as art. When scholars have raised the status of furniture makers from artisan to artist and placed premiums on the value of individual ability and expression, the shopowner's timesaving techniques and cost-cutting measures seem of little consequence, and their effect upon the finished product is often lost.

If furniture is considered as the product of a shop organized by an entrepreneur, we can adapt the workmanship vocabulary to establish an

[22] Although *artisan*, *master*, *journeyman*, and *apprentice* are appropriate period terms, the eighteenth-century furniture industry was competitive and profit oriented. I will use the terms *shopowner* and *worker* in this study to reinforce that view.

[23] The problems of identification and attribution are best illustrated by a dressing table labeled by Philadelphia cabinetmaker Thomas Tufft and a high chest attributed to him on the basis of its appearance. The high chest was later published correctly as the labeled work of William Savery, also of Philadelphia. See Samuel W. Woodhouse, Jr., "Thomas Tufft," *Antiques* 12, no. 4 (October 1927): 292–93; Clarence W. Brazer, "Early Pennsylvania Craftsmen: Thomas Tufft 'Joiner,'" *Antiques* 13, no. 3 (May 1928): 200–205; William Macpherson Hornor, Jr., *The Blue Book of Philadelphia Furniture* (Philadelphia: Privately printed, 1935), frontispiece, pp. xi, 101. For remarks on carving, see Zimmerman, "Methodological Study," p. 199.

[24] See Charles F. Montgomery, *American Furniture: The Federal Period* (New York: Viking Press, 1966), p. 14.

examination procedure. The use of templates (full-size stencillike outlines that functioned as jigs when marking or cutting wood) and other patterning tools on a shop-wide basis resulted in workmanship of certainty.[25] They also represented a dual cost savings. First, the owner spent time laying out the design only once, no matter how many times that design was used. Second, a relatively unskilled worker could use the templates without loss of quality in the piece of work, and the shopowner could assign more highly skilled and highly paid workers to other tasks.

Few eighteenth-century templates have survived. No examples from the Philadelphia region are known; however, Josiah Elfreth and Joseph Clark, whose Philadelphia partnership ended in 1786, owned a "sett of Joiners patterns," and John Janvier's 1801 estate inventory included "1 ps parchment & Chair patterns" along with "sundry patterns."[26] The low survival rate of these artifacts is not a factor of their rarity in the eighteenth century but reflects their lack of intrinsic value and their inherent flimsiness. These thin pieces of wood or of paper were quickly discarded when damaged or when styles and techniques changed.

An examination of Philadelphia Chippendale style chairs shows that templates were used. Eighteenth-century templates for pierced splats (chairbacks) can be recreated accurately by a direct tracing of the splat outline (fig. 3). So many possible variations exist within each design that if a single recreated template fits two or more chairs, then it must represent the eighteenth-century template used to make all of the matching parts.[27]

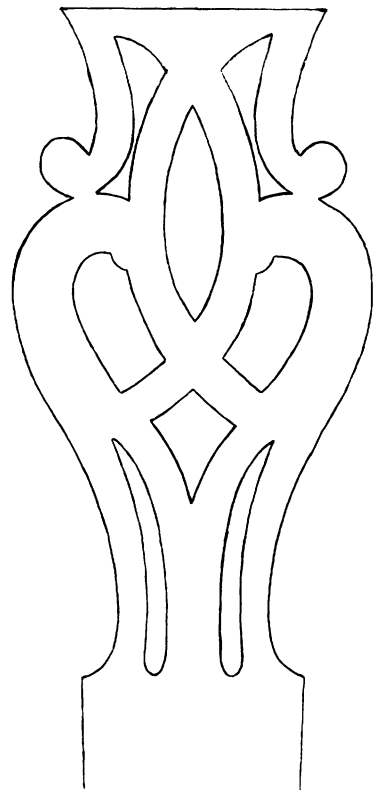

Fig. 3. Acetate template for splat made from direct tracings of the chair shown in figure 4. (Tracing, Philip D. Zimmerman.)

Workmanship of habit is abundantly evident in the appearance and construction of Philadelphia Chippendale chairs. Selection of motifs, their arrangement, and their execution (identified in quantifiable terms of measured proportion and distinctive forms) contribute to appearance. Construction variables include dimensions (which are not affected by wear), choice of materials (which also contribute to appearance), and construction sequences—placement of nails and pegs, types of joints, incidental finishing processes. Since a quality-regulating tool did not determine these properties, full-size templates or other tool facsimiles are unnecessary. These properties can be observed and described verbally.

From the raw data, various frequencies and sequences emerge. These form the basis for rules

[25] In the eighteenth century, templates were called *patterns,* a term that also signified pieces of carved wood used to make impressions for iron casting and paper drawings made to scale that were passed from one party to another to convey designs accurately. See Anne Castrodale Golovin, "Daniel Trotter: Eighteenth-Century Philadelphia Cabinetmaker," in *Winterthur Portfolio 6,* ed. Richard K. Doud and Ian M. G. Quimby (Charlottesville: University Press of Virginia, 1970), p. 163. "The Case of the Joyners Company against the Importation of Manufactured Cabinet-Work from the East Indies" (London, ca. 1710), typescript, Symonds Papers, 75x69.18, pp. 67–72, Joseph Downs Manuscript and Microfilm Collection (hereafter DMMC), Winterthur Museum Library; Ebenezer Call to his brother in Boston, January 15, 1762, Gratz Papers, case 16, box 11, Historical Society of Pennsylvania.

[26] A surviving set of wooden patterns is in the Dominy Collection and illustrated by Charles F. Hummel in *With Hammer in Hand: The Dominy Craftsmen of East Hampton, New York* (Charlottesville: University Press of Virginia, 1968), pp. 96–99; Hornor, *Blue Book,* p. 77; inventory of John Janvier, cabinetmaker of Odessa, Delaware, January 31, 1801, transcribed in Harold B. Hancock, "Furniture Craftsmen in Delaware Records," in *Winterthur Portfolio 9,* ed. Ian M. G. Quimby (Charlottesville: University Press of Virginia, 1974), pp. 205–6. The juxtaposition of parchment and patterns in the Janvier reference suggests that templates may have been made of paper in some cases, but other indications point to wood.

[27] The procedure for examining workmanship of certainty by using templates is explained fully in Philip D. Zimmerman, "The Artifact as Historical Source Material: A Comparative Study of Philadelphia Chippendale Chairs" (M.A. thesis, University of Delaware, 1980), pp. 42–45; the same for workmanship of habit is found on pp. 47–50.

describing the predictable practices and behavior of habitual workmanship. Because these patterns may arise in unexpected areas or fail to exist in others thought to be strong possibilities, it is necessary to collect considerably more data than will probably prove useful.

Researchers should be aware that historical data from other sources (primarily written) may contradict rules derived from these object examinations, and, in such cases, both sets of data must be examined more closely to determine the possibility of error. Conversely, results of object examination may refute written history. Object-derived patterns, however, although real in a statistical or mathematical sense, may not always reflect an actual historical choice—they may correctly record historical events that accidentally fell into a pattern (in which case the sampling is not large enough to overcome the anomaly), or the method of patterning itself may impose an order on the data that is historically meaningless.

The basis for selecting chairs for the present study was simple, and it relied heavily upon existing scholarship. The most important factor was the combination of a pierced splat and a crest rail with projecting ears. Front legs were either "crookt" (cabriole) or "marlborough" (straight). Commonly accepted regional construction practices provided the means for identifying products of the Philadelphia region. These properties included the use of rounded rear legs, through-tenons, and two-piece, vertically grained corner blocks that strengthened the front corners of the seat frame. The absence of one or two of these did not necessarily eliminate an object from the study, although some chairs sharing few characteristics with the majority of the sample were excluded. Chairs thought to be from Philadelphia were not differentiated from those attributed to surrounding towns or colonies. All chairs in the study represented different sets except one side chair and one armchair. The final count was 100 different chairs from all of the major East Coast museums.[28]

Workmanship of certainty is the most reliable way of establishing relationships among the chairs. Identical splat outlines on two or more different chairs confirm the use of templates in their fabrication and at the same time posit a common origin for the work. Except for splats, no other chair parts embody workmanship of certainty; however, workmanship of habit appears in many points, and each represents a regulated stage of production. Admittedly, habit is not completely regulatable, so we must allow for deviation from a norm or variation within a range of possibilities. Where a simple examination of objects will reveal the existence of workmanship of certainty—it either "fits the mold" or not—the method for identifying and evaluating workmanship of habit relies upon two other criteria: frequency and choice.

A relationship based on repeated instances of workmanship of habit must be tested against the entire field of objects before it can be considered reliable or useful. For example, while two chairs may share a certain construction feature, a single observation suggests no particular significance. If further comparison with other chairs shows that the practice in question is common, or even somewhat widespread, then a single origin for the two chairs cannot be postulated on the basis of this one factor. Relationships are strong only when objects share a trait that is exclusively theirs. Thus the frequency of each incidence of workmanship of habit within the entire sample qualifies, or lessens, a property's importance. Some relationships can be based on multiples of weak traits that are insufficient by themselves if the particular combination of traits isolates a group of objects.

A second criterion necessary to determine workmanship of habit is that the significant trait be a choice of the shopworkers and not of the purchaser. The fact that a chair has Chinese lozenges on the stiles is an unsuitable basis for suggesting relationships with others similarly decorated, because that feature probably represents a decision on the part of the buyer. Likewise, the use of ogee moldings or fluting does not demonstrate a common origin. But a small detail, such as the number of flutes that constitute the ornament, is useful. In this case the patron chose which decoration, while the shopowner chose how to meet the buyer's demand by cutting either three or four flutes. As with splats, the shopowner responded to specific instructions but carried out the details of these orders in his own characteristic way. Moreover, he probably continued to use that particular method until some form of outside pressure caused a change. This was not so much an inability to overcome inertia as it was a resistance to change. The introduction of new styles or technology commonly cause change, although either the shopowner or the patron may be the actual catalyst. Some slight change in traditional or habitual practices may occur over time; it can be attributed to "drift," what

[28] Selection of chairs for this study is discussed in Zimmerman, "Artifact," pp. 50–55. Biases in the sample are therein discussed on pp. 57–59.

George Kubler described as the "tiny unwanted variation" that accumulates when an action is repeated over and over again.[29]

A group of four chairs is typical of the groups that emerged from the study. Their workmanship of certainty and of habit demonstrate that despite certain surface differences they are the products of the same shop. Despite few visual similarities, the splat outlines of the two side chairs are identical except at the bases (figs. 4, 5). The splat base of the less ornate chair contains the ogee-shaped base of the other, which suggests that the latter splat (and, by implication, the entire chair) is merely an embellished version of the former. Once this identical property related these chairs to each other, many additional similarities based on workmanship appeared. The two armchairs reinforced this relationship and exposed new areas of similarity, as will be explained below.

No single feature stands out as a "shop signature" for the two side chairs. Instead, a combination of traits distinguishes them from other Philadelphia Chippendale chairs. Each trait represents a choice of the maker, not the purchaser, and will be discussed in order of location on the chair.

1. Quarter blocks secure the splat to the crest rail on each chair. One face of these small pieces of wood is glued to the back of the splat and another face is glued to the underside of the crest rail (fig. 6). This uncommon construction feature does not affect the appearance of the chair but strengthens the tongue-and-groove joint.[30]

2. The shoes that anchor the base of the splat to the rear seat rail have similar profiles and are carved. This evidence, the least reliable of the four properties mentioned here, deserves mention because few Philadelphia chairs have carving on the shoe. Although customers may have specified this minor detail when ordering their furniture, its treatment was probably left to the chairmaker. The distribution of carved shoes among the other groups of chairs in the study supports this view.[31]

3. The inside of the rear rail, which is thinner than the depth of the rear post, is built out with wooden spacers, or blocks, to meet the front plane of the posts. Squared corner blocks were then glued to strengthen each joint of the rear and side rails. Other treatments to avoid notching the corner blocks included cutting the entire rear rail to the same thickness as the posts or laminating a secondary wood onto a rear rail to build up the thickness of this part (fig. 7). None of these techniques save appreciable labor or materials, nor do they affect the outward appearance of the chair.

4. The rear legs on both side chairs are partially rounded. The front and back faces are curved, but the sides are straight, yielding a distinct cross-section (fig. 8). The range of possibilities in these Philadelphia type rear legs also included completely rounded and chamfered legs. Marlborough legs are yet another type, but they were a buyer's preference.

Philadelphia history of ownership for each chair reinforces the attribution of a common origin. The floral-carved side chair has long been identified as part of the household furnishings of the Lambert family of Philadelphia. In 1941, the other chair (or one identical to it) was described as one of five used by George Washington during his stay in Philadelphia.[32] No evidence beyond oral tradition supports the latter attribution (this is one of three sets from Philadelphia thought to have been used by Washington), but the fact remains that the set was found in Philadelphia with a firm area provenance. Thus, extrinsic evidence supports, if only in a general way, the findings of workmanship analysis.

By repeating this method of investigation, we can relate an armchair from the set of Washington-associated side chairs to another armchair (figs. 9, 10).[33] When these two separate armchairs are considered as products of workmanship of habit, numerous common denominators appear that distinguish them from all others. The four points listed above in reference to the side chairs apply to the armchairs, and the armchairs share distinctive properties of their own: four flutes (rather than three) are used on the rear posts, the flutes are interrupted at the juncture of the arms in the same way, through-tenons secure the arms to the posts, and the arms lack knuckled terminations.

[29] For a concise statement of the forces at work, see George Kubler, *The Shape of Time: Remarks on the History of Things* (New Haven: Yale University Press, 1962), pp. 77–82, 60–61, 71–72.

[30] Ten of the 100 chairs in the study used this construction technique.

[31] Of the 100 chairs in the sample, 19 (including the 4 in this group) had carved shoes. All but 4 of these chairs fell into distinct groups based on the use of identical splat templates. Two of the groups contained one additional chair that did not have a carved shoe. Carved-shoe distribution according to group is as follows: 4 of 4; 4 of 5; 3 of 4; 2 of 2 (2); 1; 1; 1; 1.

[32] For the Lambert chair, see Hornor (*Blue Book,* p. 216), who suggested that the chair was originally part of a set of eight. For the set used by Washington, see Stephen Decatur, "George Washington and His Presidential Furniture," *American Collector* 10, no. 1 (February 1941): 9.

[33] Joseph Downs recognized this relationship in *American Furniture: Queen Anne and Chippendale Periods* (1952; reissued, New York: Viking Press, 1967), figs. 37, 38.

A feature peculiar to the "ribbon-back" armchair (fig. 10) and the Lambert side chair (fig. 5) draws the chairs in this group closer together, even though they were originally related to each other only through the Washington-associated side chairs and armchairs. The maker chose to embellish the rather common strapwork splat of the Lambert side chair by shaping the sides of the base and by drilling a center hole. This method of providing an extra bit of ornamentation also appears in the base of the ribbon-back armchair splat. Typically, chairmakers either left this lower triangular mass solid or followed its outline by cutting a pierced triangle. The choice of a drilled hole is unknown outside this group of chairs.[34]

The four chairs demonstrate how patterns of workmanship of certainty and of habit can be recognized and used to identify relationships among Philadelphia Chippendale chairs. Subsequent use of the data is twofold. First, specific conclusions can be drawn from the particular grouping of objects. The chairs can be identified as products of the same shop. Had one chair been labeled or the maker known by some other means, then the others could also be ascribed to him. But the value of these immediate results is limited until they have undergone an "abstraction process" in which they are generalized and applied to larger issues.[35] In this, many of the immediate findings may prove incidental or unsuitable for interpreting the objects further. Their limitation is shown by the significance of a drilled hole in the base of the two splats: it is important in assigning chairs to this particular group, but it has little importance beyond that.

Other observations lead to larger issues. For example, differences in the character of carved work and other decorative details evident in the four chairs raise the question of how much variation is possible in work from a single shop. The answer affects our understanding of how these chairs were made and how other chairs should be perceived. Likewise, the appearance of standardized parts as seen in the side-chair splats contributes to our general knowledge of furniture-making practices.

[34] For another example with triangular openings, see Patricia E. Kane, *300 Years of American Seating Furniture: Chairs and Beds from the Mabel Brady Garvan and Other Collections at Yale University* (Boston: New York Graphic Society, 1976), fig. 96. Robert Bishop illustrated another chair with a drilled hole as fig. 152 in *Centuries and Styles of the American Chairs, 1640–1970* (New York: E. P. Dutton, 1972), pp. 132–33. On the strength of photographic evidence, this chair probably belongs in the Washington-Lambert group.

[35] Glassie, *Folk Housing*, p. 21.

The differences between the two side chairs are more than mere substitutions within a larger framework of uniformity. Although some details are interchangeable—like vine-carved posts for fluted ones or a scalloped front rail for a more common manner of lightening its appearance—the chairs have substantial differences in form and organization. In overall terms, the decoration on the Washington chair fits within a range of ornament common among stylish Philadelphia Chippendale chairs, but that on the Lambert chair lies considerably outside it. Specifically, the typical rolled-back ears with volutes carved into their sides on the Washington chair are, in effect, turned nearly 90 degrees and are planar in the Lambert chair. This gives a completely different appearance to the two crest rails. The carved shells also have differently organized design elements. The distinctly oval shell falls within the conventional Philadelphia idiom; the shell flowing into other carved details on the Lambert chairback is out of the ordinary. The placement of carving on the Lambert chair distinguishes it from most Philadelphia Chippendale chairs. Whereas some other chairs have carved posts and shoes, very few are carved along the seat-rail moldings or have foliate-carved front rails. Another difference is the shape of the front legs at the knee. The juncture of the leg and seat frame breaks on the Washington chair. In contrast, these two segments flow together, as on many English examples, on the Lambert chair.

The many visual discrepancies between these two chairs violate the concept of a habitual response to a particular problem—ornamentation in this instance. These differences in turn could lead to the suggestion that the two chairs had separate origins despite the strongly similar patterns of workmanship evident in their construction. One solution to this apparent dilemma is to recognize that these and most other Philadelphia Chippendale chairs were not the products of a single worker but of a shop that combined skills of many workers and that operated within a competitive industry.

Each chair was the result of numerous tasks—cutting, shaping, fitting, carving, and so on. These were not necessarily performed by the same worker nor was the level of skill required to complete each task always equivalent. Some jobs could be performed in the same way regardless of the design of the chair, others could not. Those in the former category, such as cutting and joining seat rails, shaping rear legs, and cutting splats from solid stock, could be made easier by templates, standardized techniques, and other work-

Fig. 4. Side chair, Philadelphia, 1760–80. Mahogany; H. 41¾″, W. 23½″. (Winterthur Museum.) Possibly part of George Washington's furnishings during his stay in Philadelphia.

regulating measures. These factors cut labor costs without significantly affecting the appearance of the final product. The finishing stages of chairmaking generally fell outside the scope of shopwide controls. These details met the demands and expectations of the customer, who selected various decorative motifs and carved work and addressed other style-sensitive matters. At times, the desired results required using specialized and highly skilled workers. Always, the customer paid according to the amount and quality of the work.

Outward differences among the chairs stem from different customer demands. It is impossible to say whether, in satisfying them, the shopowner remained within the capabilities of his own shop or whether he had to hire outside carvers or other workers to complete the work.[36] Regardless, the

[36] Accounts beginning in 1768 show that shopowner Benjamin Randolph, a carver in his own right, apparently employed Hercules Courtney, carver, and John Pollard, joiner and carver, on a regular basis for shop work (*Philadelphia: Three Centuries of American Art* [Philadelphia: Philadelphia Museum of Art, 1976], pp. 111–12, 114). Other references to hiring outside workers include: Daniel Trotter, debtor to John Morris, for

Fig. 5. Side chair, Philadelphia, 1760–80. Mahogany; H. 41 3/16″, W. 24⅜″. (Winterthur Museum.) Probably from a set made for the Lambert family.

problems this job specialization creates are the same when we examine objects as anonymous artifacts. Similarities among objects may exist within certain stages of their manufacture and at that level point to a common origin. Differences in surface treatment and other style-sensitive features may indicate separate origins for that particular work. Finally, the fact that chairs were made in stages—general chairmaking tasks and then specialized embellishment—requires that we treat each stage separately. Until we better understand the role and contribution of specialists, analysis of their workmanship cannot establish shop origins with any certainty.

The armchairs of the Washington-Lambert group illuminate the effect of customer demands. Here the use of interchanging parts rather than

"carveing 8 chair backs" in 1796 (Golovin, "Daniel Trotter," p. 163); and in David Evans's account book, March 12, 1779, "Paid Isaac Barnet and agreed with him as follows: NB he wants to make me a Set of Chairs for £12.0.0. . . . He put all the Backs for 6 chairs together and also the front rails" (Dard Hunter, Jr., "David Evans, Cabinetmaker: His Life and Work" [M.A. thesis, University of Delaware, 1954], p. 16).

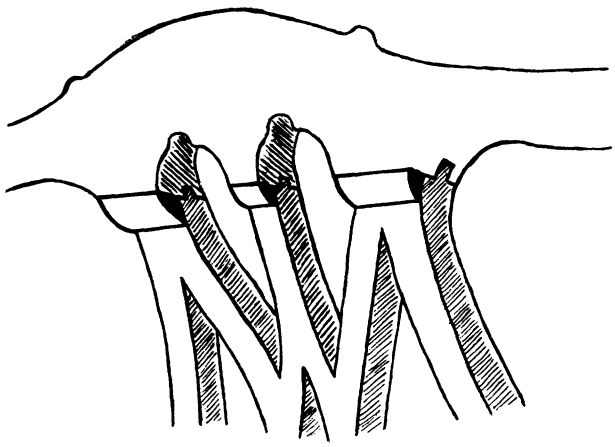

Fig. 6. Rear juncture of crest rail and splat reinforced with quarter blocks. (Drawing, Philip D. Zimmerman.)

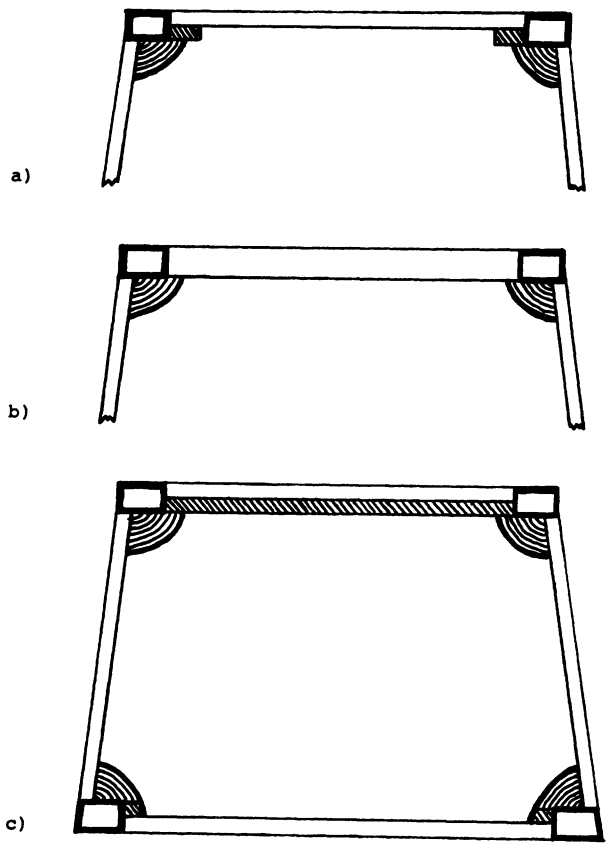

Fig. 7. Plan of seat frame construction: *a*) rear rail with blocks, *b*) flush rear rail, *c*) laminated rear rail. (Drawing, Philip D. Zimmerman.)

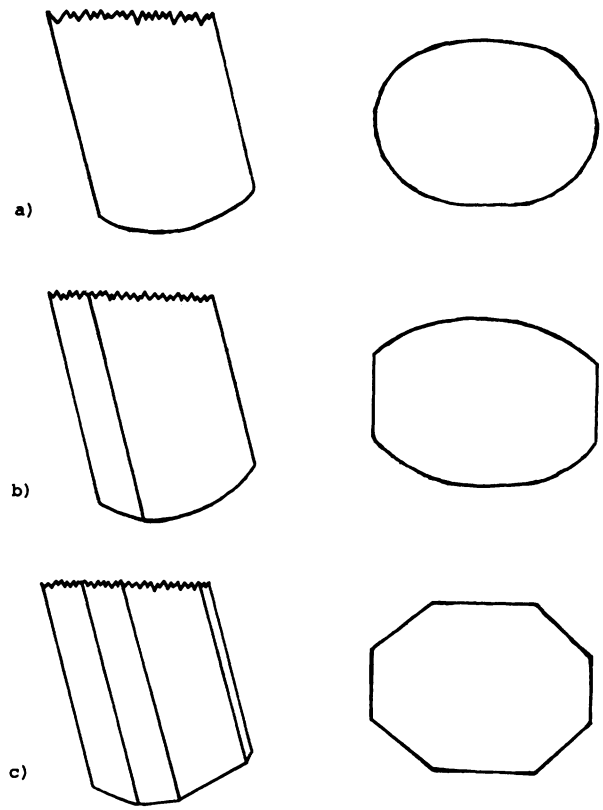

Fig. 8. Partial views and sections of three types of rear legs: *a*) rounded, *b*) rounded with straight sides, *c*) chamfered. (Drawing, Philip D. Zimmerman.)

the employment of different workers satisfied the demands for ornament. Except for three features—the different splats, the shape of the front rails, and the use of a carved motif above the juncture of the front legs and rail of one chair—the armchairs are identical. The presence of interchangeable splats on these chairs suggests that other splat designs could have been used as easily. In most cases, probably any splat from that shop could have been integrated into the surrounding framework with little alteration. The deep front rail of the ribbon-back armchair is clearly a feature added to the basic form to conceal a chamber pot. This particular adaptation required additional labor and materials, and both were no doubt reflected in the price of the chair. The third difference is minor and may have been left to the discretion of the shopowner. Indeed, rather than stipulating each detail, customers may have ordered their chairs by making reference to a neighbor's set and asking for certain general changes.

In sum, examination and interpretation of the Washington-Lambert group of chairs suggest that individual shops made standardized products that were adaptable to the customer's specific demands. The range of style-sensitive features any one shop could offer had to be broad enough to satisfy many tastes yet economical to execute. These cost-saving measures revealed themselves in various forms of regulated workmanship.

Among chairs made in the same shop and sharing the same splat design, countless small decorative and structural details distinguish various sets. They may differ in the number of lobes (five or seven) that make up a shell applied (facing up or down) to the front rail; in the use of hollows or ogees with or without fillet moldings that terminate the undercut front, side, or back rails; and in many carved details, to name only a few. So much opportunity existed for variation among these details that some change invariably occurred from one set to another. In contrast, chairs from the same set are identical. Shopowners and workers paid careful attention to reproducing each feature on all the chairs in a set. Accordingly, any differences among chairs of a set must be accountable as subsequent alterations (for example, wear, damage, repairs, or restoration); otherwise, the chairs are from different sets.

Variations among chairs from different sets made in the same shop improve our understanding of shop practices. Heretofore, the many small changes have either been neglected or have been presented as by-products of a nonmechanized industry. In the latter view, the worker was given considerable latitude in which to modify and innovate since so much handwork was involved. These variations have also been ascribed to a worker's opportunity or need to express himself creatively. However, the more pronounced changes from chair set to chair set point to a clear pattern of change within shop-defined boundaries. Furthermore, object examination demonstrates that most chairs were designed and engineered to allow for interchange and modification of parts. The impetus for change, then, stemmed more from the shopowner/designer than from the nature of the craft.

The most visible changes among chairs from a single shop are substitutions of major parts—splat, crest rail, and legs. Specific crest-rail designs tended to accompany particular splat designs. A notable example involves three chairs. Two are marlborough-leg chairs that are identical in all respects except one has a Gothic splat and crest rail, the other has a trefoil splat and rolled crest rail (figs. 11, 12). A third chair of this group has the same trefoil splat and rolled crest rail but has cabriole legs (fig. 13).

The major parts created the outline of a chair. Undoubtedly, some customers were satisfied with chairs assembled without modification from standardized parts and ornamented with popular features like molded posts, relief carving on the splat, and simple shells on the knees and the crest rail. Many such chairs were, no doubt, made on speculation by shopowners and sold in their shops as ready-made wares.[37] But an essential aspect of business was making furniture to order and keeping it within reasonable terms. Using standardized parts and techniques in the early stages of design and production allowed shopowners to satisfy individual customers' demands and still maintain a competitive edge.

Examination of ornate and high-quality chairs reveals that standardized parts were modified in simple ways to alter the visual impact. Two side chairs made in the same shop demonstrate this technique (figs. 14, 15). Both chairs have the same splat template and share many decorative and structural characteristics, yet one is tall and lean, the other is broad and short. Some furniture aestheticians have singled out the shorter chair as a paragon of urban high-style design and proportion; however, the length of certain parts is the only difference between the two chairs.[38] The seat rails are cut slightly longer on the shorter chair thus emphasizing its breadth. Verticality is achieved in the taller one by extending the splat two inches at the base and the posts two inches at the top. The crest rails on the two chairs measure within one-fourth inch of each other. Thus, two quite different effects were achieved while using standardized parts.

Adjusting a splat at the base to fit into the space determined by the crest rail height was common. In this way, the same splat template could be reused regardless of the overall chair height. In general, the splat design imposed the minimum height for the back. Once the flexibility provided by the solid massing at the base was used up, any further shortening of the part would cut into the design (although straps at the top of many splat designs could vary in length about a half inch). On one occasion, a worker circumvented even this size limitation to avoid remaking a template to fit a short, broad chair. Using a standard template, he shortened the entire splat design by removing a horizontal strip from the middle of the design. This timesaving technique is invisible and un-

[37] For examples, see advertisements of Francis Trumble (1754) and Samuel Walton (1785) for ready-made furniture in Alfred Coxe Prime, *The Arts and Crafts in Philadelphia, Maryland, and South Carolina, 1721–1800* (1929; reprint ed., New York: Da Capo Press, 1969), p. 184. See also Montgomery, *American Furniture*, p. 14.

[38] See Albert Sack, *Fine Points of Furniture: Early American* (New York: Crown Publishers, 1950), p. 40; and John T. Kirk, *American Chairs: Queen Anne and Chippendale* (New York: Alfred A. Knopf, 1970), pp. 170–72.

Fig. 9. Armchair, Philadelphia, 1760–80. Mahogany; H. 42⅛", W. 27⅝". (Winterthur Museum.) From the same set as the side chair in figure 4.

detectable without actually experimenting with a template (fig. 16).[39]

Modification of standardized parts in order to hold down costs played a key role in the manufacture of armchairs—or what appear to be armchairs. True armchairs differ from side chairs not only by the addition of arms but also by larger overall dimensions and heavier parts throughout. Only the front legs—standardized at a height of about 17 inches—remained the same.[40] The increased size was reflected in a greater price. If a shopowner had to produce a second set of templates to proportionally increase all of the elements of the armchair, it raised the cost even more. Such nonrecurring expenses could have been spread over many sales had armchairs been made in any great numbers. But armchair production was low, probably no more than a few per year

[39] The template that matched the chair under discussion (Metropolitan Museum of Art, 08.51.10) was drawn from one of a set of four chairs at Winterthur Museum (60.1066.1–.4). These four chairs are discussed further in Zimmerman, "Methodological Study," pp. 196–99, where they are related to another set of Philadelphia Chippendale chairs on the basis of workmanship of habit and historical evidence.

[40] Thomas Chippendale suggested a seat height of between 17 and 18 inches in his influential *Gentleman and Cabinet-Maker's Director* (1762; reprint ed., New York: Dover Publications, 1966), p. 3. Thirty-three of the 100 chairs in this study were published with seat heights in either Kane, *300 Years*, or Kirk, *American Chairs*. According to their measurements, 30 seat heights were between 16½ inches and 17½ inches.

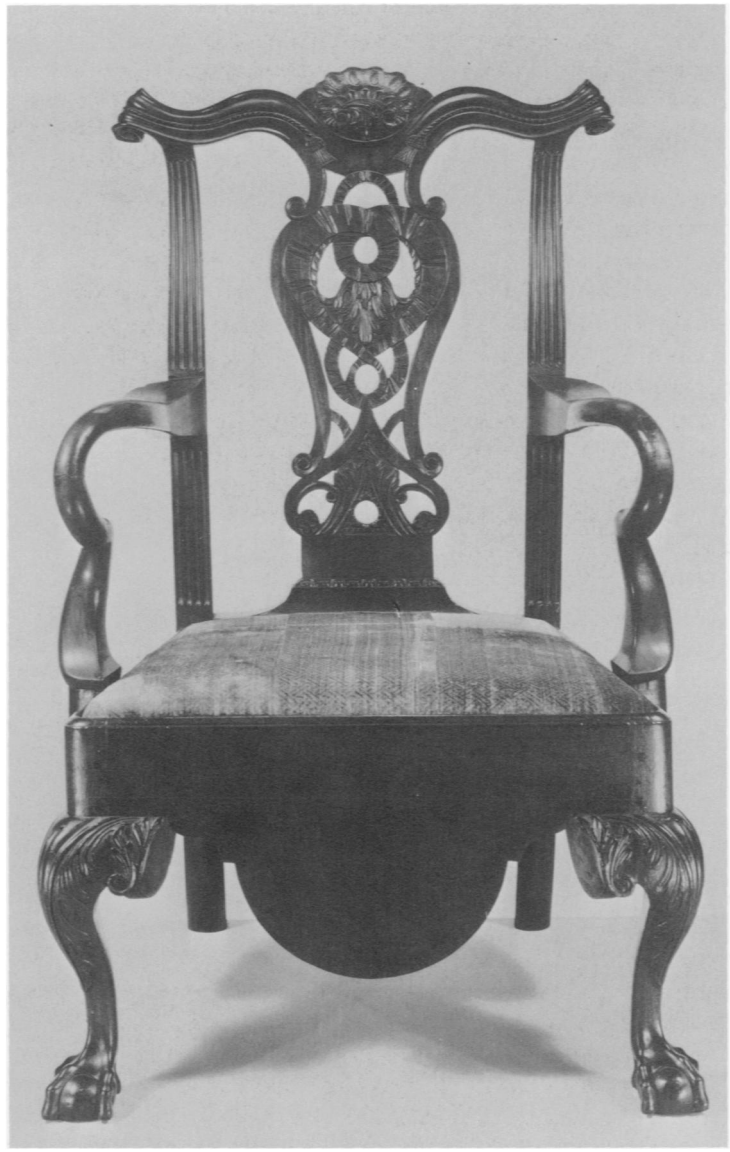

Fig. 10. Armchair, Philadelphia, 1760–80. Mahogany and tulip; H. 44″, W. 27⅛″. (Winterthur Museum.)

even in the largest shops.[41] Consequently, a premium had to be charged.

To combat one-time design costs, chairmakers offered alternatives. Simplest was to use an existing side-chair splat template by extending it at the base to fit into the larger armchair. This produced an armchair with a side-chair splat (fig. 17). This practice altered the appearance of the chair somewhat: the narrower side-chair splat leaves large spaces on either side between it and the posts and a large solid mass at the base of the splat. Alternatively, the maker could merely install arms on a side chair. This added to the price of the chair but was considerably less than the price of a full-size armchair.[42] Examples with arms removed best illustrate the ease with which a side chair was converted to an armchair. They are indistinguishable from any other side chair except for repairs to the

[41] Chair production in David Evans's shop between 1774 and 1781 totaled 142 side chairs and 2 armchairs. He made 9 more armchairs between 1781 and 1810 (Hunter, "David Evans," appendix B). Chair production "from all known accounts" in Daniel Trotter's shop between 1779 and 1796 totaled 48 side chairs and 2 armchairs; undated entries totaled 48 and 5 respectively (Golovin, "Daniel Trotter," pp. 182–83).

[42] A 1772 Philadelphia furniture price list indicates that armchairs with pierced splats and claw feet cost £3 while side chairs cost £2. Hornor cites a price of 10*s.* 6*d.* for adding arms to a side chair (*Blue Book*, pp. 215–16). Personal estate inventories, which ordinarily might be helpful in this area, do not distinguish between armchairs and side chairs with arms.

Fig. 11. Side chair, Philadelphia, 1760–80. Mahogany; H. 38¼", W. 22". (Winterthur Museum.)

Fig. 12. Side chair, Philadelphia, 1760–80. Mahogany; H. 37⅞", W. 22⅛". (Winterthur Museum.)

posts and side rails where arms were once fitted (fig. 18).

Shopowners had a third technique for reducing costs as two chairs from an original set of six side chairs and two armchairs show. These chairs, probably made in Delaware, have an unusual splat design that may have been made to fill this order only. Regardless, the same splat template was used in both the side chair and the armchair. The compromise splat is nearly of armchair size and crowds the space on the side-chair back (figs. 19, 20).[43]

Shopowners could also cut costs in their methods of attaching arms to posts (fig. 21). In the more time-consuming method, the arm was tenoned, pinned, or screwed into a projecting nodule. Alternatively, the arm could be cut to fit around the post or channeled into it (fig. 21). Eliminating the nodule in the latter technique saved labor otherwise spent measuring off and working around the projection. Moreover, multiple fabrication was possible since the posts for both armchairs and side chairs were the same, except in length, which was probably adjusted when the parts were assembled.[44]

An arm-post joint with a nodule may have been slightly stronger than one without, but either was sufficiently strong to withstand most stresses. The

[43] John A. H. Sweeney discusses the side chair in *Grandeur on the Appoquinimink: The House of William Corbit at Odessa, Delaware* (Newark: University of Delaware Press, 1959), p. 112, pl. 4; it was probably among the "6 best Mahogany chairs & 2 arm chairs" divided in 1845 between two heirs of the original owner (p. 101). Joseph Downs misattributed the chair to Philadelphia in *American Furniture*, fig. 44. Slight variations between the splats of these two chairs disappear when the template is reversed. The chairmaker apparently flipped the template between tracing the two splats.

[44] Supports for the arms were secured to the side rails in one of two ways—either contoured to fit around the molding at the top of the rail, or fitted into a measured cut in the side-rail molding. Both methods involved approximately equal amounts of cutting and fitting; use of one method over the other probably followed shop practices.

Fig. 13. Side chair, Philadelphia, 1760–80. Mahogany; H. 38⅝", W. 20⅞". (M. & M. Karolik Collection, Museum of Fine Arts, Boston.)

marginal differences in appearance and in structural strength between them obscure the reasons for selecting one joint over the other. Most likely, standardized shop-wide practices determined this choice: shopowners favoring more massive elements and more complex joints—visible as thicker seat rails, more pins used in mortised joints, double through-tenons in large armchairs—selected the nodule joint. Shopowners also regulated the fitting of arm supports, either contouring them around the side-rail molding or cutting them into it. Customers indirectly expressed preferences in this area by choosing a shop based on the kind and quality of furniture it produced.

Object examination cannot establish the extent of standardized parts and parts substitution in Philadelphia. The available sample of Chippendale chairs is too small to plot clear boundaries of use, and the lack of exact geographic origins (city versus region) for most precludes useful estimates. Written references do not help in this regard. The techniques and skills of the furniture maker were passed from one person to another by oral explanation or by demonstration and were not the subject of written accounts. In an indirect way, written records do confirm these practices and give some sense of the quantities involved.

Estate inventories of furniture makers in Philadelphia and elsewhere verify the practice of stockpiling furniture parts. Among the parts listed in Joshua Moore's 1777 inventory are: 8 mahogany back feet, 4 sets of mahogany and 1 set of walnut table legs, a "quantity of table feet," 159 walnut and 62 mahogany banisters (splats), and 13 tea-table "pillers" (columns). Thirty years earlier, Joseph Armitt had "72 banisters for chair backs" at one time, presumably at his death. Other inventories list chair rails and feet, crooked chair backs (cyma-curved posts), and numerous parts for turned chairs.[45] Although these references identify what parts were stockpiled, they do not reveal who cut these parts. Most were probably made in the shop for shop use by employees working to designs and standards set by the owner, but jobbers did supply some parts to the trade as did large shops that sold surplus stock or possibly produced parts for sale intentionally. In 1767, cabinetmaker Samuel Williams advertised for sale mahogany and walnut tea-table columns and sets of bed posts "fit for immediate use." At the end of the century, Francis Trumble, another furniture maker, offered "a quantity of mahogany and walnut chairs and table feet, bannisters, &c. Mahogany veneers, carved work for furniture, etc."[46]

Written references to stockpiled parts confirm a degree of parts standardization. Precut parts must have been essentially uniform since the shopowner could have realized little or no economic benefit if each part required much fitting and modification. However, we still have questions about the extent of standardization. Were feet carved out completely? Or, was their shape merely blocked out leaving carving and finish work? Were

[45] Nancy Ann Goyne, "Furniture Craftsmen in Philadelphia, 1760–1780: Their Role in a Mercantile Society" (M.A. thesis, University of Delaware, 1963), pp. 214–15; Hornor, *Blue Book*, p. 207. For additional references to furniture parts, see pp. 127, 143, 165, 208. See inventories of Daniel Jones (June 16, 1766) and William Davis (July 20, 1767) transcribed in Goyne, "Furniture Craftsmen," pp. 207–10; and Timothy Hanson (December 18, 1798), Ziba Ferriss (May 15–16, 1796), and John Janvier (January 31, 1801) transcribed in Hancock, "Furniture Craftsmen," pp. 203–6.

[46] Williams's advertisements, September 9, 1767, June 12, 1769, June 2, 1773, and April 16, 1783, and Trumble's advertisement, March 13, 1798, are transcribed in Prime, *Arts and Crafts*, 2:198–99.

Fig. 14. Side chair, Philadelphia, 1760–80. Mahogany; H. 41½", W. 20¼". (M. & M. Karolik Collection, Museum of Fine Arts, Boston.)

Fig. 15. Side chair, Philadelphia, 1760–80. Mahogany; H. 39½", W. 21¼". (M. & M. Karolik Collection, Museum of Fine Arts, Boston.)

splats merely blanks, cut to shape only along the outside edge? Or, was the entire design already pierced and the inside edges chamfered and smoothed? Most important, were mortises precut, holes for pins drilled, and other fitting and assembling steps taken before the part was designated for use? This last question presumes a degree of standardization that exceeds the conditions implied by the former questions. It suggests that certain aspects of overall construction may have been standardized. If so, for example, a shopowner may have standardized front legs in height and shape, making all claw feet essentially the same, the curve of the leg the same, and the massing of the knee the same (sufficient to allow shells or leafage to be carved at a later time). Further, precut mortises on these legs would require tenons of a predetermined size, which might influence the size of the rails. Other predetermined features of construction would affect other aspects of the design and appearance of the chair in similar ways.

The degree of standardization probably varied from shop to shop and changed over time within a single shop. Some shops may have standardized certain parts or construction techniques that others did not. Even within a shop, the degree of standardization may have changed, especially as the nature or volume of the shop's output changed. Some originally specializing in turned furniture may have broadened their range of products to include a larger selection of joined furniture or shifted emphasis from joinery to turnery. These shifts required, or reflected, changes in personnel, shop organization, tools, and templates. Moreover, the dissolution or establishment of partnerships and the sales of sets of tools or entire shop contents affected parts standardization.

Fig. 16. Side chair, Philadelphia, 1760–80. Mahogany; H. 36¾", W. 24½". (Metropolitan Museum of Art.) Feet are replacements.

Fig. 17. Armchair, Philadelphia, 1760–80. Mahogany; H. 39¾", W. 23¼". (Winterthur Museum.) Seat was once fitted for a chamber pot.

Some furniture parts were standardized throughout the industry. Surviving manuscripts identify two kinds of parts—small ornamental work and large turned parts, but they connote particular circumstances. Workers with specialized skills filled the rather limited demand for ornamental goods. Merchants and artisans able to obtain lumber in quantity had some of it turned to make simple and often-needed parts which they then sold to the trade with other precut boards and scantling. Sources for parts shifted from one person or establishment to another depending on who was able to secure shipments of wood; however, many merchants and artisans with reliable trade connections probably were constant and dependable suppliers. The haphazard survival of manuscript sources makes tracing the extent of standardization practices difficult. A 1772 Philadelphia furniture price list suggests that these practices were widespread. Two manuscript copies of it survive. One is undated and unsigned, the other was copied in 1786 by Benjamin Lehman, a Germantown carpenter and lumber merchant. The Lehman copy is sufficiently like the undated one that historians have concluded it too was copied from the 1772 list, which indicates that the 1772 price list remained in use for a number of years.[47]

The 1772 price list presents a picture in which furniture forms were modified to meet customer demand. For example, an armchair with solid splat, cabriole legs, and plain feet cost £2.18.00, but the same chair with a "cut through bannester"

[47] The format, vocabulary, and rates in the two books are nearly identical. See Martin Eli Weil, "A Cabinetmaker's Price Book," in *American Furniture and Its Makers: Winterthur Portfolio 13*, ed. Ian M. G. Quimby (Chicago: University of Chicago Press, 1979), pp. 176–77, 180 (the entire price list is photographically reproduced on pp. 180–92); and Harrold E. Gillingham, "Benjamin Lehman, a Germantown Cabinetmaker," *Pennsylvania Magazine of History and Biography* 54, no. 4 (1930): 289–306 (includes a transcript). New Philadelphia price lists were issued in 1794, 1795, 1796, and 1811. Hornor, *Blue Book*, pp. 83–84; Montgomery, *American Furniture*, pp. 21, 488.

Fig. 18. Side chair, Philadelphia, 1760–80. Walnut; H. 37½", W. 21½". (Winterthur Museum.)

Fig. 19. Side chair, probably Delaware, 1760–80. Mahogany; H. 38 11/16", W. 23 13/16". (Winterthur Museum.) History of ownership in the Crow family, Odessa, Delaware. Armchair from same set shown in figure 20.

(pierced splat) cost an additional two shillings.[48] More ornate versions were available at still higher charges.

The precise descriptions and costs of options in the price list imply a significant level of uniformity in Philadelphia furniture making. Within each shop all of the workers understood what plain feet were to look like and how much work pierced splats required. Competition and the inevitable movement of workers from shop to shop also argue for a high degree of uniformity industry wide. The workers' common training and repeated contact with one another throughout their furniture-making careers resulted in what Charles F. Montgomery described as a "common understanding of [furniture] forms and methods of fabrication."[49] Market pressures also tended to keep furniture options within a narrow band of acceptable forms. Among individual shops any imbalance in the nature and cost of an option would have manifested itself as a competitive edge or disadvantage in the market. If, as many advertisements claimed, goods could be had "cheaper and better" from one shop, other establishments would have had to conform quickly to stay in business. Shops readily borrowed designs from each other, and in general the industry maintained a remarkably even level of quality: claw feet were claw feet, and Gothic splats were Gothic splats.

Price-list entries indicate that furniture of both the current Chippendale style and the previous Queen Anne style, plus mixtures of the two, were available throughout the Chippendale period. Side

[48] Weil, "Price Book," p. 182. This entry was misread as "with out through banister" in Gillingham's transcription of Lehman's price list (see Gillingham, "Lehman," p. 290).

[49] Montgomery, *American Furniture*, p. 16.

Fig. 20. Armchair, probably Delaware, 1760–80. Mahogany; H. 39½", W. 24⅜". (Winterthur Museum.) Side chair from same set shown in figure 19.

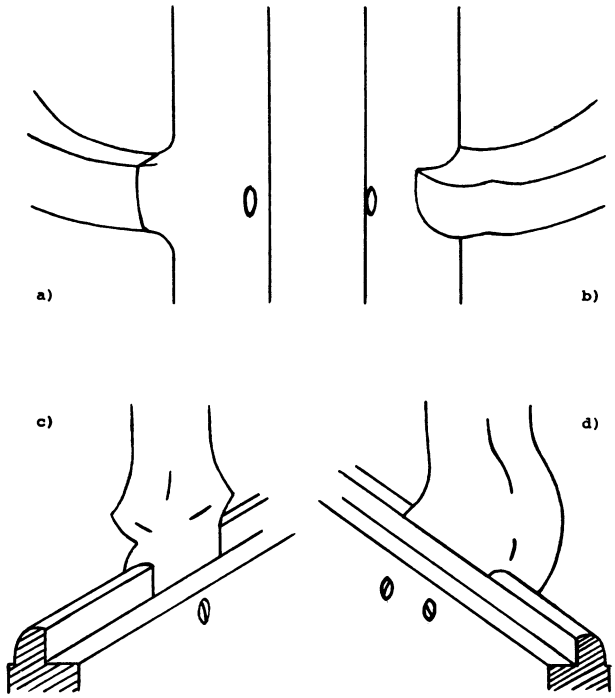

Fig. 21. Details of arm construction: *a*) arm attached to post with nodule, *b*) arm contoured to fit around post, *c*) arm support fitted into side rail, *d*) arm support contoured to fit around side rail. (Drawing, Philip D. Zimmerman.)

chairs, for example, could be purchased with stylish through-banisters and claw feet, or with Queen Anne style "plain feet and bannesters" (trifid or pad feet with solid splats). A rare set of furniture drawings made by Samuel Mickle and dated 1766 illustrates a chair combining elements of each style. Twenty-one years later, cabinetmaker Charles Ford advertised the sale of his remaining stock of furniture including "plain, claw-feet and ornamental chairs of the newest taste." In each instance, the key factor in the appearance of these chairs seems to be economics: the less elaborate chairs, suggesting the earlier style, were merely cheaper. This interpretation questions the viewpoint that chairs combining elements of two consecutive styles were "transitional." As John Kirk has observed, these chairs did not fall out of favor until the end of the Chippendale period, hence they do not represent a transition from one style to another; they are more correctly understood as "composites" (figs. 22, 23). The practice of parts substitution and standardization provides a reasonable explanation for why certain Queen Anne motifs retained their popularity well into the succeeding style period. Moreover, it can account for why these motifs finally did disappear with the widespread acceptance of the federal style by the early 1790s. Chairs of this new style differed sufficiently from Chippendale chairs in design and construction that the old patterns simply could not fit into the new form. Parts substitution was neither visually acceptable nor economically practical.[50]

In contrast to the numerous variations of composite chairs, one combination of parts may represent a true transition between the two styles (fig. 22). This form incorporates a pierced splat and claw feet with a "compass" (rounded) seat frame, crooked back, and rear-leg brackets.[51] The latest

[50] Weil, "Price Book," p. 182; Photostat, Ph18, DMMC. Original at the Philadelphia Museum of Art. Ford advertisement, September 15, 1787, Prime, *Arts and Crafts*, p. 177. Kirk, *American Chairs*, p. 7.

[51] This chair was not included in the study sample. In all likelihood, "crooked backs" referred to the curvature of the post (and splat) as seen from the side of the chair. However, it must be noted that the posts of this and other high-style examples are also crooked when seen from the front. Invariably, the inside edges of such posts were built up by gluing on additional wood.

Fig. 22. Side chair, Philadelphia, 1755–60. Walnut, H. 42⅝", W. 20⅝". (Winterthur Museum.)

feature on this type of chair is the pierced splat, which first appears in Philadelphia manuscripts in 1754, thereby establishing the earliest date of its fabrication. Claw feet, which had been a part of Philadelphia chairmakers' design vocabulary since the late 1740s, are also found on similar chairs with solid splats. Of the three remaining features—all Queen Anne details—the compass seat was often mentioned in contemporary descriptions. However, the latest manuscript reference to its purchase or use is 1761, indicating an approximate end to its popularity.[52] In addition, the rarity of

[52] Hornor, *Blue Book*, pp. 202, 194. The earliest dated piece of Philadelphia Chippendale furniture is a high chest owned by

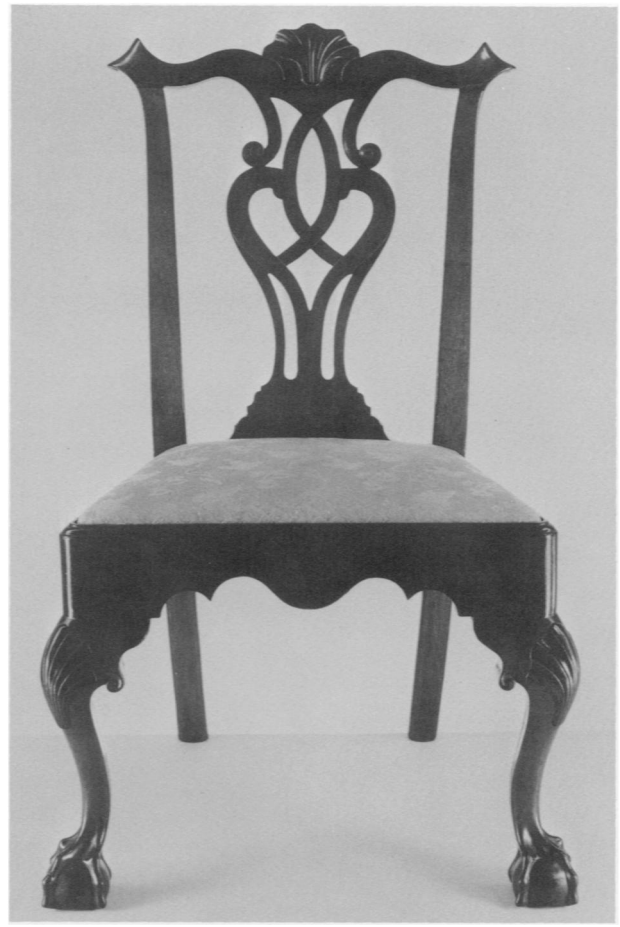

Fig. 23. Side chair, Philadelphia, 1755–60. Mahogany; H. 40⅛", W. 23½". (Winterthur Museum.)

these chairs relative to chairs of other designs strengthens the view that they were made for only a short while (although this may also point to a less popular design made over a longer time period).

An important factor in assessing stylish chairs is that they were expensive to make. Consequently, their appearance was not influenced by the cost of labor and materials to any great extent but depended instead upon the dictates of fashion. Later, as the various components of the new style became popular, these moved toward the "pure" form of the Chippendale style. This evolution is evident in a chair that has the same splat as the compass-seat

Colonial Williamsburg that is signed by Henry Cliffton and Thomas Cartaret and dated November 4(?), 1753 (1975.154). Hornor reported that claw feet were mentioned in accounts as early as January 17, 1745/6 (which he cites as 1745) and 1748 (*Blue Book*, pp. 38–39, 95). He illustrated Queen Anne chairs with claw feet in pls. 79, 80, 82, 83. His pl. 81 appears to be the same chair as my fig. 22. Estate inventories are not helpful here because they establish only ownership and do not indicate current interest in or use of the object in question.

chair (fig. 23). Together, these two chairs suggest that the Chippendale style evolved piecemeal over a number of years from its closely related predecessor rather than as a unified design that gradually gained acceptance, as the federal style did.

The observations regarding chair fabrication, along with those presented earlier in this study, point to some general conclusions pertaining to chairmaking in Philadelphia during the Chippendale period. Fabrication of these chairs did not necessarily take place over a single or continuous time period. Parts may have been made weeks, months, or possibly years ahead of the time they were used in pieces of furniture.[53] In addition to parts stockpiling, some furniture may have been produced on speculation as ready-made wares and have undergone modifications or additional finishing after a buyer had expressed interest. Chair production was fragmented further by specialists who were employed at times to complete certain phases of the work.

Fragmented production extended back beyond the workmanship stage to design. The final object was seldom the product of a single design. Rather, it grew out of a combination of individually designed parts or sections—legs, backs, crest rails, and arms—fitted together. Paralleling the practice of stockpiling parts, some of these design components may have been conceived well before others were. Consequently, good chair design often resulted from effective planning that combined given parts and new resolutions.

[53] See Benno M. Forman's study of the Fussell-Savery connection, "Delaware Valley 'Crookt Foot' and Slat-Back Chairs: The Fussell-Savery Connection," *Winterthur Portfolio* 15, no. 1 (Spring 1980): 46.