ZIMMERMAN, PHILIP DOUGLAS
THE ARTIFACT AS HISTORICAL SOURCE MATERIAL:
A COMPARATIVE STUDY OF PHILADELPHIA
CHIPPENDALE CHAIRS.

UNIVERSITY OF DELAWARE (WINTERTHUR PROGRAM),
M.A., 1980
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THE ARTIFACT AS HISTORICAL SOURCE MATERIAL:
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CHIPPENDALE CHAIRS

by
Philip D. Zimmerman

A thesis submitted to the Faculty of the University of Delaware in partial fulfillment of the requirements for the degree of Master of Arts in Early American Culture.

May, 1980
THE ARTIFACT AS HISTORICAL SOURCE MATERIAL: A COMPARATIVE STUDY OF PHILADELPHIA CHIPPENDALE CHAIRS

by

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ACKNOWLEDGMENTS

The origins of my interest in Philadelphia Chippendale furniture are difficult for me to determine. They probably lie somewhere among my first impressions of the collections at the Winterthur Museum and in my early exposure to them through teachers and lecturers. The origins of the present study, however, are easier to identify: they are to be found in many conversations that I was privileged to have with Benno M. Forman, my advisor. His encyclopedic knowledge of furniture and furniture-making and his insight into its study benefitted me greatly through his guidance and criticism. It is to him that I owe my deepest thanks.

In the course of collecting information in the field, I amassed debts to many individuals who donated their time and help unsparingly. I owe special thanks to the following: Jonathan L. Fairbanks, Museum of Fine Arts, Boston; Patricia E. Kane, Yale University; Morrison H. Heckscher, Metropolitan Museum of Art; Beatrice Garvan, Mary Graham, and Jane Claney, Philadelphia Museum of Art; Charles F. Hummel, Winterthur Museum; Horace H. Hotchkiss, Corbit-Sharpe House, Odessa, Del.; Betty Monkman, The White House; Gail Serfaty, Depart-
ment of State; Wallace Gusier and Brock Jobe, Colonial Williamsburg.

Others who helped in a variety of ways include Joe Kindig, John A. H. Sweeney, Louise L. Stevenson, John T. Kirk, Arlene M. Palmer, Robert. F. Trent, Raymond V. Shepherd, Jr., Joseph W. Hammond, Lu Bartlett, and the entire Winterthur Library staff. For their readings of portions of the text, I would also like to thank David D. Hall and Clare Dempsey. My great appreciation is due to George Kaufman, Robert L. McNeil, Jr., and Henry S. McNeil, who graciously allowed me to examine their collections during my work.

I would like to acknowledge with sincere thanks my debt to Marion S. Carson whose support and enthusiasm for my work was matched only by her boundless knowledge and intimate familiarity with Philadelphia and its decorative arts. Our many discussions covering a variety of subjects were most rewarding and enjoyable. Finally, I must remember the late Charles F. Montgomery who, as my undergraduate professor at Yale University, first exposed me to the American decorative arts. His influence, above all others, drew me into this field; for that, and especially for his friendship and continued interest in my work, I will always be grateful.
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INTRODUCTION

For decades Philadelphia Chippendale furniture has lured appreciative audiences ranging from casual admirers to serious students. It is pictured and discussed in the earliest books on American furniture, and it quickly assumed a key role in important furniture collections and exhibitions.¹ By the 1920s widespread interest in this body of objects resulted in the publication of numerous articles that recorded newly discovered furniture makers and pieces of furniture.² In 1935 William Macpherson Hornor synthesized this material with his own extensive research in the Blue Book, Philadelphia Furniture. His work at once elevated the study of Philadelphia Chippendale furniture to a level of scholarship previously unobtained and set a standard for subsequent studies.³ The scope, richness of factual detail, and insight of this book continues to provide students of furniture with a wealth of stimulating material.

In the years following the appearance of the Blue Book, new discoveries continued to be published, but at the same time, other scholars pursued different research objectives. These writers focused on the identification of
regional designs and construction traits; they charted the spread of styles from England and other parts of Europe to America, and from style centers to outlying regions within America; and they evaluated individual pieces of furniture in aesthetic terms. 4

Although the bibliography of Philadelphia Chippendale furniture is unified by its subject matter, differences in method and objectives divide this material into two categories of scholarship—antiquarian and historical. The first is characterized by an abundance of facts and detail with little emphasis on their organization into analytical or interpretive statements. This quality bears out an important objective of antiquarian research: to record (or re-record) aspects of the past. 5 The antiquarian's method, which is actually less a method than an attitude towards his material, typically includes a sense of participation in the past through its rediscovery. Evaluation of past events, an objective of the historian, is not of great concern to the antiquarian. Instead, he assigns equal significance to everything about the past. In addition, the "quest" itself sometimes assumes an important role and may be described in as much detail as the subject of the quest.

In contrast, the historical approach relies heavily upon analytical frameworks. These structures impose order
upon the data by weighting the significance of each piece of information. The search for patterns among these data requires that the historical scholar remove himself from his subject matter. With this distance, he can more clearly assess the evidence in question. He differs further from the antiquarian in the treatment of historical material: he abstracts from particular events and, by generalizing, gives his interpretation wider application.

The objectives of an historical approach to Philadelphia Chippendale furniture, and to American decorative arts in general, can be explored by suggesting an answer to the question: Why is a particular object important? Ultimately, it is important because it provides evidence for examining a culture, though this analytical step is seldom taken. In more immediate terms, however, the object's significance most often lies in its iconographical content, in its representing a particular form or an ideal in matters of style or regional expression, or in its being a key to the identification of other objects. All of these concerns reflect an interest in the object primarily as an art-form.

This parallel to art and the study of art extends into the realm of methods by which these objects are analyzed. Typically, individual pieces of furniture are set into relationships with other examples by linking visual qualities of each, and groups of related objects are formed into "schools"
whose characteristics are exemplified in the work of a "master."

This study attempts to explore other possible areas of object-investigation within the historical vein by building upon existing research in American furniture. It seeks new directions by changing a few of the prevailing modes of object-study. In particular, it examines a large body of similar objects, rather than the more usual route of selecting a few representative examples which are then analyzed in depth. Second, the objects are interpreted as the products of profit-oriented businesses in competition with one another. The study is directed more towards an examination of furniture-making procedures and the trade itself than to issues of style and form. Finally, it seeks to reduce the dependence upon subjective judgments in establishing relationships among objects by emphasizing instead simple comparisons of quantifiable, or otherwise measurable, properties of the objects.

Chairs were selected as the furniture-form to be studied for three reasons: first, they are numerous; second, their size and visible construction makes them easy to examine; third, and most important, the fact that this furniture-form was produced in such volume argues that innovations in production techniques, and possibly in style, should appear quickly, if not first, in this form.


For two brief, but insightful, statements on the differences between antiquarian and historical approaches, see George Kubler, The Shape of Time: Remarks on the History of Things (New Haven: Yale University Press, 1962), pp. 12-13; and David Hall, review of Salem, Massachusetts, 1625-
CHAPTER ONE: THE METHODOLOGY

Models for Artifact Study

Models suitable for analysis of American decorative arts objects are scarce. Among the few attempts to provide guidelines and direction in this area is E. McClung Fleming's "Artifact Study: A Proposed Model" (1974). In this essay Fleming assigns five properties to the artifact and describes four analytical steps to be carried out on one or more of the properties. The five properties embrace virtually all data that can be associated with the artifact. Data intrinsic to the object lie within the categories of material, construction, and design. Extrinsic data, or information that is derived from sources outside the physicality of the object, are classed as history or function. Various uses of these types of data are presented as one of the four operations: identification (distinctive facts), evaluation (judgments and comparisons), cultural analysis (the artifact seen within its contemporary context), and interpretation (meaning and significance in today's culture). Fleming does not recognize these operations as distinct categories. Instead, he sees them as points of reference within a single ongoing process of analysis in which each stage, beginning
Fleming's model is general and highly flexible. It is designed to "yield answers to most of the important questions we want to ask about an artifact." The model is particularly effective in showing the complexity and richness of the "content" of "non-verbal documents." It can be used successfully to provide a systematic exegesis of the object and the many facts and associations that surround it. The model is also helpful in setting the artifact within a geographical or temporal context, thus extending its usefulness beyond the confines of a single artifact.

Despite its scope and flexibility, the model is essentially centripetal—it focuses inward upon the artifact as an end-product of investigation. Questions are asked about, rather than of, an artifact. Because of this orientation, most statements derived from such artifact analysis do not have much impact upon the study of history, thus fulfilling Brooke Hindle's restricted view of the value of artifacts as historical source material: "Indeed, the objects of material culture must be used to illuminate the conventional interpretations of our history."5

Fleming's sample investigation of a seventeenth-century American court cupboard can be assessed in light of
its contribution to the study of history. An immediate result of his, or anyone else's, investigation is the proliferation of numerous specific facts. These facts describe and identify the artifact and a portion of its historical context. They note its date, markings on the object, its material, its construction, and so forth. But alone, these data are of little importance. They must be given significance through selection and arrangement.

The subsequent ordering of data in Fleming's model, a process realized in his second, third, and fourth operations, is largely guided by written history. It does not posit new or challenging interpretations; rather it follows and clarifies existing views. For example, presentation of the court cupboard as an important status symbol in its culture or as a reflection of social mobility attributed to the American experience are statements derived mostly from inventory and probate research. These characterizations are not manifest in the object alone. Only reference to mill-saw marks on some surfaces, "which predicates the existence of a sawmill in the region," supplies new information that is independent of the written record.6

The net effect of the application of Fleming's model to artifacts is certainly positive—abstract historical statements become realized in concrete, three-dimensional
evidence and are often modified and clarified to great advantage. However, in weighing the consequences of this and similar efforts, the contribution to new historical knowledge and insight is limited. The object itself remains the focus and principal beneficiary of this approach. The limitations associated with this kind of artifact analysis are imposed by the method of inquiry, not the content of the object. They exist whether, like the court cupboard, the artifact is complex and "highly charged" with cultural symbolism and significance, or whether it represents simpler non-verbal evidence of an earlier culture, such as a horn drinking vessel or a ceramic pot shard.

A second, underlying problem associated with this approach concerns the use of language (and the written word) as the medium of analysis. When an artifact is compared directly to one or many diverse cultural components—such as its physical or symbolic function, its economic value, or its aesthetic significance—language is necessary as a common medium through which both tangible and abstract entities can be examined. Through language, such extremes as a physical property of an object can be juxtaposed to an art theory or a cultural value. Beneficial as this is, the full potential of the artifact as historical source material is seldom realized because the artifact is mute, hence it assumes a passive role in determining the direction and
development of any historical discussion. Consequently, the "language" of artifact analysis must also change to enable the artifact to "speak" more effectively and so become an active contributor of substantive historical material.

An aspect of Fleming's general model illustrates the manner in which artifact-study can be reoriented to allow the artifact to form the basis of fresh historical syntheses. Fleming describes an "extension" of his model as being based on "factual comparisons of one object with others of its kind in quantifiable terms." This operation is designed to produce various artifact properties. Using his court cupboard example, Fleming describes its complexity in form and ornament relative to other seventeenth-century pieces of furniture. He also notes some implications of construction practices. Finally, he suggests possible avenues of inquiry based on chronological data. Unfortunately, Fleming does not pursue this line of investigation beyond showing where potential uses lie.

As an investigatory procedure by itself, Fleming's extension differs dramatically from the rest of his model. The single artifact is no longer the focus of study, but the focus becomes the artifact's relationship within a group of similar artifacts. Ultimately, the web of relationships among artifacts emerges as the most important aspect of the
study, thus eclipsing the significance of individual artifacts. The relationships formed by this method of inquiry establish a variety of artifact properties (common or rare, the same as, highly decorated, largest, oldest, innovative, and so forth) through comparisons, correlations, or series. They are based only on data intrinsic to the artifacts: materials, construction, design, workmanship, and later alterations. The formulation of these relationships does not depend upon historical data, functional analyses, or evaluations and interpretations, although these factors are often an important part of the overall historical investigation. At the same time, since none of the data is conceptual, the development of artifact relationships does not require that artifact properties or characteristics be articulated or translated into spoken language. The relationships are based on empirical observations, and often a simple yes/no is sufficient (which introduces the possibility of computer coding and analysis). Consequently, these preliminary findings resulting from artifact comparison ("juxtaposition" is a more exact term, but it is cumbersome) are not impeded by the non-verbal qualities of artifacts.

The individual artifact properties that are generated by comparative analysis are not sufficient by themselves to provide an adequate basis for historical interpretation. As simple statements of fact, they carry no particular signifi-
cance. However, when considered as a group of related facts (since they come from a body of related artifacts), these data can combine to form an index whereby various aspects of a culture can be measured.

When the properties of a group of similar artifacts are compared with one another, many differences among the separate artifacts emerge. Assuming these differences are not random changes, they indicate a response of the artifact-maker to some changing or changed external condition. Each artifact represents a single response, but the factors that contribute to that response are numerous. Traditional patterns of behavior mingled with social and economic conditions influence the matter and form of the artifact. More ephemeral considerations of taste or unacademic efforts to convey some sense of visual delight are also important determinants. Finally, a variety of other particular circumstances may be responsible for changes among the artifacts within a group.

By establishing some kind of link between artifact differences and one or more aspects of the cultural that produced them, the artifacts can be used to explore that cultural dimension. They then become historical source material, independent of written history. The procedure behind identifying and using such a connection has been outlined by Henry Glassie in Folk Housing in Middle Virginia (1975). He recorded differences in form among examples of
a generic house-form in two Virginia counties. From these initially unordered data, he identified various patterns that traced these changes. He subjected these patterns to a "continual process of abstraction and synthesis . . . not to eliminate information, but rather to generalize it." He then hypothesized a set of rules that would account for these patterns "in the simplest possible manner." Extrapolating somewhat from Glassie's more technical use of the term, the rules represent the link between the artifact and its culture, or more specifically, between form and use. Since the causal relationship from cultural circumstances to artifact change is given a priori, in essence these rules serve to put the relationship into a language-form allowing the artifact to be "read."

Information gained from this structural analysis of artifacts can be integrated with conventional historical source material, or it may be rich enough to stand on its own. Regardless, it may be interpreted to serve a variety of research objectives. Glassie, for example, advanced a set of historical statements concerning notions of privacy and individualism in the eighteenth and nineteenth centuries. Specifically, he discussed these concepts as they applied to a group of people (the house-owners) whose daily lives and values were not represented in written records. Using his structuralist approach, Glassie recovered otherwise unobtain-
able historical source material through artifact analysis. His convincing presentation of non-verbal data marks one of the most significant contributions of his study.

Objectives other than social history can also be achieved through structural analysis of artifacts. Robert F. Trent applied this technique to a group of coastal Connecticut turned chairs in order to examine certain art historical theories and concepts. Though advancing only a "token structural analysis . . . in emulation of Glassie's," Trent used his findings to dispute the notion that "folk art is a degenerate or at least garbled version of high-style forms." He also argued that the "artificial systems of compositional logic" that he found in these simple chair-forms contributed to making them proper objects of aesthetic study.

The similarity between Trent's and Glassie's models extends beyond the use of the same basic structuralist formula (artifact differences-patterns-rules-interpretation). Both models agree in the critical area of formulating guidelines or approaches for patterning the differences among the artifacts. Most artifacts are sufficiently complex that these differences are legion. If all intrinsic properties were listed, the accumulated data would be unwieldy, if not simply impossible to manage. In addition, many of these individual data points, all potential areas of comparison,
may be redundant or inconsequential in the context of the aims of a particular study. Thus, a strategy or "theory of inquiry" is necessary to relieve this congestion of data. This initial focus identifies which properties among all of those possible will be selected for study, and in shaping the data pool, it influences how they will be studied.\textsuperscript{14}

The strategies underlying Trent's and Glassie's studies posit the analysis of form as an essential organizing factor. The fundamental structure of the artifact and all related modifications are described using a base or modular unit. The resulting formalistic relationships between the base unit and the individual objects are then analyzed to yield a number of results: the arrangement of the artifacts into a series, the degree of variation from a norm, or the exploration of ideas such as style drift and the persistence of certain forms over time, to name a few. Finally, these results may be interpreted as evidence of cultural conditions or change.

While a formalistic approach to ordering raw data may produce interesting and valuable results, dependence upon form is not the only strategy available with which to investigate artifacts. Among other possibilities is a strategy based on action (or behavior). Here, the base or modular unit is replaced by a process of making, or "workmanship,"
as defined by David Pye in *The Nature and Art of Workmanship*.¹⁵ As a strategy, workmanship functions in the same way as does form in the formalistic approach—to shape the selection and arrangement of artifact data. However, even though objectives of each type of analysis may remain the same, this change in strategy alters the means by which conclusions are formed. This shift is best explained by reference to Glassie’s and Trent’s studies.

Glassie developed his model in terms of "competence" and "context" and "performance." Competence, he suggested, is the internalized ability of an idealized maker to design an artifact. Context enters into the design stage as a dialectic; it seeks to establish a relationship between the internalized artifact-design and external conditions. Glassie stressed that these two abstract components occur simultaneously as a single act of conceptualizing. The result of competence and context is performance: "the product that can be observed by the scholar."¹⁶ It is unclear whether Glassie understands performance as the actual process of artifact-making (i.e., workmanship), or as an abstract synthesis of competence and context with artifact-making being recognized as a non-conceptual, rather automated technique or expression of technology.¹⁷ "Either way, the addition of performance extends the model a step closer to the actual artifact. The former case is a three-factor model comprised
of design (competence and context), workmanship or fabrication (performance), and artifact. In the latter, conceptualization occurs in two stages (ending with performance) and is followed by workmanship (technique) and artifact.

Regardless of how the model is constructed, only the end-product, the artifact, can be examined by the historian. From the artifact he may project back to either the workmanship stage or beyond it to the design stage, each of which provides material that may be mined for patterns and rules. David Pye's work is useful again in differentiating between these two phases of artifact-making. He describes each activity concisely: "design proposes, workmanship disposes." For him, these two phases do not necessarily reside in the same individual (a designer, for example, may pass on instructions to a worker). This difference from Glassie's conception of a folk designer/maker is not crucial, but it does emphasize the mutual independence of the two stages. Pye states further that the transformation from design to tangible artifact is influenced by the quality of workmanship: "good workmanship" implements the design accurately; "bad workmanship" does not. Thus, depending upon the quality of workmanship, an artifact may or may not fully represent the designer's intention or the competence of the idealized maker.
Bad workmanship is visible as a deviation of the finished artifact from an idealized form (established through patterning and rule-making). However, other artifacts may also differ, yet be products of good workmanship. In these examples the design itself has undergone innovation or modification, and the worker has accurately reproduced it. Thus, some artifacts must be classified as sub-types of the idealized form, while others simply do not fit within the artifact system. In an artifact system based on an examination of design, the distinctions between these two kinds of artifacts are somewhat arbitrary: an investigator may include one deviant form as a sub-type while another may consider it a "misstatement" and therefore inappropriate for study. Artifact systems that incorporate many deviant forms as sub-types tend to be more complex than those that reject a greater number of irregular forms as misstatements.

Some uncertainties that stem from selecting for study artifacts of suitable form can be avoided by focusing on workmanship rather than design. When the design stage is ignored, the problem of recognizing good or bad workmanship simply disappears. Considered only as a product of the process of making, the artifact needs no further qualifications regarding its intended form.

Examination of workmanship in artifacts requires a
change in strategy from one based on form to one that reflects action. Patterning is still accomplished by observing consistencies throughout the body of artifacts, but the index by which consistancy is measured is a way of doing something rather than a formalistic value such as a square or line segment. The rule-making stage that describes these consistencies varies according to the strategy employed. Consequently, the rules accounting for the design of an artifact may not coincide with rules explaining the process of making that same artifact. Likewise, the interpretive use of these rules may address quite different questions.

Despite typically divergent paths of analysis, the two approaches interact in a noteworthy manner. Traditional techniques or ways of doing something, which normally lie within the domain of analyzing workmanship instead of design, may be so strong that they form an essential component of the idealized design of the artifact. Thus, a study of the design stage of artifact-making may incorporate action. This crossover between the two approaches is also apparent in searching for a "compositional logic" of an artifact. The artifact's logic may be established by and expressed in terms of its design or its fabrication. Reference to Robert Trent's analysis of a turned chair helps illuminate this
Trent identified a compositional logic embodied in the form of his group of turned chairs. He selected a representative chair and listed numerous measurements of its various design elements. After analyzing these data, he concluded that the chairmaker developed his design based on an arbitrarily selected linear measurement that became a constant value in the overall plan. Trent then described all of the measurements of the chair as a function of this unit. To obtain some of these measurements, the base unit had to be divided into six parts, and it had to form the leg of a right triangle whose hypotenuse became yet another measurement. Still more significant measurements were obtained by adding a two-inch value cumulatively. Trent describes the resulting complex system in terms of harmonics and scansion21 (see Fig. 1).

Alternatively, the problem of how a chairmaker developed a particular design can be approached using workmanship as a strategy. A simple action replaces a specific measurement as the base unit of the inquiry. With reference to Trent's example, the action is that of doubling (or halving) a measurement. Trent's data can be reordered to reflect this different approach: the data show that the length of the rear posts is twice that of the front legs,
Figure 1

Line drawing of a turned side chair showing measurements in inches. (Re-drawn from Robert F. Trent, Hearts and Crowns, Diagrams B and E, pp. 26-27.)
Figure 2

Line drawing of a turned side chair showing measurements as doubled and halved values of an arbitrary length.
stretchers, and seat list; the side and rear stretchers and seat lists are three-quarters of the length of the front members. Together, all of these elements create the basic form of the chair. The remaining structural details—the size and placement of the slats and the positioning of the stretchers—may be resolved through a combination of rote practices (setting the seat list an inch and one half from the top of the leg) and simple arithmetic progressions (increasing a given measurement by one inch), in addition to doubling. The important distinction here is that there is no conscious (or subconscious) blending of these separate operations into a single, complex system that accounts for the form of the entire artifact. Of course this viewpoint does not exclude the possibility of the other, but it is a complete explanation without discovering a conceptual unity (see Fig. 2).

The fact that the organization of this particular chair can be explained through a workmanship strategy does not necessarily refute an analysis based on a formalistic approach. Neither investigation can offer "proof" (as in mathematics, for example); each can only suggest a line of reasoning. One of the tenets by which these differing viewpoints can be assessed recalls Glassie's criterion that things be explained in the simplest manner possible. Thus, while a maker of turned chairs may have known how to divide
a line into six equal parts using a pair of compasses and a straightedge, more likely he used these tools to double or halve a given measurement when he needed to resolve a design problem. Similarly, it probably did not occur to him (nor did it lay somewhere in his subconscious) to construct a right triangle in order to use its hypothesis as a design element. This particular measurement, the seat depth, is important as a factor of design only; it is not an actual chair-part. In all likelihood, its length was merely a consequence of the real chair-parts that formed the seat.22

In short, the workmanship viewpoint developed here suggests that when the artifact-maker is confronted with a problem, he attempts to solve it by drawing on a language of action developed through years of doing, rather than looking to a vocabulary of forms developed through seeing.

The Workmanship Model: Theory

A decision to use a structuralist model for the study of objects brings with it much of the basic scope and direction of an investigation. Since the structuralist approach is essentially a comparative technique, the data pool must include a relatively large number of objects (or points of comparison). Moreover, these objects must be sufficiently similar so that the differences among them will be specific enough to provide evidence for an interpretation
of some depth and significance.

The structuralist formula also imposes a general procedure, but many possibilities lie within its boundaries. They reflect a wide spectrum of choice concerning the kinds of artifacts used, the types of data retrieved from these artifacts, how the data will be used, and what objectives are to be pursued. Much of the selection from among these possibilities is tied to the identification of a specific strategy. However, it is probably misleading to say that a strategy determines the choice of many of these options. Instead, the theoretical system of inquiry gives direction to the early stages of data selection and use, which then serve to refocus the theory of inquiry. A usable strategy eventually emerges from the interaction between ideas and tangible evidence.

Pye examines the tangible properties of workmanship and finds that workmanship can be divided into two categories which he calls workmanship of risk and workmanship of certainty. He describes the former as work in which "the quality of the result is continually at risk during the process of making." The carving of an elaborate finial is a good example: at any time a slip of the carving tool may spoil the entire piece of work. Workmanship of certainty, on the other hand, refers to workmanship whose quality "is
exactly predetermined.24 Its quality is controlled with a high degree of regularity by a mold, by a tool engineered for a particular result (like a molding plane), or by a stencil or a template. The workmanship of a pewterer typically is workmanship of certainty. The quality of his work is due in large measure to the pre-established level of quality that is imparted by his molds (which are themselves products of workmanship of risk).

While workmanship of risk suggests a fresh undertaking with each piece of work, workmanship of certainty implies the need to produce a large number of identical products. Furthermore, it often requires a rather substantial investment of capital in the quality-regulating tool. A set of pewter molds or a nineteenth-century copier lathe represent appreciable amounts of stored capital relative to the cost of each item produced. However, regulating tools need not always be expensive. Wooden furniture templates and "strike poles" (pattern sticks used in turning) perform the same function of transmitting strict regularity to a number of objects undergoing some stage of fabrication, and their cost to the user is slight.

Benno Forman has suggested the need for a third category of workmanship.25 (Pye also seems to have recognized the need for another category. He introduced a con-
cept of workmanship of limited risk, but did not define it adequately nor pursue its ramifications. This third category, which is perhaps best identified as workmanship of habit, accounts for artifacts that exhibit a remarkable degree of regularity in their workmanship, though each by itself fits a strict definition of workmanship of risk. Turnings on seventeenth- and eighteenth-century furniture offer good examples of this type of workmanship. Repeated patterns of engraved ornament on silver objects, or hand-cut decoration on early glass also show notable consistancy, approaching certainty, in work that is actually subject to ruin at any time since no template, jig, or other guiding instrument controls the worker's 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. 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 to his particular task. This kind of workmanship depends upon the need to repeat the same skill or procedure over and over again. An example of this repetition can be seen in the turner who may turn hundreds of stretchers or lists in a matter of days and weeks. Likewise, a carver may make the same type of claw foot so often that there is virtually no differences among his hand-made
products. Certain construction techniques may also be recognized as workmanship of habit.

Each example of workmanship of habit shows a highly patterned and predictable response to a particular problem, either in design or structure, faced by the worker. Workmanship of habit contrasts with workmanship of certainty in that the former offers the worker the opportunity to alter his treatment of the piece of work; molds, jigs, and other regulating tools offer no choice regarding the form and quality of the output. Workmanship of risk, on the other hand, is a first-time (and perhaps final) resolution. While the worker is apt to select components of this resolution from a rich and accomplished artisan-background, thus ensuring a resemblance to previous work, the overall arrangement or consequence of the work in question does not benefit directly from past experience, but represents a fresh undertaking.

An informal survey of examples of workmanship of habit reveals that usually an individual solution is only one among many possibilities. Variations from individual-to-individual, shop-to-shop, and region-to-region in chair splat designs, in the plan of carved ornament, and in drawer construction account for just a few of the range of options available to and decisions reached by artisans. Once
resolved, the persistent reuse of these solutions evident in many examples of workmanship of habit suggests that these resolutions continued to serve the artisan adequately over a period of time. Eventually, however, other forces must have altered the original problem, thereby making a new solution necessary. Changes in the economic climate, in industry practices and technology, and in matters of taste certainly contributed to the need for new solutions. The widespread introduction of the dovetail in American furniture-making about the turn of the eighteenth century, or the stylistic shift from turned legs to carved legs in the late 1720s illustrate but two of the countless changes that took place constantly.

Unlike workmanship of risk and workmanship of certainty, which are easily identifiable in today's work environment, the widespread use of workmanship of habit appears to be tied to specific historical conditions that no longer prevail. Relatively scarce capital in eighteenth-century America stalled investment in expensive mechanized tools and in other means of quality-regulation that now account for most workmanship of certainty. Instead, whatever capital could be amassed typically went into commerce or land. The few ventures into more capital-intensive manufacturing rarely generated satisfactory returns on investment, nor was cash flow sufficient. These undertakings
often failed, sometimes on a very large scale, despite public support in the form of tax relief, monopoly interests, and occasional infusions of public funds. Relatively small markets for many manufactured goods also retarded the growth of more highly mechanized production methods, and lower output meant reduced economies of scale. In summary, then, the repetitive use of hand skills—manifesting itself as workmanship of habit—can be seen as a workable, though not necessarily optimal, means of production given those circumstances.

Dramatic changes in the early nineteenth century gave rise to parallel changes in the manufacture of goods. At the same time, the establishment of a domestic capital market enabled manufacturers to acquire the capital funds needed for investment in new, more sophisticated equipment and in technological research. The result was a much higher level of output, which also added variety to the increased availability of goods to the consumer. A specific example afforded by cheap, functional side chairs illustrates this change: in the eighteenth and early nineteenth centuries they were the ubiquitous turned products of workmanship of habit; later they were factory-made chairs marketed through catalogues in a number of different "styles," and all products of sophisticated woodworking tools and other means of workmanship of certainty.
The link between workmanship of habit and pre-industrial conditions coupled with the subsequent decline in the use of this kind of workmanship has little effect upon its current value as a tool for investigating historical problems. When it is combined with the concepts of workmanship of certainty and workmanship of risk, a clear strategy can be established through which objects may be investigated.

The vocabulary of workmanship can be applied to objects to yield a simple interpretive framework. Workmanship of certainty presupposes the existence of a quality-regulating tool used during the process of making. If the same workmanship of certainty is evident among a number of artifacts, then the same quality-regulating tool, or identical tools, must have been used to fabricate the component or property that is the same among the artifacts. Extrapolating further, if identical tools are unlikely to occur for one reason or another, then the identification of the same workmanship of certainty establishes a real (i.e., observable) common denominator among the artifacts. Indeed, this relationship can be stated in unequivocal terms: a single tool, which may or may not survive today, was used by a worker to produce that particular piece of work in all of the artifacts in which the work occurs.

Numerous examples of work may be compared to the
original regulating tool or a reconstruction of it to establish these relationships. Molding profiles can be determined by a mold rule that reproduces the cutting profile of the tool used to cut the molding originally. Objects cast from the same mold can be identified by noting mold characteristics and defects. 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 there is a common origin for all of the objects.

The accuracy of these relationships depends upon two critical factors: the technique by which particular pieces of worked are judged to be examples of the same workmanship of certainty, and the basis for postulating that only one tool could have been used to produce all of the work. To begin, a number of tolerances must be established for measuring purposes. These guidelines vary among different types of objects according to materials, form, and method of fabrication. For example, diameters of thirteen-inch pewter plates cast from the same mold may differ by as much as one-quarter inch because of varying rates of shrinkage as the metal cooled and hardened. Wood shrinkage and wear and tear may decrease some dimensions from their original size as time passes. Some tolerances must be increased because of degrees of variance allowed the worker when he
made the piece of work. Saw-cuts, filing, and finishing all change a template outline somewhat; and it may be altered by tracing it with a scribe if the angle of the scribe to the template is not kept constant.

By the same token, the whole basis for relating objects by examining workmanship can be destroyed easily if tolerances are too lax. Determination of satisfactory tolerances probably is resolved best by testing for "typical" degrees of variation in a given product of workmanship of certainty. These tests may take the form of recreating the work in process (as in casting new pewter plates) or sampling known objects. Obviously, if results from neither test prove reliable, then any relationship among objects based on the piece of work in question must await further confirmation through other means.

Once an adequate technique for equating individual examples of workmanship of certainty has been established, the problem remains to determine the number of quality-regulating tools used to make each example within a body of related work. Two situations may arise to cause more than a single tool to have been used to create the body of work: identical quality-regulating tools may have been used, or tolerances associated with two or more examples of workmanship of certainty may overlap causing their respective
products to appear to be from the same tool. This latter situation occurs most often when simple examples of work are examined. When, for example, a two-inch long ogee molding is compared with another of the same length, variations in wear on the cutting edge of the plane or in the manner in which the tool was used may produce different results in work from that tool; alternatively, it may make the work from a different tool look the same. When these uncertainties arise, support from other sources may be required to establish a convincing relationship among objects.

In the absence of evidence to the contrary, the recurrence of identical quality-regulating tools is rare, perhaps unknown, before the early-to-mid nineteenth century. Such tools presuppose manufacture by workmanship of certainty, thus requiring a quality-regulating tool for mass producing tools. Some ready-made tools were available in America by the late eighteenth century, but they were simple hand-tools like gouges, augers, chisels, and planes (often with blank cutting edges to be shaped by the user). Work produced with these tools is too simple to allow identification of specific, regulated patterns of workmanship.

The contrast between examples of workmanship of certainty and that of risk is complete. Where one is
repetitive and predictable, the other is not. The former can be measured against an objective index (the quality-regulating tool itself or some accurate substitute), but workmanship of risk can only be evaluated subjectively. By its definition, workmanship of risk has no intrinsic property that can be equated to that in another piece of work, though this does not preclude the existence of relationships of other kinds. The occasional similarities, perhaps approaching identity, that may occur must be considered accidental since they lack the essential ingredient of regulation. Thus, workmanship of risk cannot provide the basis for establishing common denominators or patterns among objects.

Regulation in work other than that imposed by tools constitutes the in-between category of workmanship of habit. When the three categories of workmanship are set in this order, workmanship of habit clearly embraces a broad range of action between the two well-defined poles. The relative placement of an example of workmanship between certainty and risk is determined by the strength of the habit which, in turn, is a function of predictability. Predictability manifests itself in two ways: the recurrence of a precise type of work given the same circumstances (will the worker resolve a particular problem the same way each time?), and the degree to which repeated pieces of hand-work are uniform.
(how regulative is the worker's mental template for doing a specific piece of work?). In practice, the strength of the habit often cannot be assessed exactly. Instead, these variations in degree must be described using supportive historical evidence and simple empirical samplings that test the assessment among surviving objects. Rough as these relationships based on habit may seem, they may become compelling if few or no exceptions can be discovered. Often the data pool is so limited that this condition can be satisfied without much difficulty.

The workmanship framework, which at this stage remains general, can be applied to the study of any kinds of objects. When combined with a specific historical context and with stated objectives, the framework becomes part of an overall strategy. To begin to read the data, each category of workmanship must be tailored to fit certain needs. The outcome of this step is a set of mechanical or technical operations to be performed on the group of objects. Various patterns reflecting similarities and differences within the data pool result from these operations, and they form the bases of interpretations and conclusions.
The Workmanship Model: Application

The furniture-making industry of eighteenth-century Philadelphia has yet to be described comprehensively. Writers on the furniture of this time and place most often focus upon the problems of design and style, the circumstances and contributions of important individuals, or the characteristics of specific schools. Within the context of these and other concerns, the role of the shop as an organized unit for the production of goods is given only passing reference. Celebrated artisans are described as, or at least assumed to be, masters of shops who employ journeymen and who train apprentices. They drift in and out of partnerships with each other, and they fit within a web of economic relationships with other craftsmen and patrons. Yet somehow through all of this turmoil of activity, it is argued, products from their shops still retain and reveal their individual "hands."

The means by which the shop-owner exerted his influence and "touch" throughout every aspect of shop production has not been examined closely and remains a weak link in efforts to attribute the fabrication of furniture to certain individuals. The shop-owner was but one of a number of workers, and furniture from his shop was likely to have been made by someone other than himself, or at least
in concert with others. Therefore, without a clear delineation of responsibilities and duties among these many workers, the problem remains of determining who actually did what on pieces of documented furniture. To overcome this deficiency in identification, evidence is needed to show that some distinctive component or property of a particular furniture-form lay within the solitary domain of a single artisan. (Of course this restriction must be effective industry-wide to avoid duplications of a form from one shop to another.) For example, proportion might be cited as an appropriate "signature" of a maker if evidence showed that he characteristically and conscientiously determined this property in furniture he helped make. Likewise, aspects of the design and workmanship of a chair-back or any other component might also serve to identify an individual's work. Unfortunately, the groundwork for this treatment of the objects has not been adequately laid. Critical shortcomings exist not only in knowledge about the role of individual workers within a shop, but in reliably identified examples of their work. Most labeled and otherwise documented furniture simply recalls the need to discover how much of the object the seller actually made.\(^{38}\)

An alternative approach to understanding Philadelphia Chippendale furniture is to consider it as the product of shops, rather than of individuals. Underlying this view-
point is the assumption that the master or shop-owner implemented certain procedures that were followed by all of the workers within his shop. Established procedures allowed fewer opportunities for individual expression among the artisan-employees, but they helped maintain a desired level of quality in the output of the shop and probably increased the efficiency of the shop. Both of these factors contributed to a chief concern of the shop-owner—making money. This ambition may be lost when furniture is considered as art. When the status of its makers is raised from artisan to artist, and premiums are put on the value of individual ability and expression, time-saving techniques and other cost-cutting measures may seem to be of little consequence, and their effect upon the finished product may be lost.

When Philadelphia Chippendale chairs are considered as the products of a shop organized under the auspices of an entrepreneur, the workmanship vocabulary can be adapted easily to form an examination procedure. Workmanship of certainty is realized in the use of templates and other patterning tools on a shop-wide basis. As in standardized design and construction practices, templates impose and control the quality level of a piece of work. They also represent a cost-savings to the shop-owner in two ways: first, time is spent laying out the design only once, no
matter how many times the design is used; second, a relatively unskilled worker can use templates without a loss of quality in the piece of work, which allows the shop-owner to assign more skilled (and costlier) workers to other tasks.

In 1935 William Hornor noted that "during the last half of the eighteenth century . . . templates [sic] and printed designs [design books] were so relied upon that they contributed ultimately to the standardization of the trade." In addition to the economic reasons supporting the use of templates, written evidence survives to substantiate their use. Hornor cited a "sett of Joiners patterns" belonging to Josiah Elfreth and Joseph Clark, whose partnership ended in 1786; and "1 ps parchment & Chair patterns" were listed in John Janvier's 1801 estate inventory along with "sundry patterns." Some actual templates survive from the period, such as those in the tool collection of the Dominys of Long Island, though none from the Philadelphia region are known. 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. Made of thin pieces of wood or of paper, they were quickly discarded if they were damaged or when styles, and later when techniques, changed.

The term "patterns" referred to at least three different things in the eighteenth century. It signified the
full-sized, stencil-like outlines that functioned as jigs when marking or cutting wood or other materials. Second, carved pieces of wood used to make impressions in sand for iron-casting were also called patterns, usually prefaced by the purpose of the cast parts, such as stove or andiron patterns. The third use of the word referred to paper drawings made to scale that were passed from one party to another to convey a design accurately. About 1710, for example, the London Joyners Company complained that "Patterns and Models of all sorts of Cabinet Goods" were being sent to the East Indies where they were copied and the finished goods traded to the disadvantage of English cabinetmakers. In 1762 Ebenezer Call of Philadelphia sent "pattons for Chair Bodys" to his brother in Boston to have made into sets if "resenable terms" could be arranged. For purposes of this study, wooden jigs are identified as templates and are distinguished from paper and carved patterns.

No illustrations or written descriptions survive that record the actual use of templates in making chairs or other pieces of furniture. Nevertheless, an examination of surviving chairs shows conclusively that templates were used. Eighteenth-century templates for pierced chair-backs (splats), that have since been lost or destroyed, can be recreated accurately by tracing the outline of the splat onto a transparent sheet laid directly on it. So many
possible variations exist within any one splat design that if a single recreated template fits two or more chairs, then it must represent the eighteenth-century template that was used to make all of the matching parts. Differences are detectable as the relative location of each "strap" or other motif comprising the overall splat design. Variations of as little as one-eighth inch in their placement can be recognized when templates are compared. Similarly, the thickness or width of each element may differ, or the degree of taper along its length. When these three areas of comparison are multiplied by the number of places where they can be evaluated on any one splat, the resulting number of comparative points is enormous. Consequently, the odds against finding two independently fabricated splats having identical splat outlines are simply overwhelming. Comparisons show that two chair splats that appear to be identical are not always the same. Conversely, splats may prove to have been made from the same template even though they look unlike each other because of different surface treatment.

The procedure used in this study to recover eighteenth-century templates was a simple manual operation using common materials. Transparent acetate "sheet protectors" were first cut in half along their folded seam, then rejoined using cellophane tape to form a single-thickness "T" shape that allowed the acetate to cover the entire chair-back.
The clear sheet was laid on the front surface of the splat since the side edges (created by the thickness of the wood) were commonly tapered toward the back. This additional work effectively destroyed the certainty of the outline on the back surface because the angle of taper was not controlled, except by the habit of the worker. (The purpose of this taper undoubtedly was to create a sharper visual image along the front edges of the splat, which were often embellished further with carved beads or other work.) The acetate sheet was placed against the projecting shoe (the element into which the bottom of the splat is fitted). The top of the sheet fell on or above the crest rail (securing the top of the splat and joined to each rear post) depending upon the height of the chair-back. The outline of the splat was clarified further when viewed through the acetate by setting a white background material behind it. The outline was then carefully drawn on the acetate. No corrections for parallax or other distortions were necessary since the acetate lay directly on the edge. Each template was then marked with the accession number of the chair.

Templates were also reconstructed for crest rails, shoes, and front leg brackets using the same materials and a similar procedure. The acetate sheets were joined end-to-end to accommodate the length of the crest rail, and the outlines of each chair-part were traced as before. However,
difficulties arose in recreating satisfactory templates for these parts. Whereas splats have numerous edges and much variety in their design, the outlines of these parts are comparatively simple and repetitive from one chair to the next. Consequently, the reuse of templates in the fabrication of these parts could not be established with any degree of reliability. The amount of shaping done to the crest rail and brackets after they were cut out from board stock compounded the problem. The ears of the crest rail, an especially distinctive feature, could not be traced accurately because they do not have a sharp edge on the front surface in most instances. Unlike the middle portion of the crest rail, which is planar and yields a clear outline, the ears are rounded, making the reconstruction of that part of the template approximate. Brackets are shaped to follow the contours of the legs, a step that likewise obscures a clear template outline. Because of these limitations—the simplicity of the parts and the fact that two of them were shaped after being sawed out—matching templates for these parts were considered insufficient by themselves to establish meaningful relationships among chairs based on the reuse of templates. Regardless, identities among these parts should not be ignored since they offer support to relationships established through other means.

Evidence of workmanship of habit in Philadelphia
Chippendale chairs is abundant. As a predictable choice or way of doing things, this kind of workmanship is found in both the appearance (design) and construction of these, and other, objects. Selection of motifs, their arrangement, and their execution (identified in terms of measured proportion and distinctive forms) number among the factors contributing to appearance. Construction includes such variables as dimensions (especially measurements of seat rails and other stock), use of certain materials (which may also contribute to appearance), and construction sequences—placement of nails and pegs, types of joints, incidental finishing processes, and so forth. Since these particular properties were not brought about by means of a quality-regulating tool, they do not need to be determined or recorded by a full-sized tool or facsimile as with splat templates. Instead, they can be observed, then described verbally.

From the raw workmanship-of-habit data, various frequencies and sequencies may emerge. These patterns form the basis for advancing rules describing the predictable practices and behavior characteristic of habitual workmanship. This brief procedural outline makes apparent the need to collect considerably more data than will probably prove useful. Patterns may arise in unexpected areas or fail to exist in others thought to be strong possibilities.
Historical data from other sources (primarily written) may contradict rules derived from these patterns. In such cases, either the patterns or the other historical data must be examined more closely to determine the possibility of error. Results of object examination may truly contradict written history. On the other hand, patterns, though real in a statistical or mathematical sense, may not always reflect an actual historical choice—they may correctly record historical events that accidentally occurred in 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 need to record a large amount of information pertaining to each chair seemed best satisfied by using a worksheet for each object. Worksheets impose organization (and a built-in checklist to ensure thoroughness) upon data-collection, and they facilitate comparisons of any particular properties among any number of objects. Moreover, they can be devised to meet almost any study requirements; they are inexpensive (the cost of duplicating); and a certain amount of flexibility can be planned into the format from the outset. This latter feature is important, especially when considering new theories or methods. Often, superfluities and omissions appear in the early stages of a
study. In such instances, tightly organized data-recording systems may require a revamped system, which is time-consuming and possibly expensive. These factors may tend to discourage experimentation or consideration of data thought to be of marginal value in the beginning phases of study.

The worksheet devised for the study of Philadelphia Chippendale chairs was typed on standard-sized paper, then duplicated as needed. Information recorded on each sheet included both general cataloguing facts and data pertinent to the comparative study. The clerical section recorded the object's present owner (and accession number), location, and references to published catalogues. The remainder of each sheet provided space for detailed descriptions of many components of each chair. All of these features were identified by both verbal descriptions and by measurements (or frequencies) in inches. This unit of measure was chosen over metric units on the assumption that if sequences did exist, they would be easier to spot in the standard used by the makers. Measurements were taken with a tape and recorded to the nearest one-eighth inch at the maximum point. Greater accuracy seemed unwarranted because differing rates of shrinkage and wear introduced some degree of uncertainty. Where the contours of a chair-part made an accurate measurement difficult, such as a bracket or the width of the crest rail (identified as height on the worksheet), a pair of
compasses was used to gauge the distance. Some measurements were not deemed productive for this study and were left out. For example, the length of the front and back legs was omitted because wear on the bottom of the feet was not constant among all of the chairs. The overall height of each object was not recorded for the same reason. (For further discussion, see Appendix B.)

The verbal descriptions of each component were limited to objective or quantifiable attributes. They cite the existence of or lack of a variety of design variations, decorative details, and construction techniques. The type of foot or banister, the sequence of elements that comprised a molding profile, and the pattern of pins securing the seat rails to the legs reflect the kind of information noted in these descriptions. No assessments of quality were made. Thus, descriptions of such features as carving were restricted to its location, the type of motif used, and whether the carving was relief or incised.

Early in the study the need to add more categories to the worksheet became apparent. The worksheets were not altered; instead, the data were inserted into unused space. Placement of this information on each worksheet was consistent from one to the next. Some of the important additions to the original format were: expansion of the pattern of
of pinning the front rail to include the side and rear rails, construction of the inside of the rear rail, and numerous small variations in construction. When necessary, objects were re-examined to obtain this additional information. Finally, repetitions of various features and components among the chairs were cross-referenced as they came to light, and any other information that seemed to be of use was recorded, usually on the back of the worksheet.

The basis for identifying chairs as candidates for study was simple, and it relied heavily upon existing scholarship. The overriding factor in selecting chairs by style was the presence of a pierced splat and a crest rail with projecting ears. Front legs were either "crooked" (that is, 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 which strengthened the front corners of the chair-frame. The absence of one or two of these attributes did not necessarily preclude an object from study. Finally, urban Philadelphia products were not differentiated from those of the surrounding towns and hinterlands.

The total number of chairs to be studied was not
Figure 3

Acetate templates of splat, crest rail, shoe, and leg bracket. (Drawn from Winterthur Museum, 58.2258.)
determined at the beginning. Likewise, specific objectives of this comparative study were not set. Guidance in both of these areas came from the immediate need to test and otherwise explore the proposed model. Central to the craftsmanship framework was the supposition that 1) Philadelphia Chippendale chairs were identifiable as products of shops and not as the work of individuals, and 2) the use of templates in making their splats allowed them to be examined and subsequently patterned or catalogued by objective means. This preliminary investigation would determine how clearly and at what frequency various types of patterns might emerge from a given group of objects. These results could then be used either to alter the existing model and so improve its performance or to give direction to its continued use.

Chairs having a particular splat design were examined first in order to investigate the soundness of the theory and technique employed in the model. Acetate templates were drawn and worksheets filled out for over fifteen different chairs with "strapwork" splats (Fig. 3) before a repetition in the use of a single template occurred. No significant patterns could be recognized among any of the other points of comparison until this time either. However, this first duplication (discussed in detail below) was important for a number of reasons. Foremost among them, it supported empirically the hypothesis that suggested the use
of templates in eighteenth-century chairmaking. Moreover, it demonstrated the feasibility of establishing patterns and advancing relationships among objects based on the concept of workmanship of certainty. The two chairs related to each other in this initial breakthrough subsequently confirmed the usefulness of workmanship of habit, too, in pursuing such relationships.

In addition to supporting the proposed model, the preliminary investigation of strapwork chairs helped to shape the size and scope of the entire object study-group. The low frequency (at least relative to original expectations) of chair-part duplications evidenced by the initial round of comparison pointed out the need for a fairly large sampling of objects. Only then could industry-wide practices be advanced with any certainty based on results of this study. To improve the possibility of identifying patterns within the sample, it also had to be somewhat uniform. Objects with basic similarities to others in the sample stood a better chance of duplicating parts and practices. While diversity would obviously enrich the study in many ways, this dimension would come at the expense of providing more substantive evidence for the primary concerns of the study. Consequently, some objects sharing few characteristics with the majority of the sample were not included. The number of chairs rejected for this reason was
small, certainly less than one in four or five. Although the effect of this decision upon the outcome of the study cannot be identified fully, it most likely helped concentrate the geographical and temporal origins of the chairs, making the total sample more representative of urban Philadelphia work during the dominant years of the Chippendale period (1755-1790).

The initial sampling of object data also contributed to a clearer understanding of how they could be used to answer specific questions. The most important realization to emerge was that fewer problems could be resolved than originally anticipated. This situation stemmed from the relatively small number of different types of patterning in the data (many of the points of comparison listed on the worksheet did not prove productive) and from the low frequency of repetition within each type. While many of the original questions and objectives could not be pursued with much expectation of success, the data suggested many new areas of inquiry in addition to shaping existing notions.

As the study progressed, a final sample size of one hundred chairs, including both arm and side chairs, seemed most suitable to satisfy the purpose of comparative analysis. This number allowed a full range of ideas to be...
advanced and explored. A number two, three, or ten times larger would surely improve the statistical foundation for some of the observations and conclusions, but many considerations mitigate against expanding the sample size. Field work under these circumstances becomes an enormous undertaking. Major collections of these chairs were studied first, and to increase the sample size, many smaller collections would have to be visited, thereby increasing travel time and related tasks appreciably. At the same time, little growth in the ideas generated by this additional work is likely to occur beyond the present scope—most results were already visible in the data pool after fifty or sixty chairs were examined. The primary benefit of such an extended study would be a significantly improved technique for recording patterns evidenced by workmanship of habit.

Aside from field work, limitations also exist in correlating the data. The data were correlated "by hand." Most relationships were first formed in memory, then verified and refined by sifting through the worksheets. With an object as complex as a Chippendale chair, a sample size of around one-hundred objects proved still manageable. Limitations imposed because of the manner in which data were treated raise the possibility of using other data storage systems. For discussion purposes, these alternatives may be considered as either mechanical (e.g., MacBee
File Cards) or computerized. The chief difference between these two system-types is the amount of time required to put information into the respective system, how easily and in what form it can be retrieved, and the cost. Putting aside the relative merits of each, both systems can only record specific and quantifiable values. Neither can record such data as are represented by full-sized templates and other means for discerning workmanship of certainty.

The need to translate empirical information from the object into a form suited to highly efficient data retrieval sometimes forces a choice between a less detailed record of the object on the one hand, and numerous data categories for a single object-property on the other. Since each variation of a property requires its own code or number to store the information in such a system, some variations might need to be combined into a single trait to reduce the number of variables. The decoration of the rear post of a side chair, for example, requires at least fifteen spaces, to which armchair variations must be added (see Appendix C).

These remarks are not meant to suggest that mechanical and computerized systems are inappropriate for comparative studies involving objects, but rather to point out some differences in these methods. Implicitly, of course, this brief discussion attempts to defend an informal worksheet system as not necessarily second best and subject to
improved analytical procedures, but as offering its own distinct advantages. With a relatively small sampling of objects, the flexibility of brief written descriptions in essence abbreviates the task of systematically recording data.

Statements and interpretations drawn from a comparative study of a relatively low number of objects must be commensurate with the nature and extent of the data. Most scholars agree that the objects that survive today do not represent an accurate cross-section of what was probably produced and used in the eighteenth century. Instead, rates of survival have been higher among objects of the better sort (and among those which are simply more durable for whatever reason). Unfortunately, no study has been made to date that attempts to define such rates of survival, but mention of some of the forces behind this skewed representation lend support to this profile. Objects may be preserved because of their association with great individuals or events. Typically, these special people or occasions merit the use of the more prestigious objects of their time. (George Washington was probably allowed to sleep in the best bed in the best room.) Less selectivity occurs when objects are saved as part of a larger body of family-held possessions. However, here too, some extra care was probably extended to those more valuable items like ornately
carved or expensively upholstered furniture or silver in contrast to rush-bottom chairs or pewter. Even as objects are sold out of families or fall into disuse because they are replaced by more stylish objects, they may be saved because of some innate quality of their design or workmanship that maintains their value to someone beyond their "useful" life. Again, these attributes most often apply to the better objects. All of these influences upon object-survival cause a significant unknown factor to be introduced into any analysis (structural or otherwise) of objects. Without a clear idea of the biases, many interpretations drawn from a sample cannot be cited as evidence of widespread practices or ideas, but must be limited to specific or localized circumstances.

Historical distortions caused by biases in the sample can be avoided, or at least minimized, by careful attention to the kinds of questions asked of the objects. This phase is essentially a refinement of the basic objective that gave rise to the initial framework of the investigation, and it is a necessary response to the rather fixed body of artifact source materials. The study-objects assembled here are considered as reflecting the better and best products of eighteenth-century furniture-making in the Philadelphia region; they are not assumed to be a representative cross-section of what was made. However, this slant
becomes relatively unimportant when the objects are considered as products of workmanship, and not as carriers of style or vehicles of taste, symbolism, or other cultural values. (This bias is also of little moment in discussions of non-historical questions like modern appreciation of the objects.) The organization of basic manufacturing processes for a single form (in this case a framed chair with pierced splat) is not related to objects of a particular level of quality, but permeates all products of the industry. Many avenues of inquiry in this study rely on structural practices that are so basic that every chair must evidence them and usually to the same degree as in any other chair regardless of design or ornamentation. The equivalency of the objects in this study is also supported by the fact that repetitions of more complex patterns of workmanship can be found in chairs of both high and middling quality. The regularity of these repetitions suggests that a larger sampling of object would show even more uniformity in the use of certain patterns of workmanship among chairs of all qualities.
NOTES: CHAPTER ONE


3 David Pye argues convincingly that the function of an object is not an intrinsic property. His claim that the function is imposed upon the object from outside is summarized by his somewhat tongue-in-cheek definition of function: "What someone has provisionally decided that a device may reasonably be expected to do at present." See David Pye, The Nature of Design (New York: Van Nostrand Reinhold Co., 1964), p. 10. The change in function of old furniture from "devices" that facilitate everyday living to objects that rest in museums to be studied and appreciated further illustrates Pye's point.


8Ibid., pp. 165-70.

9This is not a circular argument since the artifacts are selected for study (i.e., related to each other) based on a set of assumptions or circumstances that do not contribute to subsequent analysis. Two separate stages in the development of the argument are represented here.

10Henry Glassie, Folk Housing in Middle Virginia: A structural Analysis of Historic Artifacts (Knoxville, Tenn.: The University of Tennessee Press, 1975).

11Ibid., p. 21. Glassie describes this linkage as "artifactual grammer," 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 (see p. 17).


13Ibid., p. 91.


16Glassie, Folk Housing, p. 17.

17Ibid., pp. 20-21.

18Pye, Workmanship, title of Chap. 1.

19Ibid., pp. 21-23.

20See Glassie, Folk Housing, pp. 30-31, 43, 71 for remarks about incidences of "ungrammatical statements" that lie outside "architectural competence."

21Trent, Hearts and Crowns, pp. 25-29.

22Trent's hypothetical sequence of events in the development of a turned-chair design begins with the selection of the seat depth (ibid., p. 26).
It is important 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, thus cut across shop boundaries in some cases.


Various studies suggest that machine technology existed years before it was actually 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. The iron industry was also not technologically current with England's. See Nathan Rosenberg, Perspectives on Technology (New York: Cambridge University Press, 1976), pp. 32-45. David S. Landes attributed the delay in milling-machine improvements in part to lack of demand, though 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 [New York: Cambridge 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, England: Cambridge University Press, 1967),
p. 92ff.


35 John Carl Thomas, conversation with author, 10 October 1978.

36 A likely place to look for such highly regulated tools is in American arms manufacturing, which best fulfills the pre-conditions for advanced and innovative manufacturing technology. Large armories had access to capital and to skilled workers; they also operated in a highly competitive...

Although these are appropriate period terms, they are replaced by shop-owner and worker respectively in this study to reinforce the view that the furniture industry was competitive and profit-oriented.


Hornor, Blue Book, p. 35

Ibid., p. 77; inventory of John Janvier, cabinetmaker of Odessa, Del., dated 31 January 1801, transcribed in Harold B. Hancock, "Furniture Craftsmen in Delaware Records," in Winterthur Portfolio 9, ed. Ian M. G. Quimby (Charlottesville, Va.: University Press of Virginia for the Henry Francis du Pont Winterthur Museum, 1974), pp. 205-06. The juxtaposition of parchment and patterns in this reference suggest the possibility that templates might have been made of paper in some cases, but all other indications point to wood.


44 "The Case of the Joyners Company Against the Im¬
portation of Manufactured Cabinet-work from the East Indies," (London, c. 1710: typescript), The Joseph Downs Manuscript
and Microfilm Collection (hereafter cited as DMMC), "Research
Papers of R. W. Symonds," 75x69.18, pp. 67-72.

45 Letter dated 15 January 1762 quoted in Charles F.
Hummel, "The Influence of English Design Books Upon the
Philadelphia Cabinetmaker, 1760-1780" (unpublished M. A.
the Historical Society of Pennsylvania, Gratz Papers, Case
16, Box 11.

46 The worksheets used for each chair identify this
element as a stay rail which preliminary research suggested
as a possible period term. Subsequent research, however,
did not confirm this usage. Stay rail appears in reference
to Federal-styled chairs, and probably denoted the rail above
the rear seat rail into which the base of the splat is set.
Some Federal chairs have the splat set directly into the
rear seat rail and have no stay rail.

47 A notable reject from this study is the Cadwal¬
ader saddle seat chair at the Winterthur Museum that has
been identified as one of six "sample chairs" of furniture¬
maker Benjamin Randolph of Philadelphia. This chair is
discussed in detail in Zimmerman, "Methodological Study," a study that grew out of this work.

48 These dates are generally accepted as the boun¬
daries of the style period.

49 Worksheets for over 125 chairs were completed, but
some chairs were in private collections or owned by dealers,
hence not generally available for inspection. A few other
examples were known to be Maryland or New York products and
were cut from the study to localize the sample. Finally,
chairs at the Department of State were omitted to bring the
sample size to an even one-hundred chairs.

50 See Appendix A for a list of the chairs, arranged
by institution, that were examined for this study.
CHAPTER TWO: A COMPARATIVE STUDY OF
PHILADELPHIA CHIPPENDALE CHAIRS

The comparative study of Philadelphia Chippendale chairs was meant originally to culminate in a number of distinct chair groups based on common structural properties with each group representing the products of a single shop. Following this sorting operation, the makers of some of the chairs in the sample were to be identified by labels and other maker's marks or through firm attributions set forth in existing scholarship. These chairs would then become the basis for extending maker attributions to other chairs within the respective groups. The consequences of this study would be twofold: an increase in the number of chairs whose makers are known, and an opportunity to use and synthesize some of the available research on individual furniture-makers and their wares.

Examination of the sample of chairs resulted in a considerable number of chairs that bore no significant structural relationships to any others. It seemed that either the criteria for establishing chair groups was too demanding, or there were too many shops represented in the
sample to allow the objects to cluster into the anticipated groups. The latter circumstance is more likely the chief cause of this failure since upwards of one-hundred shops probably operated in the Philadelphia region during the period when these chairs were made.\(^1\)

In the absence of a larger end, the means themselves assumed greater importance as a viable product of the structuralist investigation. The emerging patterns and the relationships that they suggested support simple facts or ideas pertaining to the manner in which these chairs were made. When drawn together and interpreted in light of surviving manuscript evidence, these many facets form a comprehensive picture of a chair-making industry that, in the mid-to-late eighteenth century, incorporated many aspects of modern manufacturing.

The task of defining and presenting the many patterns and their place in the larger picture is best organized by the categories of workmanship. Alternatively, the material could have been presented based on the form of the chair (discussing patterns chair-part by chair-part, for example), or on the relative complexity of the patterns (from simplest to most complex). The first requirement of applying the workmanship framework to the study of these objects is to show that distinct characteristics of workmanship are
revealed by them. Once this step has been accomplished, the technique of relating objects based on workmanship can be refined further and the results assessed.

Since workmanship of certainty is theoretically the most reliable means of establishing relationships among objects, it is an appropriate place to begin. Its conjectured visibility in splat templates can be tested easily: a template used in two or more chairs must be found. To accelerate the chances of finding such a duplication, the first chairs examined were all of a single splat design. Eventually, a duplication did occur, thus confirming the hypothesis that 1) templates were used in the fabrication of chair-parts, and 2) at least one manifestation of workmanship of certainty could be recognized in the sample.

The two chairs in question have strapwork splats, the most common design among Philadelphia chairs (Figs. 4 and 5). Aside from this obvious similarity, they display little visual relationship to each other. Indeed, their visual attributes are sufficiently different that until recently one had been attributed to Maryland and the other to Philadelphia. However, a splat template reconstructed from the less ornate chair fits exactly the outline of the splat of the other chair. The only detectable difference lies in the treatment of the base of each splat, which is a
Figure 4

Side chair. Thought to be part of George Washington's furnishings during his stay in Philadelphia. (Winterthur Museum, 58.2258.)
Figure 5

Side chair. History of ownership in the Lambert family of Philadelphia. (Winterthur Museum, 58.3091.)
solid rectangular mass on the first, and an ogee-shaped base with a circle pierced in its center on the other. All of the embellishment of the latter base is wholly contained within the outline of the former, indicating with reasonable certainty that the one splat (and by implication the entire chair) is merely a more ornate version of the other.

The splat-template duplication was the first among many (see Appendix D, Table 1). Most repetitions involved only two chairs; the largest number of chairs from this sample to share a single template was five. In all, twenty-seven of the one hundred examined formed eleven groups with common splats. Little significance can be attached to this one-out-of-four frequency because the sample does not represent a truly random selection of objects. Nevertheless, the approximate order of magnitude makes believable the claim that templates were in fact commonly used in fabricating Philadelphia Chippendale chairs. Had only one or two duplications occurred, this claim would remain largely speculative. Similarly, a considerably higher incidence might raise the criticism that the criteria for identifying the reuse of templates were too lax.

Evidence of workmanship of certainty in chairs is exhausted once templates have been examined. Evidence of workmanship of habit, on the other hand, appears in many
different areas, each of which illustrates a regulated facet of furniture production. Since habit by definition is not a completely regulated act or process, it may deviate from a norm or vary 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.

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, two chairs may share a certain construction feature, but no particular significance can accompany this identity on the strength of the single observation. Further comparisons with other chairs may reveal that the practice in question is common, or at least sufficiently widespread that a common origin for the two chairs cannot be postulated on the basis of this one factor. Relationships become strong, even compelling, when similarities among certain objects can be established to the exclusion of all other objects. Each incidence of workmanship of habit, then, must be qualified by its frequency throughout the entire same. Some relationships can be based on multiples of weak traits, that by themselves are insufficient, if the frequency distribution throughout the sample isolates a selected group of objects.
sharing all of these traits.

The second criterion necessary to determine workmanship of habit requires that the trait under scrutiny be a choice of the shop-workers, not of the patron who ordered the object. The fact that a chair has Chinese-lozenge decoration on the stiles is not a suitable basis for suggesting relationships with other chairs since that feature probably represents a decision on the part of the buyer. Likewise, the use of ogee moldings or fluting cannot serve this purpose. However, a detail such as the number of flutes that comprise the ornament can be used. In this case the patron has already left his influence on the object through the choice of what kind of decoration should be added. The shop-owner, meanwhile, is left with the choice of how he should meet the consumer's demand for fluting. This demand can be satisfied equally well by cutting either three or four flutes. As with the splat templates, the shop-owner responded to specific instructions, but carried out the details of these orders in his own characteristic way. Moreover, the shop-owner can be expected to employ his particular mode each time until some form of outside pressure causes a change. This is not so much an inability to overcome inertia as it is a resistance to change based on the strength of tradition. The forces of change are commonly tied to the introduction of new styles or technology,
and either the shop-owner or the patron may be the actual catalyst of change. Some slight change in traditional or habitual modes may be detected over time; they can be attributed to "drift," what George Kubler describes as the "tiny unwanted variation" that accumulates when an action is repeated over and over again.4

Various manifestations of workmanship of habit are clearly evident in a group of two side chairs and two armchairs. The side chairs are mentioned above as sharing a single splat template. Once these chairs are associated with each other on the strength of this identity, many other similarities emerge. These common denominators confirm a common origin for the chairs when these likenesses are compared to the entire body of Philadelphia Chippendale chairs. The armchairs not only reinforce this relationship still further, but contribute new areas of favorable comparison.

No single feature stands out as a "shop signature"; instead, a combination of traits distinguishes the two side chairs from others in the study. Each trait satisfies the requirement that it represent a choice of the maker, not of the purchaser. A listing of these points of comparison, accompanied by a brief explanation of each, helps illuminate the procedure for recognizing and using workmanship of habit. (The comparative points are arranged by the location of the

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feature on the chair; the order of discussion does not reflect the relative strengths of each point.)

1. The splat is secured to the crest rail using "quarter-blocks." These little pieces of wood are glued to the back of the splat on one face of the block and to the underside of the crest rail on another face (Fig. 6). This relatively rare construction feature strengthens the tongue-and-groove joint between these two chair-parts. In most chairs only a tongue and groove is used to secure the splat to the crest rail. Quarter-blocks can be detected by the back part of the grooved crest rail, which extends below the front part, and by horizontal seams between the block and crest rail where they join. The use of this technique has no bearing on the appearance of the chair, thus it is a good indicator of workmanship habits.

2. Each chair has a carved shoe with a similar "shallow-hollow" profile. This feature is the least reliable of the four, but still deserves mention as an additional point in common. Most chairs do not have carving on the shoe. There is a slight chance that customers actually specified this detail when ordering their furniture, but it is so minor that its treatment was probably left to the discretion of the chair-maker. The distribution of carved shoes among the various groups of related chairs supports
Figure 6

Line drawing showing the back of a crest rail and splat reinforced with quarter blocks.
the latter view.6 The profile of the shoe is distinguishable from the others in that its curvature does not exceed an upright perpendicular.

3. The inside of the rear rail, which is thinner than the depth of the rear post, is built out to meet the front plane of the posts with wooden spacers or blocks. Squared corner blocks can then be glued to strengthen each joint of the rear and side rails. Without these spaces, corner blocks must be notched to fit properly, Alternatively, the entire rear rail may be cut to the same thickness as the posts. This practice requires expenditure of more wood, though it may save labor. Occasionally, secondary wood is laminated onto a primary wood (which is visible only from the rear) to build up the thickness of this part (see Fig. 7). As with quarter blocks, the outward appearance of the chair is not affected by the use of any of these techniques.

4. The rear legs on both 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 includes completely rounded and chamfered legs. Marlborough legs are yet another type, but they appear in response to the buyer's preference.

The association of these two chairs by virtue of
Figure 7

Line drawing showing partial view and sections of three types of rear legs: a) rounded, b) rounded with straight sides, c) chamfered.
Figure 8

Line drawing showing plan of seat-frame construction: a) rear rail with blocks, b) flush rear rail, c) laminated rear rail.
their intrinsic properties is reinforced by their respective histories, which place ownership of both of them in Philadelphia. The floral-carved chair has long been identified as a part of the furnishings of the Lambert family of Philadelphia. In 1941 the other chair (or one identical to it) was published as one of five used by George Washington during his stay in Philadelphia. Regretfully, no evidence beyond oral tradition was given to support this provenance, and the set of chairs joins two other sets also thought to have been used by Washington. Although the evidence is inconclusive regarding the Washington association, 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 object examination which points to a common origin.

An armchair to the set of Washington-associated side chairs can be related to another armchair (Figs. 9 and 10). When these two armchairs are considered as products of workmanship of habit, numerous common denominators, which distinguish these chairs from all others, can be identified in the same manner as with the two side chairs. The four points listed in reference to the side chairs apply to the armchairs. In addition, the use of four flutes (rather than three) on the rear posts, the fact that the flutes are interrupted in the same way on each chair at the juncture of
Armchair. Part of the same set of chairs as Figure 4. (Winterthur Museum, 58.2256.)
Figure 10
Armchair. (Winterthur Museum, 58.2255.)
the arms, coupled with the distinctive properties of the arms themselves (including the lack of knuckled terminations and the use of through-tenons to secure them to the posts), provide more corroborative evidence that the armchairs were made in the same shop as the two side chairs.

The "ribbon-back" armchair and the Lambert side chair show the same workmanship of habit in an area peculiar to them, even though they were originally related to each other only through the Washington chairs. The maker of these chairs, as yet unidentified, chose to embellish further the rather common strapwork splat of the Lambert chair by shaping the sides of the base and by drilling a hole in its center. This response to the problem of providing an extra degree of ornamentation in a given design reappears in the base of the ribbon-back splat. Typical treatments of this splat-design either leave this lower triangular mass solid or follow its outline with a pierced triangle.11 The use of a drilled hole to resolve this apparent design problem is unknown outside of this group of chairs. (Another chair can almost certainly be added to the three different chair-designs comprising this group on the strength of photographic evidence alone. This chair has a back like the Lambert chair, but a base more typical of Philadelphia-made chairs.12)
The formation of this group of chairs serves as an example of how patterns of both workmanship of certainty and habit can be recognized and used to develop relationships among Philadelphia Chippendale chairs. The subsequent use of this material is twofold. First, specific conclusions can be drawn from this particular grouping of objects. Each chair can be identified as a product of the same shop as the others in the group. Had one chair been labeled or the maker known by some other means, the others could also be ascribed to this source. These immediate results are of limited value until they have undergone an "abstraction process," as Glassie termed it, in which they are generalized and applied to larger issues. In this second use of the material, many of the immediate findings may prove incidental or otherwise unsuitable for interpreting the objects further. This limitation is visible in the use of a drilled hole in the base of the splat: it is an important factor in identifying some chairs as belonging to this particular group, but its importance beyond this one concern is negligible. When considered in light of all Philadelphia Chippendale chairs, this practice is but one aberration among many.

In contrast, other observations lend themselves to discussions of larger issues. For example, differences in the character of carved work and other decorative details evident within this group of chairs raise the question of
how much variation is possible in work from a single shop. The answer not only affects an understanding of these chairs, but of how others should be perceived. Likewise, the appearance of standardized parts (seen in the side chair splats) contributes to knowledge of furniture-making practices in general.

The differences between the two side chairs cannot be dismissed as mere substitutions within a larger framework of uniformity. Though some details are substituted from one chair to the other—like vine-carved stiles for fluted ones, or a scalloped front rail for a more common manner of lightening its appearance—differences in the form and organization of substantial areas of each chair separate them. In overall terms, the decoration on the Washington chair fits within a range of ornament often found on more stylish Philadelphia Chippendale chairs, but that on the Lambert chair lies considerably outside this spectrum. Specifically, the typical rolled-back ears with volutes carved into their "sides" on the Washington chair are, in effect, turned nearly ninety degrees to give a completely different aspect to the crest rail of the Lambert chair. Moreover, they are planar rather than three-dimensional. Differences in the organization of design elements is evident in the carved shell, too. The one falls within the conventional Philadelphia idiom of a distinct oval shell; the other has been
altered so that it joins other carved details on the chairback. The placement of carving on the Lambert chair also distinguishes it from most Philadelphia Chippendale chairs. While some other chairs do have carved stiles and shoes, very few are carved along the seat-rail molding or have foliate-carved front rails. Yet another difference of note 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 differences between these two chairs violate the concept of an habitual response to a particular problem—ornamenting a chair in this instance. These differences in turn might lead to the suggestion that the two chairs had separate origins despite the strong similarities in patterns of workmanship evident in their construction. The resolution of this apparent dilemma lies in the view that these, and most other Philadelphia Chippendale chairs, were not each 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 individual tasks—cutting, shaping, fitting, carving, and so on. These tasks were not necessarily performed by the same worker, nor
was the level of skill required to complete each always equivalent. Some tasks could be performed in the same way regardless of the design of the chair; others could not. Those in the former category, like cutting and joining seat rails, shaping rear legs, and cutting splats from solid stock, could be made easier through the use of templates, standardized techniques (i.e., shop-wide practices), and other work-regulating measures. Shop-wide regulation of these tasks saved time and effort since the worker did not have to plan each task in its entirety, nor consider the effect on the finished product of using one procedure over another. Furthermore, increased regulation of work allowed the use of less-skilled labor for those tasks. Both of these factors cut labor costs in areas that did not contribute significantly to the appearance of the final product. This latter concern was fulfilled by another set of tasks that constituted the finishing stages of chair-making. These tasks, which generally fell outside the scope of shop-wide controls, were performed to satisfy the demands and expectations of the customer. He determined, or at least influenced, the selection and treatment of various decorative motifs, the amount and nature of carved work, and other style-sensitive matters. At times, the desired results required that specialized and highly-skilled workers be used in these finishing stages. Always, the customer paid
according to the amount and quality of this work.

Seen in this light, the chairs in question no longer demand to be considered separately. Instead, their outward differences stem from different customer demands made of the same shop. It is impossible to say whether, in satisfying these demands, the shop-owner remained within the capabilities of his own shop or whether he had to hire outside carvers or other workers to complete the work. Regardless, the consequences are the same when the chairs are examined today as anonymous artifacts. Similarities among objects may exist within certain stages of their manufacture, and they point to a common origin at that level. Differences in surface treatment and in other style-sensitive features of chairs may indicate separate origins for that work. Finally, the fact that chairs were made in discrete stages—general chair-making tasks and specialized tasks affecting appearance—requires that each stage be treated separately. The shop origin of a chair, for instance, cannot be determined with any great degree of certainty by examination of properties that were influenced by customer preferences.

When the armchairs of the Washington-Lambert group are considered, the effect of customer demands on the outward appearance of each chair is highly visible. However, in this instance the demands were satisfied through inter-
changing parts rather than using different workers (or if one worker, a completely different approach) to ornament each chair. Except for the substitution of a different splat, the shape of the front rails, and the use on one of a carved motif above the juncture of the front leg and rails, the armchairs are virtually identical. The interchangeable splats on these chairs suggest that other splat designs might have been used, and in most cases they probably could be integrated into the surrounding framework with little alteration of standardized parts. The deep front rail of the ribbon-back armchair is clearly a feature added to the basic chair-form in order to allow this example to accommodate a chamber pot without it being visible from the front. This particular adaptation required additional labor and materials which was probably reflected in the price of the chair. The other difference may have been too small to have been requested by the customer. Certainly many specific features were discussed between buyer and seller, but even so, much may have been left for the shop-owner or chair-maker to resolve. Rather than stipulating each detail, customers may have ordered their chairs by general reference to a neighbor's set, noting only certain changes to be made.

In sum, an examination and interpretation of this one group of chairs suggests that individual shops made
products that were both standardized and adapted to customer's specific demands. Necessarily, the range of style-sensitive features any one shop could offer had to be broad enough to satisfy many customers' desires. Shop-owners provided this variety by interchanging parts and by altering standardized parts or designs. These initial findings are reinforced and detailed further in similar occurrences in other groups of structurally-related chairs. By drawing on this larger body of objects, many general practices and characteristics of the chair-making industry in Philadelphia in the Chippendale period can be identified.

Among chairs made in the same shop and using the same splat design, countless small decorative and structural details distinguish one set of chairs from another. Differences may exist in the numbers of "lobes" (five or seven) that make up a shell applied (in either direction) to the front rail; in the use of hollows or ogees with or without fillets in terminating the undercuts on front, side, and back rails; in the sequences of pins used to secure rails to the legs; and in many carved details, to name some. So much opportunity exists for variation among these rather insignificant details that some change invariably takes place from one set of chairs to another. On the other hand, chairs from the same set show virtually no differences in any property, indicating careful attention to reproducing each feature.
exactly like the others in the set; though "hand-made," they are remarkably uniform. Any difference in chairs thought to be from the same set must be accountable as subsequent alterations (e.g., wear, damage, repairs, or restoration).

Otherwise, the chairs represent different sets.

The requirement that chairs within a single set look alike down to the smallest detail is based on evidence from surviving chairs. First, those chairs that do survive in complete or partial sets exhibit this degree of uniformity. Often, chairs from a set that has been dispersed through the years can be reunited (at least on paper) if all of their details compare favorably. Conversely, chairs that have been assembled as a set because of their overall similarities can be divided into groups representing their original sets on this basis. The placement and execution of Roman numerals, which were stamped consecutively inside the front or rear rail of each chair within a set, are helpful in this kind of sorting. They are also useful in supporting the notion that identical chairs must be from the same set: no two chairs, identical in every detail, have been found with the same chair-number (hence from different sets) stamped on each. The highest number within a group of identical chairs establishes the minimum number of chairs comprising that set. Sets of six were common, as Hornor has noted, but many larger sets were also made, as evidenced by these.
impressed numbers. Armchairs that accompanied sets of side chairs were either numbered separately or in sequence with the side chairs, beginning either before or after them. Only a few side chairs were never stamped. They may have been sold singly, but such a deduction is not supported by personal estate inventories which invariably list them in sets. It is more likely that the practice of numbering chairs within a set was simply not always followed.

The interpretive content of chairs grows richer as the variations increase among those from the same shop. At the near end of the spectrum, the many small changes from chair to chair are popularly understood as by-products of a non-mechanized industry: each worker had considerable room in which to modify and innovate, since so much hand-work was involved. These differences have also been ascribed to the worker's opportunity or need to express himself creatively in his work. However, as changes from chair to chair become more pronounced, a definite pattern emerges suggesting that the more substantive changes still take place within shop-determined boundaries. Object examination gives a clear indication that most of these chairs were designed and engineered to accommodate this capacity for interchanging and modifying parts.

The most visible changes among chairs from a single
shop occur as substitutions of major parts—namely the splat, the crest rail, and the legs. Specific crest-rail designs tend to accompany particular splat designs, changing as the splat changes, but they may change independently in some cases. Various groups of chairs, related to one another through the use of identical splat templates or by common features of workmanship of habit, display this practice. Notable examples are two marlborough-leg chairs that are identical to each other in all respects except for interchanged splats and crest rails (Figs. 11 and 12). A third chair of this group uses the same trefoil splat and rolled crest rail, but has cabriole legs (Fig. 13).

The selection of major parts created the basic outline of the chair's appearance. Some customers, undoubtedly, were satisfied with chairs assembled directly from standardized parts without modifications. Ornamentation on these examples was probably confined to a few popular features including molded stiles, some relief carving on the splat, and simple shells on the knees and crest rail. Much of this kind of furniture may have been made on speculation by shop-owners and sold in their shops as "ready-made" wares. But an essential aspect of the business was making furniture to order—and keeping it within "reasonable terms." Shop-owners could gain a competitive edge if their chairs could be made to an individual's taste without having to re-design
Figure 11
Side chair. (Winterthur Museum, 61.1196.)
Figure 12
Side chair. (Winterthur Museum, 61.1198.)
Figure 13
Side chair. (Museum of Fine Arts, Boston, 41.601.)
parts. Examination of many ornate and high-quality chairs reveals that, in fact, standardized parts were modified in simple ways to alter the visual impact of the object, sometimes creating a significant difference in the appearance.

Two side chairs made in the same shop demonstrate an effective use of parts-modification (Figs. 14 and 15). Both chairs use the same splat template and share many decorative and structural characteristics, yet the visual effect of their overall proportions is different—one is tall and lean, the other is considerably broader and shorter. These properties in the latter have led some furniture aestheticians to single it out as a paragon of urban high-style design and proportion. Nevertheless, the transformation from one expression to the other is simple, and it stays within the limitations of parts-standardization. In essence, everything remains the same on each chair except for the lengths of some parts. The seat rails are cut slightly longer on the short chair, thus emphasizing its breadth. Verticality is achieved in the taller chair by extending the splat two inches at the base and adding two inches to the stiles at the top. The crest rails on the two chairs measure within one-quarter inch of each other.

Adjustment of the splat at its base to fit the part into the space determined by the crest-rail height was
Figure 14

Side chair. (Museum of Fine Arts, Boston, 39.169.)
Figure 15

Side chair. (Museum of Fine Arts, Boston, 39.168.)
common. In this way the same splat template could be reused regardless of what the overall height of the chair was to be. In general, the splat design itself imposed a minimum height. 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 designs might be varied in length perhaps one-half inch). On one occasion, however, a worker circumvented even this limitation in order to avoid remaking a template to fit a short, broad chair. Using a standard splat template, he shortened the entire design by first outlining the upper portion on the wood to be cut, then sliding the template up an inch, effectively removing a horizontal strip from the middle. This time-saving technique is indetectable in the final product without actually experimenting on it with a template (Fig. 16).

The modification of standardized parts to hold down costs played a key role in the manufacture of armchairs—or what appear to be armchairs. True armchairs are distinguishable from side chairs not only by the addition of arms but by larger overall dimensions and heavier parts throughout. Only the front legs usually remain the same size as in side chairs since the height of the seat from the floor was more or less fixed at about seventeen inches. The differences in size between arm and side chairs was reflected in a
Figure 16

Side chair. (Metropolitan Museum of Art, 08.51.10.)
greater cost of the former to the customer. The added charges had to cover the cost of making arms and the additional material necessary for the increased size of most of the parts. Further costs lay in the need to produce a second set of templates if all of the elements of the armchair were to be increased proportionally. The time-value invested in making these extra templates had to be recovered somehow. If armchairs had been made in any great numbers at this time, these non-recurring expenses could have been spread over many sales. But armchair production was low, probably no more than a few per year, even in the largest shops. Consequently, a premium had to be paid for these chairs.

To combat one-time design costs chair-makers offered alternatives. The simplest way to save the expense of making an armchair splat template was to use an existing side-chair splat template and extend it at the base to fit into the larger chair, thus producing an armchair with a side-chair splat (Fig. 17). This practice alters the visual impact of the chair somewhat: the narrower side-chair splat leaves larger spaces on either side between it and the stiles, and a large solid mass remains at the base of the splat.

A second way to produce a less expensive armchair was to install arms on a side chair, which saved money in material and labor costs and in template-design costs.
Figure 17
Armchair with side-chair splat.
(Winterthur Museum, 61.810.)
Hornor cites a price of ten shillings, six pence, as the additional charge to the basic side-chair cost, which represents a savings of over half of the added cost for an armchair over a side chair. The ease with which a side chair might be converted to an armchair in this way is best illustrated by examples whose arms have been removed since. In this reconverted state they are indistinguishable from any other side chair except for necessary repairs to the stiles and side rails where arms were once fitted (Fig. 18).

A third technique for reducing the cost of armchairs is visible in two chairs from an original set of six side chairs and two armchairs. 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 and armchairs. But unlike the armchair with a side-chair splat, the splat in this case is nearly of armchair size—in other words, it represents a compromise between the design needs of the side chair and the armchair. Its effect on the appearance of the side chair is to crowd the space between it and the stiles. A small adjustment in the length of the splat is again visible at the base of the splat (Figs. 19 and 20).

Cost-cutting measures are also evident in the way arms were attached to the stiles. In the more time-consuming
Figure 18

Side chair with arms removed.
(Winterthur Museum, 59.785.)
Figure 19

Side chair. History of ownership in the Crow family of Odessa, Del. (Winterthur Museum, 76.114.1.)
Figure 20

Armchair. Part of the same set of chairs as Figure 19. (Winterthur Museum, 61.806.)
method, the arm was tenoned, pinned, or screwed into a projecting nodule on the stile that was contoured to follow the lines of the arm. Alternatively, the arm was cut to fit around the stile or channeled into it (Fig. 21). Either way, this technique was easier to perform than the former. Without the nodule, the entire upper portion of the stile could be rounded in the back with a draw knife without having to measure off and work around the projection. Moreover, since these stiles were the same for both arm and side chairs, additional cost-savings might be realized by the fabrication of a larger number of identical parts at one time. (After the part was cut out and shaped, it was shortened to the proper length to fit the size of either a side or armchair.)

The arm-stile joint having a nodule may have been slightly stronger than one without, but either joint was sufficiently strong to withstand most reasonable stresses. The 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. Thus, those shop-owners 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, and so forth--may have selected the nodule arm joint. Evidence is insufficient to ascribe much decision-making regarding these
Figure 21

Line drawing showing 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.
to the customer. His preferences were probably felt only indirectly by his patronizing one shop rather than another based on his reaction to the kind and quality of furniture he knew each produced.

The technique for securing arm supports to the side rails surely varied as a shop-wide practice with no preferences voiced by the customer. Arm supports were either contoured to fit around the side rail (including the molding along the upper edge), or they were fitted into a measured cut in the side-rail molding (Fig. 21). Either method involved approximately equal amounts of cutting and fitting, and neither changes the result visually or in structural strength.

Object examination revealing the presence of standardized parts and parts-substitution cannot establish how extensive these two chair-making practices were in Philadelphia (and elsewhere by implication). The sample size is too small to plot clear boundaries of use, and the lack of exact geographic origins for most of the examples precludes making even a rough estimate. Instead, this examination shows only that the practices existed. In a similar way, written references are not rich enough to fill out the picture. They cannot provide much more than an indirect confirmation that these practices were followed. The techniques and skills of
the furniture-maker were passed from one person to another orally or by demonstration and were not the subject of written accounts.

Estate inventories of furniture-makers verify the practice of stockpiling furniture parts in shops. Among the furniture parts listed in Joshua Moore's 1777 inventory, for example, are: 8 mahogany back feet, four sets of mahogany and one set of walnut table legs, a "quantity of table feet," 159 walnut and 62 mahogany banisters, and 13 tea table "pillers" (i.e., columns). Joseph Armitt, who died in 1747, owned "72 banisters for chair backs" at one time, presumably at his death. Other inventories list chair rails and feet, crooked chair backs, and numerous parts for turned chairs. Together, these references identify what parts were stockpiled, but they do not reveal the source for these parts. Most parts were probably made in the shop for shop use by employees working to designs and standards set by the owner. Some parts, however, were supplied to the furniture-making trade by parts-jobbers, or they were sold as surplus stock by large shops. Thus in 1767 Samuel Williams, a cabinetmaker, 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 for sale "a quantity of mahogany and walnut chairs and table feet, bannisters, &c. Mahogany veneers,
carved work for furniture, etc."29

Independent of object-based evidence, written references to parts-stockpiling suggest some degree of parts-standardization. Stocked parts must have been essentially uniform since little or no economic benefit could be realized by the shop-owner if these parts required much fitting and modification before they could be used. The question that remains is not whether they were standardized, but to what extent. Were feet carved out completely? or their shape merely blocked out and the part awaiting further carving and finishing work? Similarly, were splats (banisters) stocked as 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 mortices pre-cut, 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. It suggests that in addition to standardized decoration, certain aspects of the construction of the entire chair may have been standardized. Thus, if this description is correct, front legs may have been standardized in height and shape—all claw feet looking 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 out from it at a later
time); and further, pre-cut mortices on these legs would require tenons of a pre-determined size, perhaps influencing the size of the rails. Other pre-determined features of construction would affect other aspects of the design and appearance of the chair in similar ways.

Neither written nor object-based evidence yields any clear patterns of standardization. This lack of patterning points to what is probably the most accurate interpretation: the degree of standardization varied from shop to shop, and perhaps changed over time within a single shop. Some shops may have standardized certain parts (or construction techniques) that other shops did not. Even within a shop, the degree of standardization may have change, especially as the nature or volume of its output changed. Some shops formerly specializing in turned furniture may have broadened their range of products to include a larger selection of joined furniture, or vice versa. These shifts required (or resulted from) changes in personnel, in the tools and templates that were on hand, and in overall shop organization. Moreover, the dissolution or establishment of partnerships and the sales of sets of tools or entire shop-contents contributed to an unstable degree of parts-standardization.

Although most standardization was limited to a shop-wide context, some furniture parts were standardized
throughout the industry. The two groups of parts that surviving manuscripts identify—small ornamental work and large turned parts—connote particular circumstances. In the former instance, specialized skills filled the rather limited demand for these products. In the latter, merchants and artisans able to obtain lumber in quantity had some of it turned to make simple and often-needed parts. They then sold these parts along with other pre-cut boards and "scantling" to the trade. These lumber and parts suppliers were not necessarily the same group of people. Sources for these materials may have shifted from one person or establishment to another depending upon who was able to secure shipments of wood. However, many individuals with reliable trade connections probably were recognized as constant and dependable suppliers.

As surviving chairs clearly show, standardization of some chair parts allowed shop-owners to substitute easily a part of one design for another of a different design, as customer preferences dictated. A 1772 furniture price list, printed in Philadelphia and apparently distributed throughout the furniture-making trade, lends additional support to this view. Indeed, an analysis of the format of this and subsequent price lists yields a profile of shop production in Philadelphia that calls to mind the results of the structural examination of chairs from these shops.
The picture the 1772 price list presents is one in which a single furniture-form was modified piece by piece to meet customer demand. The list is arranged by form, and one or more basic, or "core," objects (such as an arm or side chair, a desk, or a table) heads each category. Numerous modifications of these core objects complete the remainder of the price list. For example, a core armchair, valued at £2.18.00, came with a solid splat, cabriole legs, and plain feet. The same chair could be purchased with a "cut through bannester" for an additional two shillings. More ornate versions were available at still higher charges. Such modifications to the core occurred as substitutions of one feature for another or as additions of features to the core. The price of each of these "options" reflected the additional investment in labor and materials.

The precise descriptions and costs of options in the price list suggest a significant level of uniformity in furniture-making practices throughout the industry. At bottom, uniformity existed within each shop: all of the shop-workers understood what form plain feet were to take and how much work was required to make a pierced splat. On a different plane, competition and the inevitable movement of workers from shop to shop argue for a degree of uniformity that permeated the entire industry. Any imbalance in the nature and cost of an option among individual shops would
have manifested itself as a competitive edge or disadvantage in the furniture market. If, as the many advertisements claimed, goods could be had "cheaper and better" from one source, other establishments would have had to conform quickly to stay in business. Thus, market pressures tended to keep furniture options within a narrow band of acceptable forms: claw feet were claw feet, and Gothic splats were Gothic splats. Shop-workers may also have contributed to this uniformity. Common roots in their training and repeated contact with one another throughout their furniture-making careers resulted in what Charles F. Montgomery has described as a "common understanding of [furniture] forms and methods of fabrication."\(^3\)

The similarities between the price list and the chair-groups developed in the object examination lie in the organization of each around cores that allow for subsequent modifications. Each also supports interpretations of industry-wide uniformity evident in certain parts and practices. The temptation is great to draw these two sources even closer together. Seemingly, a written source tracing an economic profile of the furniture industry should correspond very nearly to the structure of the industry as it is interpreted from the objects themselves. However, no one-to-one correspondence is possible because each source measures different things. The price list reflects the various
forms that could be made while the structural analysis considers how these forms were produced.

Another difference stems from the fact that the chair-groups represent actual market-place responses while the price list apparently functioned primarily as a guide for labor management. The list is not mentioned in surviving bills and other manuscripts, suggesting that it was not commonly, if ever, consulted in transactions between the customer and the shop-owner. Furthermore, it may well have been protected from public view. Because it established labor costs and set what were probably retail prices for finished pieces of furniture, the price list was a significant factor in determining the magnitude of the shop-owner's profit margin. Negotiation of these figures and their subsequent distribution to members of furniture-making organizations may have been intended to ease growing pressures between wage-earners and employers.32

Although the direct purpose of the price list did not necessarily pertain to furniture production, still it illuminates an important dimension in this area. 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 chairs, for example, could be purchased with stylish
"through bannesters" (pierced splats) and claw feet, or with Queen Anne-styled "plain feet and bannesters" (trifid or pad feet with solid splats).33 A rare set of furniture drawings, made by Samuel Mickle of Philadelphia and dated 1766, further supports the notion that older motifs were retained into the Chippendale period. In one, Mickle illustrates a side chair with plain feet, eared crest rail, and a solid splat outlined in the typical Queen Anne fashion.34 Moreover, in 1787, Philadelphia cabinetmaker Charles Ford advertised the sale of his remaining stock of furniture including "plain, claw-feet and ornamental chairs of the newest taste."35 In each instance the key factor seems to be economics: the less elaborate chairs, suggestive of the earlier style, were merely cheaper versions. This interpretation weakens 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."36

One last chair design 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" (cyma-curved stiles), and rear-leg brackets—all Queen Anne details.37 The latest feature on
Figure 22
Side chair with compass seat.
(Winterthur Museum, 60.1035.1.)
this type of chair is the pierced splat, which sets the earliest date of its fabrication at roughly 1755.38 The latest manuscript reference to the purchase or use of compass-seat chairs is 1761, indicating an approximate end to their popularity.39 The rarity of these chairs relative to chairs of other Chippendale forms strengthens the view that they were made for only a short while (although this observation may also point to a less popular design that was made over a longer period of time). An important factor in assessing these chairs is that they were expensive to make. Consequently, their appearance probably was not influenced by the cost of labor and materials to any great extent, but depended instead upon the dictates of fashion. As the various components of the new style found acceptance, these style-sensitive chairs assumed the "pure" form of the Chippendale style.

Parts-substitution and standardization play critical roles in understanding chairs of composite designs and compass-seat chairs with pierced splats. In the former instance this economic interpretation provides a reasonable foundation for why certain Queen Anne motifs retained their popularity well into the succeeding style period. Moreover, it can account for why these motifs finally disappear with the arrival of the Federal style. Chairs of this new style differed sufficiently from Chippendale chairs in design and
construction that parts-substitution was neither practical nor visually acceptable—the old patterns simply could not fit into the new core.

Compass-seat chairs occur as products that mix Queen Anne-styled parts with Chippendale parts, and they rely on the practices of substitution and standardization. In the compass-seat chair pictured in Figure 22, two highly visible substitutions—claw feet and a pierced splat—separate it from pure Queen Anne examples. Claw feet, which had been a part of the Philadelphia furniture-maker's design vocabulary since the late 1740s, are also found on similar chairs with solid splats. The "open back" of the chair in question is not mentioned in manuscripts before 1754. Here, it is substituted for a solid splat in a high-style, but conventional, Queen Anne core. These parts, standardized within the individual shops by the use of templates, were carried over from the early core to the later one without any further updating or alteration of their design. This practice is evident in a Chippendale chair that uses the identical splat template as in the compass-seat chair (Fig. 23). Together, these patterns of use suggest that the Chippendale style evolved piece by piece over a number of years from its closely related predecessor, rather than as a unified design that gradually gained acceptance.
Figure 23
Side chair. (Winterthur Museum, 59.635.)
Finally, these observations regarding chair fabrication, along with those presented earlier in this study, point to some general conclusions pertaining to chair-making in Philadelphia during the Chippendale period. Fabrication of each chair did not necessarily take place over a single or unified period of time. Parts may have been made weeks, months, or possibly years ahead of the time they were used in pieces of furniture. In addition to parts-stockpiling, some furniture may have been produced as ready-made wares, or on speculation, and have undergone modifications or additional finishing steps after a buyer for them had been located. Production of individual chairs or of sets of chairs was fragmented further by the employment of specialists who were needed at times to complete certain phases of the work.

The conceptualization of Chippendale chairs was fragmented, too. The interrelated practices of parts-substitution and standardization resulted in sections of the chair whose design had been determined well before the rest of the chair was planned, making the final object a combination of givens and new resolutions. Moreover, the uncertainties that surround an historical understanding of shop organization, especially the distribution of tasks and responsibilities, make it difficult to establish the degree of control that the shop-owner exercised over single chair designs. His influence over workmanship procedures and even
standardized designs does not necessarily imply his personal supervision over all of the furniture from his shop.

The little that can be said about the shop and about workmanship procedures reveals the presence of many components of nineteenth-century industrialization in their nascent form. Standardization, interchangeability, and specialization are all evident. However, the products of these mid-to-late eighteenth century furniture-making establishments cannot be likened further to those of succeeding generations: the scale of manufacture, both in its level of output and in its setting, was not at all equivalent. Nevertheless, the furniture of these makers was not the result of simple methods. To understand this work, it must be seen together with all of its links--from object to object, and from part to part.
NOTES: CHAPTER TWO

1 Hornor lists 70 joiners, cabinetmakers, and chairmakers taken from a Philadelphia tax list of 1783, and 97 from one made in 1786 (Hornor, Blue Book, pp. 317-26). Carvers, gilders, turners, and upholsterers are not included in these totals. Nancy Goyne Evans lists 170 names of "furniture craftsmen, journeymen, or apprentices, or others who may have produced furnishings at times" (Goyne, "Furniture Craftsmen," pp. 202-06. Arthur Leibundguth names 172 as being active in furniture production between 1730 and 1760 (Leibundguth, "Furniture Making Crafts," pp. 132-36).

2 Joseph Downs advanced a Maryland origin based on the "exaggerated scrolled ears and heavy members [that] indicate some provincial origin" and likened these features to chairs with known Maryland provenances. His discussion focused on the armchair to the side chair in question, which apparently had not yet been acquired by the Winterthur Museum. He described the other side chair as the "apex . . . in the use of fine carving and noted its Philadelphia origin (Joseph Downs, American Furniture: Queen Anne and Chippendale Periods [1952; reprint ed., New York: Viking Press, 1967], figs. 37, 38, 128). Helen Comstock's analysis of this same group of chairs followed suit (American Furniture: Seventeenth, Eighteenth, and Nineteenth Century Styles [New York: Viking Press, 1962], figs. 265, 266). The chairs are correctly identified with respect to their origin in Charles F. Hummel, A Winterthur Guide to American Chippendale Furniture: Middle Atlantic and Southern Colonies (New York: Crown Publishers, 1976), figs. 41, 65.

3 The strength of tradition is a theme developed by many writers on subjects of material culture. For a concise statement of the forces at work, see Kubler, Shape of Time, pp. 77-82.

4 Ibid., pp. 60-61, 71-72.

5 10 of the 100 chairs in the study used this construction technique. See Appendix E for frequencies of other design and construction features.
Of the 100 chairs in the sample, 19 (including the 4 in the Washington/Lambert group) had carved shoes. All but 4 of these chairs fell into distinct groups based on the use of the same splat templates. Two of the groups contained one additional chair that did not have a carved shoe. Distribution according to group is as follows: 4 out of 4 4 to 5; 3 to 4; 2 to 2; 1; 1; 1; 1.

Horaor, Blue Book, p. 216. He suggests that the chair was originally part of a set of eight.


Joseph Downs recognized this relationship in American Furniture, figs. 37, 38.

For other examples, 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; and Downs, American Furniture, fig. 119.


Glassie, Folk Housing, p. 21

Accounts beginning in 1768 show that shop-owner 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 "Carveing 8 chair backs" in 1796 (Golovin, "Daniel Trotter," p. 163); and in David Evans's account book under 12 March 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, Cabinet Maker: His Life and Work" [unpublished M. A. thesis, University of Delaware, 1954], p. 16).

Horaor, Blue Book, p. 197. A side chair at the Winterthur Museum is marked "XXI" (acc. no. 61.803.4).


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 the Winterthur Museum (60. 1066.1-.4). These four chairs are discussed further in Zimmermann, "Methodological Study," pp. 196ff., in which they are related to another set of Philadelphia Chippendale chairs that were not included in this study (see also p. 65, n. 47).

33 of the 100 chairs in the study were published with seat-rail heights in either Kane, *300 Years*, or Kirk, *American Chairs*. The measurements can be summarized as follows: 9 of the 33 were 17 inches; 21 were between 16-3/4 and 17-1/4 inches; and 30 were between 16-1/2 inches and 17-1/2 inches. The 3 remaining chairs had seat-rail heights of 15-1/4, 15-3/4, and 16 inches, and they were armchairs. In armchairs with seat rails the same height as side chairs, the front legs were sometimes made shorter to accommodate the more massive seat rails which were often up to an inch deeper. (See Appendix F for comparative measurements between side and armchairs.)

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).

The distinction between side chairs with arms and true armchairs is not apparent in personal estate inventories.

*Hornor, Blue Book*, p. 216.

fig. 44. It was probably among the "6 best Mahogany chairs & 2 arm chairs" divided in 1845 between two heirs of the original owner (Sweeney, Grandeur, pp. 101, 112). See also a memorandum from Philip D. Zimmerman to John A. H. Sweeney, 25 August 1976, in which these two chairs are discussed (Object Files, Registrar's Office, Winterthur Museum, filed by accession numbers 61.806 and 76.114.1-.3).

24 Slight variations between the splats of these two chairs disappear when the template is reversed. Obviously, the chair-maker inadvertently flipped the template between tracing the two splats.


26 Hornor, Blue Book, p. 104. See also pp. 127, 143, 165, 207-08 for references to furniture parts.

27 See inventories of Daniel Jones (16 June 1766) and William Davis (20 July 1767) transcribed in Goyne, "Furniture Craftsmen," pp. 207-10; and Timothy Hanson (18 December 1798), Ziba Ferriss (15-16 May 1796), and John Janvier (31 January 1801) transcribed in Hancock, "Furniture Craftsmen," pp. 203-06.

28 Samuel Williams's advertisements dated 9 September 1767, 12 June 1769, 2 June 1773, and 16 April 1783 are transcribed in Prime, Arts and Crafts, Vol. 2, pp. 198-99.


30 Ibid., p. 182. This entry was misread as "without through banister" in a transcription of the 1786 Lehman price list that duplicates the Tyler manuscript discussed by Weil. See Harrold E. Gillingham, "Benjamin Lehman, A Germantown Cabinetmaker," Pennsylvania Magazine of History and Biography, LIV:4 (1930), p. 295.

31 Montgomery, American Furniture, p. 16.

32 The status of the wage-earner in the furniture industry before the 1790s has not received much attention. For brief discussions covering the 1790s and later, see Montgomery, American Furniture, pp. 19-26; Weil, "Price Book," p. 175; and Kathleen M. Catalano, "Cabinetmaking in Philadelphia, 1820-1840: Transition from Craft to Industry," in Winterthur Portfolio 13, ed. Ian M. G. Quimby (Charlottes-

33 Weil, "Price List," p. 182. Hornor reported that claw feet were mentioned in accounts as early as 17 January 1745/6 (which he cites elsewhere as 1745) and 1748. See Hornor, Blue Book, pp. 38-39, 95.

34 DMMC, photostat, Ph18. Original at the Philadelphia Museum of Art.


36 Kirk, American Chairs, p. 7.

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

38 This date is meant to mark the beginning of the style period, but is not the first instance of Chippendale-styled furniture in Philadelphia. That distinction probably belongs to a high chest how at Colonial Williamsburg that is signed by Henry Cliffton and Thomas Cartaret and is dated November 4th(?), 1753 (Colonial Williamsburg, 1975.154).

39 1748 is the earliest reference given by Hornor (Blue Book, p. 194). Estate inventories are not helpful in this instance because they establish ownership only and do not indicate current use of or interest in the object.

40 See p. 129, n. 33. For Queen Anne chairs with claw feet, see Hornor, Blue Book, plates 79, 80, 82, 83. Plate 81 appears to be the same chair as Fig. 22.


42 The radical differences in the techniques used to make these two chairs precludes further comparison between them of their construction. Both, however, have an elongated shell on the knee. Although the square-seat chair is stylistically later than the compass-seat chair, this particular chair was not necessarily made after the other since the two chair designs overlapped in time.
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APPENDIX A: LIST OF CHAIRS IN THE SAMPLE

**Winterthur Museum** (53 chairs)

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<td>61.1188</td>
</tr>
<tr>
<td>57.666</td>
<td>59.3398</td>
<td>61.1194</td>
</tr>
<tr>
<td>57.667</td>
<td>59.3400</td>
<td>61.1196</td>
</tr>
<tr>
<td>58.1412</td>
<td>59.3421</td>
<td>61.1198</td>
</tr>
<tr>
<td>58.2255</td>
<td>60.149</td>
<td>61.1200.3</td>
</tr>
<tr>
<td>58.2258</td>
<td>60.1062.1</td>
<td>62.19.1</td>
</tr>
<tr>
<td>58.2262</td>
<td>60.1063.2</td>
<td>64.575</td>
</tr>
<tr>
<td>58.2680</td>
<td>60.1066.4</td>
<td>64.966</td>
</tr>
<tr>
<td>58.3091</td>
<td>60.1067.1</td>
<td>68.88.1</td>
</tr>
<tr>
<td>59.635</td>
<td>60.1073.1</td>
<td>71.593.1</td>
</tr>
<tr>
<td>59.785</td>
<td>61.116</td>
<td>76.114.1</td>
</tr>
<tr>
<td>59.1287</td>
<td>61.803.4</td>
<td></td>
</tr>
</tbody>
</table>

**Yale University** (18 chairs)

<table>
<thead>
<tr>
<th>Number</th>
<th>Number</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1930.2058</td>
<td>1930.2105b</td>
<td>1930.2498</td>
</tr>
<tr>
<td>1930.2060</td>
<td>1930.2117</td>
<td>1930.2499a</td>
</tr>
<tr>
<td>1930.2086b</td>
<td>1930.2242a</td>
<td>1930.2500</td>
</tr>
<tr>
<td>1930.2101b</td>
<td>1930.2479</td>
<td>1930.2501</td>
</tr>
<tr>
<td>1930.2102b</td>
<td>1930.2496</td>
<td>1930.2502</td>
</tr>
<tr>
<td>1930.2103</td>
<td>1930.2497a</td>
<td>1930.2530</td>
</tr>
</tbody>
</table>

**Boston Museum of Fine Arts** (9 chairs)

<table>
<thead>
<tr>
<th>Number</th>
<th>Number</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>27.605</td>
<td>39.169</td>
<td>41.602a</td>
</tr>
<tr>
<td>39.134</td>
<td>39.171</td>
<td>64.1899</td>
</tr>
<tr>
<td>39.168</td>
<td>41.601</td>
<td>no number</td>
</tr>
</tbody>
</table>

140
Philadelphia Museum of Art (9 chairs)

| 28.7.32 | 43.40.4 | 55.63.2 |
| 28.7.33 | 46.87.1 | 63.102.3 |
| 28.118.2 | 47.58.2 | 68.70.1 |

Colonial Williamsburg (6 chairs)

| 1930.180 | 1930.234.1 | 1962.233.6 |
| 1930.212 | 1959.267 | 1967.603 |

Metropolitan Museum of Art (4 chairs)

| 08.51.10 | 32.57.4 | 43.160 |
| 32.57.2 |

The White House (1 chair)

| 970.669.1 |

Total: 100 chairs
APPENDIX B: WORKSHEET AND EXPLANATIONS

OF WORKSHEET ENTRIES

Catalogue: If the chair was published in a catalogue, the publication and catalogue entry number were identified to serve as a convenient reference.

Accession #: Each chair was identified by its current accession number.

Location: Both the name of the institution and the current location of the chair in that institution were recorded.

General Description: Each chair was identified by its form (side or arm) and by any salient characteristics such as half-upholstery or conversion from one form to another. Impressed chair numbers were noted, as were labels or other notations attached to the chair.

Date/Range and Reason: Space for this information was provided with the expectation that chairs would be arranged chronologically within the Chippendale style period. This objective was not realized in this study, and the space remained unused.

Maker/Attribution and Reason: Like "Date/Range," this item was to be filled in during the later stages of the study. It too proved unfeasible, and the space was unused except in the rare instance of a known maker.

Wood Analysis: Since most of the chairs examined were made of mahogany, only primary woods of other kinds were noted. Distinctions between mahogany and walnut were made on the basis of microanalysis only because visual evidence alone is often unclear. Woods for most chairs in the study had not been microanalyzed, thus some uses of walnut were not recorded on the worksheets. Secondary woods were similarly not analyzed in most cases. Consequently, the usefulness of this item did not reach its potential.

Legs: The type of front foot was identified. The presence
## Philadelphia Chair Work Sheet

<table>
<thead>
<tr>
<th>Catalogue #</th>
<th>Accession #</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Location 

General Description 

Date/Range 
Reason 

Maker/Attribution 
Reason 

Wood analysis: Primary 
Secondary 
Microanalysis 
Visual analysis 

### LEGS

**Front Foot** 
Leg-knee 
Bracket 
__________ h __ 
__________ w __ 

**Rear Leg** 
Bracket 
__________ h __ 
__________ w __ 

### Stretcher

### SEAT

**Front rail** 
Pinned Yes No 
Shaping 
Molding 
Motif 
__________ h __ 
__________ h' __ 
__________ w __ 

**Side rail** 
Shaping 
__________ h __ 
__________ h' __ 
__________ w __ 

**Rear rail** 
Shaping 
__________ h __ 
__________ w __ 
__________ w' __ 

### STAY RAIL

Shaping 
Carving 
__________ h __ 

### BANISTER

Type 
Carving 
__________ h __ 
__________ w __ 

### CREST RAIL

Type 
Carving 
__________ h __ 
__________ l __ 

### POSTS

Decoration 

### ARMS

Type 
Attachment to arms 

---

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of an inside chamfer on marlborough legs was noted. Any decoration was described including that on the brackets (the shaped block of wood applied to the side of the leg and to the underside of the seat rail). The use of nails or screws to secure the bracket was not recorded because original work could not be distinguished from later repairs. Since most chairs had at least one replaced bracket, replacements were noted only when no original brackets survived to document the original form and decoration. One original bracket, usually the right side front, was measured at its maximum height and width.

The rear leg was described according to its sectional profile (see Fig. 7). Inside chamfers on marlborough legs were noted. The use of a through tenon, and in some instances a double through tenon, was recorded. The number and position of wedges set into the tenon to tighten it were also indicated on many work-sheets, but splits in the tenon, build-up of finish, and other evidences of age and use made an accurate tabulation of this data on all chairs difficult. No rear-leg brackets were found, and the space for this information was left blank.

Stretchers appeared only on those chairs with marlborough legs. The pattern of stretchers, which did not vary, was identified as an "H." The width of the wood stock used (identified as "height") was measured, as was the distance from the central cross member to the front leg. All chairs with stretchers had a stretcher connecting the rear legs and joined to them above the joint of the side stretchers. The presence of this element was noted by the term "rear."

**Seat:** Originally, only the presence or absence of pinning on the front rail was to be observed. This item was quickly amended to show the number of pins, and work-sheets already completed were changed to reflect this addition. The shaping of the rail was described in terms of hollows, ogees, and fillets recorded in their proper sequence. Unusual or complex designs were drawn in left margin. The type of molding used on the upper edge of all rails was noted in its sequence using a vocabulary of fillets and quarter-rounds. The central motif decorating the front rail was described and identified as being applied or carved. The length ("width") of the front rail was determined by measuring along the top edge. Its height was taken at one of the ends from the top of the bracket to the uppermost edge. When rails had been lightened, this second height, representing a minimum, was also recorded.
The side rail was described in the same fashion as the front rail. The number of pins securing the front and rear joints was recorded underneath the space allotted for "shaping."

Information for the rear rail was noted as before. In addition, the rail was described as flush, recessed, or blocked (see Fig. 8). Wood-laminations were recorded along with any other unusual treatments. For the few instances when the rear rail had been lightened, the additional measurement was written in the margin.

Stay Rail: The rear profile of the stay rail (called shoe in the text, see p. 65, n. 46) was described in terms of hollows (sometimes modified by shallow or tight), fillets, and quarter-rounds (sometimes overhanging). Any carving on the front was noted. The height and length of this part was measured. Finally, any unusual aspects, such as notching the stay rail into the posts, was described or illustrated.

Banister: Certain banister or splat designs that were easily identified with a descriptive term, like strapwork, Gothic, Gothic with cusps, and so forth, were recorded by name; the others were left unidentified. Carved motifs and their location were noted. The height of the banister was taken from the top of the stay rail to the juncture with the crest rail on the front. The width was taken at the maximum point.

Crest Rail: No descriptive terms were developed for this part; hence "type" was left blank. Carving was described in the same way as on the banister. The width was taken at the maximum point, as was the height. To get an accurate height measurement, a straight-edge was often used to establish an edge for the part that had been removed in decorating it. A pair of compasses were also used when the contours of the part prevented the effective use of a tape. Quarter-blocks (see Fig. 6) were noted when present.

Posts: The decoration was described using the terms found in Appendix C.

Arms: No "type" was established. Only the attachment of the arm to the post was identified, namely, an "armchair" or "side chair" post, in reference to the use of a nod- ule. If the arm was fitted into the post by cutting away a channel, that too was noted.
APPENDIX C: POSSIBLE VARIATIONS IN THE DESIGN OF REAR POSTS

SIDE CHAIR POST

Plain   | Molded   | Beaded   | Fluted   | Carved
--------|----------|----------|----------|--------
plain   | inside   | outside  | both     |        
bead    | bead     |          |          |        
three   | four     | flutes   | flutes   |        
stop-   | stop-    | fluting  | fluting  |        
lozenge | vine      |          |          |        
other   |          |          |          |        
with    | without  | with     | without  |        
beads   | beads    | beads    | beads   |        

ARMCHAIR POST

same as interrupted discontinued
side chair at arm under arm
APPENDIX D: CHAIR GROUPS WITHIN THE SAMPLE

Table 1: Splat Duplications (Workmanship of Certainty)

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<thead>
<tr>
<th>(*)</th>
<th>Winterthur</th>
<th>59.1331</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Winterthur</td>
<td>59.1329</td>
</tr>
<tr>
<td></td>
<td>Metro. Mus.</td>
<td>32.57.2</td>
</tr>
<tr>
<td>Boston MFA</td>
<td>39.168 (also Winterthur 59.1330)</td>
<td></td>
</tr>
<tr>
<td>Boston MFA</td>
<td>39.169</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(*)</th>
<th>Winterthur</th>
<th>59.1288</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Winterthur</td>
<td>58.2262</td>
</tr>
<tr>
<td></td>
<td>Boston MFA</td>
<td>39.171</td>
</tr>
<tr>
<td>Yale Univ.</td>
<td>1930.2117</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(*)</th>
<th>Winterthur</th>
<th>61.1198</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boston MFA</td>
<td>41.601 (also Metro. Mus. 32.57.3)</td>
</tr>
<tr>
<td></td>
<td>close to:</td>
<td>Phila. Mus. 43.40.4 (.3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phila. Mus. 28.7.33 (.4, .30-.31, .34-.35)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phila. Mus. 28.7.32 (.2-.3, .5, .35)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(*)</th>
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<th>59.1327</th>
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</thead>
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<tr>
<td></td>
<td>Col. Wmsbg.</td>
<td>1930.234.1 (.2)</td>
</tr>
<tr>
<td></td>
<td>close to:</td>
<td>Winterthur 59.1328</td>
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</tbody>
</table>

<table>
<thead>
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<th>(*)</th>
<th>Winterthur</th>
<th>58.2258 (58.2257)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Winterthur</td>
<td>58.3091 (also Phila. Mus. 40.16.5)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(*)</th>
<th>Winterthur</th>
<th>59.3394 (59.3391)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Phila. Mus.</td>
<td>47.58.2 (.1; 40.16.73-.74)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(*)</th>
<th>Winterthur</th>
<th>61.803.4 (.1-.3; also Yale Univ. 1930.2104)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yale Univ.</td>
<td>1930.2102b</td>
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<table>
<thead>
<tr>
<th>(*)</th>
<th>Boston MFA</th>
<th>41.602a (b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yale Univ.</td>
<td>1930.2101b</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>(*)</th>
<th>Winterthur</th>
<th>59.3400 (59.3399)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yale Univ.</td>
<td>1930.2499a (also b with minor variation)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(*)</th>
<th>Winterthur</th>
<th>60.1066.4 (.1-.3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metro. Mus.</td>
<td>08.51.10 (with horizontal strip removed from the middle of the splat)</td>
<td></td>
</tr>
</tbody>
</table>
(*) Winterthur 59.3390 (also Col. Wmsbg. 1930.173.1-.2)
   Yale Univ. 1930.2060 (with slight vertical compression)

(*) denotes chair from which template was drawn

Table 2: Other Construction Features (Workmanship of Habit)

<table>
<thead>
<tr>
<th>Winterthur 58.2258 (58.2257)</th>
<th>Winterthur 58.3091 (also Phila. Mus. 40.16.5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>add: Winterthur 58.2255</td>
<td>add: Winterthur 58.2256</td>
</tr>
<tr>
<td>Winterthur 61.1198</td>
<td>Boston MFA 41.601 (also Metro. Mus. 32.57.3)</td>
</tr>
<tr>
<td>add: Winterthur 61.1196</td>
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</tbody>
</table>

Table 3: Summary of Chair Features Within One Group

<table>
<thead>
<tr>
<th></th>
<th>Wint. 59.1329</th>
<th>Wint. 59.1331</th>
<th>Phila. 32.57.2</th>
<th>Boston 39.168</th>
<th>Boston 39.169</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rounded rear feet</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Rounded w/ straight</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sides</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chamfered</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Blocks or recessed</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>rear rail</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flush rear rail</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identical shoe</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>template</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carving on shoe</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>(81 of 100 were not</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>carved)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identical height of</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>seat rails</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front rail pins:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 pin</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>2 pins</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>no pins</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>59.1329</td>
<td>59.1331</td>
<td>32.57.2</td>
<td>39.168</td>
<td>39.169</td>
</tr>
</tbody>
</table>

Side rail pins:
- 2 pins front & rear
- 1 front, 2 rear
- 1 front, 0 rear (6 other combinations)

Rear rail pins:
- 2 pins (2 other combinations)

Front rail shaping:
- Hollow
- Hollow w/ fillet (3 other possibilities)

Five-lobed shell

Seven-lobed shell

Side rail shaping:
- Hollow w/ fillet & ogee w/ fillet
- Hollow & ogee w/ fillet (2 other possibilities)

Rear rail shaping:
- Hollow w/ fillet
- Hollows only (95 of 100 were not shaped)

3 flutes on posts

4 flutes on posts

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APPENDIX E: FREQUENCY OF SOME DESIGN AND CONSTRUCTION FEATURES WITHIN THE SAMPLE

<table>
<thead>
<tr>
<th>Feature</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front legs:</td>
<td></td>
</tr>
<tr>
<td>Trifid foot</td>
<td>4</td>
</tr>
<tr>
<td>Claw foot</td>
<td>81</td>
</tr>
<tr>
<td>Hairy paw foot</td>
<td>2</td>
</tr>
<tr>
<td>Scroll foot</td>
<td>1</td>
</tr>
<tr>
<td>Marlborough</td>
<td>12</td>
</tr>
<tr>
<td>Rear legs:</td>
<td>100</td>
</tr>
<tr>
<td>Rounded</td>
<td>82</td>
</tr>
<tr>
<td>Rounded with straight sides</td>
<td>5</td>
</tr>
<tr>
<td>Chamfered</td>
<td>3</td>
</tr>
<tr>
<td>Squared</td>
<td>10</td>
</tr>
<tr>
<td>Single through-tenons</td>
<td>89</td>
</tr>
<tr>
<td>Double through-tenons</td>
<td>4</td>
</tr>
<tr>
<td>No through-tenons</td>
<td>7</td>
</tr>
<tr>
<td>No pins visible in seat-frame joints</td>
<td>16 (of 100)</td>
</tr>
<tr>
<td>Quarter-blocks in crest rail</td>
<td>10 (of 100)</td>
</tr>
<tr>
<td>Shoe notched into rear stile</td>
<td>13 (of 100)</td>
</tr>
</tbody>
</table>

150
APPENDIX F: MEASUREMENTS OF SELECTED CHAIR PARTS

The following tables record measurements of each of the chairs in the sample. They are designed to show 1) the variation in size among Philadelphia Chippendale chairs, and 2) the typically larger scale of armchairs relative to side chairs. (2 side chairs that once had arms are recorded as side chairs.)

Table 1:
BANISTER and CREST RAIL, or CHAIR-BACK HEIGHT

Values not recorded: 0, 25-1/4; ©, 26-7/8; ø, 29-3/8

|      | 0  | 0  | 0  | 0  | O  | O  | O  | O  | O  | O  | O  | O  | O  | O  | O  | O  | O  | O  |
|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---
Table 2:

Values not recorded:
Θ, 22-1/8; Θ, 25-3/8

Table 3:
CREST RAIL LENGTH

Value not recorded:
Θ, 26

KEY: 0 = side chair; Θ = armchair
Table 4: SIDE RAIL*

Table 5: FRONT RAIL*

KEY: 0 = side chair; © = armchair

* One chair with upholstery over the seat rails is omitted.