Towards a Material History Methodology

Introduction

During the academic year 1983-84, a graduate history seminar at the University of New Brunswick in Fredericton attempted to construct a methodology for the analysis of artifacts.[1] This was the first seminar in what would become the Diploma Programme in Material History offered in conjunction with the M.A. Programme in History at the university.[2] The course was taught by Dr. Stuart Smith of the Department of History whose creative leadership provided the climate for group discovery which has resulted in this report.

The article has been divided into three sections: a description of the class process in developing a methodology and research model; the research model described; and a test case application of the methodology using a sample artifact. No attempt has been made to integrate this line of inquiry within the broader questions posed by the discipline of history. Rather, it is presented as an end in itself and, as such, will hopefully serve as a useful catalyst for discussion and a departure point for those interested in material history and the analysis of artifacts.

The Class Process

The search for a workable methodology began with a general, surface investigation of several past cultures and attitudes held towards the object in those cultures. This process was repeated, more or less, when a number of social science disciplines were examined and their relationship with material evidence measured. Of this group, archaeology appeared the closest methodological link to the class objective in view of its basic procedure of commencing investigation with the object, a direction no doubt born of necessity because of the paucity of other forms of evidence available in the course of the archaeologists' work. In spite of or perhaps because of this factor, the seminar adopted archaeology's initial stage of scientific description of material evidence as a core philosophy.

Equipped with this outlook the class then began to digest and qualify a number of methodological proposals contained in pertinent literature that attempted to formulate a line of enquiry for the analysis of artifacts. Two of the more promising models appeared in recent issues of the *Winterthur Portfolio* – E. McClung Fleming's "Artifact Study: A Proposed Model" and Jules Prown's "Mind in Matter: An Introduction to Material Culture Theory and Method".[3] Aspects of Fleming's methodological framework were in fact altered and adapted in a generalized sense for use in a preliminary class model emphasizing several basic properties of the object. Fleming's basic artifact properties included History, Material, Construction, Design and Function. To each of these he applied four analytical operations: Identification (factual description), Evaluation (judgements), Cultural Analysis (relationship of the artifact to its culture) and Interpretation (significance).

Upon reflection, the class decided to reduce the perceived complexity of this framework by abandoning the four analytical operations and creating a cleaner, basic model with aspects of Fleming's methodology intact. History, for example, was omitted as the initial artifact property and replaced by Material, a move that seemed consistent with the archaeologist's method of beginning analysis with the artifact. Next, as in Fleming's model, Construction (including physical description) would be considered followed by Provenance (History). Design was eliminated in the belief it would be incorporated by Construction and other elements of the model and therefore did not warrant separate classification. Function was viewed as essential to determine the artifact's use and what implications, if any, were intended or unintended through that use. Finally, a property termed Value was added to the basic framework. This was seen as the most interpretive portion of the model despite its shallow monetary connotation. Aside from the price an object might bring in a contemporary auction setting or the consideration of its purely aesthetic value, this property represented a more complex level of analysis and was related, in large part, to the object's cultural associations with, and perceived value to, the society in which it was produced. At the same time, it was recognized that an artifact's value could be interpreted differently by a range of observers from its point of creation to the present day.

Material, Construction, Provenance, Function and Value thus formed the seminar's core model. These properties would be considered as listed, an order that anticipated the examination of an artifact as the starting point of analysis before the consultation of supplementary source material. The arrangement of the properties also reflected a gradual shift from the more empirical observations gained in Material and Construction to the largely interpretive property of Value.

The seminar viewed the basic model structure as a necessary retreat from Fleming's more complex proposal, which it felt attempted to synthesize too much information from several sources too early in the investigation procedure. Class members did note that their model might itself develop further through discussion and testing but anticipated a slower, more controlled evolution to the interpretive aspects of artifact analysis.

A more central question confronting the seminar at this point, however, was the model's adaptability. Could a broad range of artifacts be approached using this line of enquiry or was it necessary to develop separate methodologies for different categories of artifacts? Indeed, was it even necessary to categorize artifacts for analytical purposes? Jules Prown, in his article, felt that artifact categories were useful because of the broad range of material produced or modified by man. He based his classification system on function and listed several categories which progressed from the decorative to the utilitarian (i.e. Art, Diversions, Adornment, Modifications of the Landscape, Applied Arts and Devices).[4] Proceeding from this arrangement, he proposed a methodology in which direct contact with the artifact would be established using the analytical stages of Description, Deduction and Speculation followed by a programme of research designed to validate these stages by considering external forms of evidence. That evidence would be gathered through a variety of methodologies and techniques developed by established disciplines (i.e. social history, cultural geography, social anthropology, etc.).[5]

Prown emphasized that these methodologies should not be applied until the artifact itself was thoroughly analyzed, a direction supported by the seminar. At the same time, however, it was noted that Prown's model could be tightened considerably, particularly the Speculation stage, which involved the formulation of theories and hypotheses based primarily on physical evidence. The seminar viewed these processes as having application near the end of the investigation and felt that Prown proposed their introduction too early with less effect. If anything, Prown relied too much on physical evidence, posing questions it could not answer. In addition, his system of artifact classification appeared, without testing, to be redundant and potentially harmful to the investigation process. Once a group of artifacts were categorized, for instance, they might receive questions not asked of artifacts in other categories and vice versa. This perceived diversity was thought dangerous to the seminar's desire for a flexible research model. It was instead decided to test the class approach on a sample artifact chosen by each student for analysis, an exercise that would hopefully serve to indicate if the model required any alterations.

The initial test produced some interesting results, as well as several problems, and ultimately, the need for an expanded model format. The examination of the assigned properties of each artifact produced a number of instances in which the hands on approach applied in Material and Construction yielded observations contradicting held assumptions. For example, a bowler hat's material composition, component parts and their assembly, revealed moulded cardboard as a base material with a circle of wire beneath the brim to help maintain the hat's shape. The seminar member who examined the hat had always assumed that bowlers were made primarily of felt, but these new findings contributed directly to subsequent observations regarding the hat's perceived value to the society in which it was produced.

Next, during consideration of Provenance as an artifact property, a British army sword was presented and the question posed as to whether it had ever been used in a major historical event such as the War of 1812. In discussing this matter it was eventually agreed that the sword's individual history and connoisseurship were less important than its more general connections to the era in which it was produced. If swords like the example presented were used during the War of 1812, then study of that artifact would likely reveal certain conclusions about the general nature of warfare at that time. The sword's property of Function, beyond its implied basic use, would consider the weight of the weapon and its place in a soldier's pack. Did it in fact retard movement? Was it awkward to swing in use, etc.?

The properties of Function and Value were confirmed as being more productive in an interpretive sense than expected. Value, in effect, was seen as the collection point for the buildup of information through the preceding stages. Hence, for example, elements of the bowler hat's construction technique contributed to observations regarding the values of the society that produced and used this form of head wear (uniformity, durability, formality, etc.).

While seminar members felt that the model performed reasonably well during this run-through, a number of problem areas were discovered. The gradual buildup of information through the artifact properties, although seen as essential, also created uncertainty in some cases as to where one property ended and the other commenced. Function seemed to flow into Value and elements of Provenance became confused with Function. In addition, the exact time and place for the introduction of supplementary data remained unclear. This included comparative data derived from objects similar to the artifact under consideration as well as documentary and other evidence in support of (or contrary to) information revealed to the observer through the hands on approach encouraged during Material and Construction. In the course of the presentations, seminar members usually began introducing supplementary data during Construction after having made initial observations derived from a direct examination of the artifact. A mixture of observable and supplementary evidence then continued through the remainder of the properties from Provenance to Value.

Finally, an area of major concern developed regarding the perception that some artifacts yielded more information than others when treated by the model. A number of seminar members subsequently proposed that time could thus be spent more profitably analyzing artifacts of higher information value. Others, however, felt this point of view seemed reminiscent, in some respects, of Prown's artifact categories and their progression from the decorative (aesthetic) to the primarily utilitarian. To Prown, ultimately, the decorative/aesthetic dimension of objects as embodied primarily in fine art, architecture and the applied arts resulted in greater communication value between the observer and the original producing culture

than the more utilitarian artifacts, which he referred to as devices.[6] As an art historian it was felt, perhaps unfairly, that Prown had advanced his opinion because of his professional background. Yet the core of his argument confirmed the seminar's observation that the analysis of some artifacts was more profitable than others, whether this conformed to Prown's aesthetic-utilitarian construct or not. After much discussion, it was ultimately decided to abandon a scale of artifact information value since questions raised through the application of the mode were seen as equally valid whether applied to a mid-nineteenth-century hammer or a late eighteenth-century landscape painting. The landscape might yield more information about the culture that produced it, but if the hammer was not questioned at all, potentially useful information might be lost. In addition, any test of the model's flexibility would be skewed in one direction.

Although this issue was resolved, earlier concerns regarding the lack of a clear division among the model's artifact properties and the place of introduction of supplementary data seemed to indicate a need for structural change. A partial answer to these difficulties came during one of the final class presentations in which a nineteenth-century firearm was analyzed by applying a series of three general question categories to each artifact property in turn, from Material to Value. These categories each contained very general standardized questions in view of the broad range of artifacts the model would conceivably seek to analyze. For the sake of convenience, these were labelled *A*, *B* and *C*, where questions marked *A* involved those that could be answered through direct observation of the artifact, *B* those that could be answered through comparisons with similar artifacts, and *C* when supplementary evidence such as printed or written sources were consulted. In addition, a final non-question category, labelled *D*, was created for the formulation of conclusions derived from the preceding questions.

This standardized format appeared to give each artifact property more definition through the application of an ordered series of question categories. Introduced in turn to Material, Construction, Provenance, Function and Value, the *A*, *B* and *C* questions also served as a guide for the timing and use of observable, comparative and supplementary data. Given the fact that most seminar presentations to that point had attempted to answer unordered questions of no particular type, the most recent approach was seen as a promising direction.

As the autumn term ended, further development occurred when it was proposed that the model might achieve greater clarity if represented in graphic format. This was suggested in the shape of a grid system which would contain the five artifact properties along its vertical dimension and the three question categories and conclusions along the horizontal dimension (see Table 1).

Table 1
Graphic Representation of Model

	Observable Data	Comparative Data	Supplementary Data	Conclusions
Material				
Construction				
Provenance				
Function				
Value				

When the next term commenced, the seminar continued its examination of the proposed model. After considerable reflection and discussion it was eventually realized that the methodology, though heading in the right direction, exhibited problems and required additional modification. The existing procedure of examining an artifact through each of its properties in succession meant, for instance, that material composition was subjected to three groups of question categories and a set of conclusions derived therefrom before the property of construction was considered, and so on. In effect, the model did allow for the accumulation of knowledge about an artifact but did so at a tedious rate with a repetitive, rigid manner.

A solution, suddenly proposed, was simply the rotation of the grid system to one side. Rather than gathering all available data (observable, comparative and supplementary) for a single property before proceeding to the next, it was now suggested that observable data be recorded for all properties before moving on to the comparative process. After comparative data was acquired, the researcher could proceed to an examination of supplementary sources. It was further proposed during discussion that the conclusion categories be amalgamated to form one unit at the base of the model configuration in the interests of efficiency. Finally, the order of two artifact properties, Provenance and Function, was reversed so that Function would henceforth be considered before Provenance in each of the three question categories. This was proposed because Function entailed a greater reliance on observable data than Provenance and thus conformed to the general procedure of considering this form of evidence as early as possible within the model construct (see Table 2).

Table 2
New Model Configuration, Rotating Grid of Original

	Material	Construction	Function	Provenance	Value
Step 1 Observable Data					
Step 2 Comparative Data					
Step 3 Supplementary Data					
Step 4	Conclusions				

The new orientation appeared more logical and less rigid than its predecessor but required testing to determine if it contained inconsistencies. To that end, seminar members were once again instructed to select an artifact for analysis and to ensure, if possible, that a variety of man-made objects were represented in that selection. If the model was able to accommodate these disparate items successfully, it would demonstrate a universal and flexible application in terms of artifact research. Selections included a tea caddy, caulking mallet, lithographic prints, a pressed-glass goblet, a piece of lace, a Pembroke table, architectural drawings and a Bricklin automobile.

This exercise involved more research and preparation time than the first round of enquiries in the autumn and resulted in some fairly detailed papers. As these were presented, however, it became clear that the class was not in complete accord regarding the methodology. What had inspired agreement and seemed a logical structure and progression in theory did not always find adherence in practice. Some members had not followed the proposed methodology and several felt that the model remained too rigid, unduly complicating the researcher's progress by preventing freedom of movement within its structure. Others disagreed, believing that the method as developed forced the examiner to adopt an orderly approach to artifact analysis. This would permit other researchers easy access to recheck the data and conclusions and thus form a retraceable system.

While the concept of a retraceable analysis procedure did find agreement, debate continued over the methodology's perceived rigidity. This was manifested primarily in the fact that some had introduced documentary sources into their research before a complete examination of the artifact had been attempted. A number of seminar members felt this missed the point of the model and its indicated progression. It was their opinion that examination of the artifact by itself was essential before consultation of other sources if preconceived notions regarding objects were to be avoided and inconsistencies discovered.

The seminar presentation analyzing a Bricklin automobile was advanced as a case in point. It was noted that available documentation, including a Bricklin Vehicle Corporation press kit, advertised the safety aspects of the automobile.[7] Yet, upon initial examination of a Bricklin, it was discovered that no handles existed on the outside of its doors to release the latches. This might present a serious problem during an emergency if the occupant were incapacitated and a potential rescuer were forced to lose valuable seconds gaining entry by other means. The seminar member who gave the presentation felt that this example appeared to justify the adoption of the analysis procedure as developed.

While a consensus on this issue was not established during class presentation, other aspects of the methodology were refined. A general checklist of questions in their appropriate categories continued to be developed over the course of the spring term and were applicable to a wide range of objects. The checklist was expected to be a guide only, and it was recognized that some of the questions could not elicit a response at any particular step in the analysis procedure. Thus, while the answers to some questions were commonly found during one particular level of investigation (i.e., during comparative analysis), the data to answer others might be discovered in any one of the information-gathering steps. This depended entirely on the nature of the object under examination. It also remained true, as established earlier, that the amount of information that artifacts might convey to the researcher could vary widely and that some questions presented in the checklist might remain unanswered.

Many of the questions encouraged the researcher to look for evidence of cultural expression in the object since this fusion had been well established early in the seminar's investigations. It was also advanced that the researcher should re-examine the artifact after the initial hands on stage, especially if new information became available through comparative data or documentary evidence that would help the analysis of the object's properties more fully. Indeed, though insistence remained that the artifact must be examined by itself during the opening steps of the analysis process, it was agreed that any single source of information could prove misleading and all available evidence should be consulted. Some felt that the methodology represented or reinforced a state of mind consistent with artifact research. Rather than succumbing to the temptation of consulting printed or written works when confronted with an unknown object, it was stressed that the material historian must develop a grammar in order to read the artifact. Use of the model would hopefully encourage this development and thus alleviate the charge of rigidity in its application.

As the spring term neared its conclusion, the seminar appeared satisfied that the analysis model was capable of handling a broad sample of artifacts ranging from the complexity of a Bricklin automobile to the relative simplicity of a caulking mallet. (Note: an analysis of a caulking mallet appears later in this paper.) In addition, the model

formed a retraceable line of inquiry combined with an accessible overview of the entire analysis procedure. Thus, while disagreement on individual aspects of procedure remained, a general mental construct had been fashioned which, at least, could serve to reduce the researcher's preconceptions of an artifact's meaning. Its ultimate value, of course, would only be determined by continued testing.

The Model Described

The proposed analysis method encourages the historian to discard, as much as possible, preconceived notions about the artifact under study and to begin by studying the artifact itself. The investigative procedure suggests that the researcher perform a detailed examination (which may be either a written or a mental exercise) of the artifact before proceeding to other sources of information. After all observable data has been gathered, the examiner is directed to compare the artifact with objects similar to the one being analyzed. Other sources of information (documents, etc.) are introduced as supplementary data only after a complete examination has been made of the artifact and similar objects. At any stage during the process, the historian is able to re-examine the artifact, especially if new information becomes available that would help to analyze the object's properties more fully. The final step in the analysis procedure is to draw conclusions based upon all observable, comparative and supplementary data. At this point, contradictory evidence might be recognized and hypotheses formulated to explain these contradictions.

During each phase of the information-gathering process, the historian is seeking data from specific sources. The types of data are defined:

Step 1. Observable Data

Data that can be determined through sensory engagement with the artifact beginning with material composition, then construction, function, provenance and value.

Step 2. Comparative Data

Information acquired by comparing the artifact with similar (or identical) objects produced by the same maker or by other manufacturers during the same time period. Comparisons made with similar artifacts produced by the same manufacturer or different manufacturers over a period of time either before or after the artifact in question was produced. Comparisons with contemporary objects similar in function (if not design). Such comparisons move from material composition through to value.

Step 3. Supplementary Data

Generally written or printed sources of information that are seen as useful in supplying additional data concerning the properties of the artifact. Any other form of evidence (i.e., oral history, photographs of artifacts) consulted outside of the artifact itself and others like it (or dissimilar to it).

Table 3
The Analysis Method

	Question Categories				
Analysis Procedure	Material	Construction	Function	Provenance	Value
Step 1 Observable Data (examination of the single artifact)					
Step 2 Comparative Data (comparisons made with similar artifacts)					
Step 3 Supplementary Data (other sources of information introduced)					
Step 4	Conclusions				

A Checklist of Questions

Each of the steps outlined in the analysis method is subdivided into five categories or broad areas of inquiry (material, construction, function, provenance and value). General questions, which apply to a wide range of very different objects, have been developed for these categories or artifact properties. Since the material historian is primarily interested in what an artifact can reveal about the culture that produced it, many of the questions encourage the researcher to look for evidence of cultural expression in the object. The generalized questions are meant to be used as a guide or checklist for the examiner throughout the entire research process, while gathering all observable evidence from the individual artifact, through the comparative analysis phase, to the use of available supplementary data. The questions on the following pages do not represent an attempt to produce a definitive list. They are only offered as a guide for the researcher during the examination process.

During the examination of a variety of entirely different artifacts, it becomes obvious that many of the questions are not always answerable at any particular step in the analysis process. While the answers for some questions are commonly found during one particular level of investigation (for example, during comparative analysis), the data to answer others might be discovered in any one of the information-gathering steps. It depends entirely on the nature of the object under examination. It is also true that the amount of information artifacts are capable of conveying to the researcher varies widely, and therefore, some of the questions presented in the checklist may remain unanswered.

Material

The natural, organic and/or man-made materials composing the artifact and completing its appearance. Also the investigator's sensory response to the use or occurrence of those materials in the artifact.

1. What materials were used to produce the artifact and complete its appearance? (Quality of materials used?)
2. Did the materials used influence the object's final form?
3. Are these materials used in similar artifacts?
4. Where did the unworked materials originate?
5. Do the materials employed suggest trade patterns/ practices?

Construction

The methods employed to produce the artifact (or, if completely natural and/or organic, the methods used to physically arrange such materials for the physical or mental benefit of man). A physical description of the artifact's appearance to the observer and the qualitative intuitive judgement of the piece as viewed by itself, and later, in comparison with others like itself.

1. How was the artifact fabricated and finished? (a detailed examination including texture, size, etc.)
2. What construction methods (and tools) would be required to produce this artifact? (Handmade/ machine made? Quality and complexity of construction?)
3. How was the object's appearance affected or influenced by the construction techniques employed?
4. Is any form of ornamentation/decoration present? If so, what type?
5. How does this ornamentation/decoration affect the artifact's appearance?
6. Are any markings or inscriptions present?
7. Are there any signs of wear or repair?
8. Does the construction of this artifact differ greatly from similar objects? (objects by the same maker and others)
9. Is its design comparable to like objects? (Is the overall design a set style?)
10. What stage of development or evolution does this artifact represent when compared with both older and more recent objects of a similar type? (Does the design aid in dating?)
11. What degree of sophistication is represented by the artifact? (style, method of construction, etc.)
12. Is the artifact a reproduction?

Function

The reason(s) for the artifact's production and the use that was made of it. Its effectiveness for the role intended, including attendant social function whether intended or not.

1. Why was the artifact produced?
2. What function did this artifact perform?
3. How well did the artifact perform its intended function?
4. Was the object's functional performance affected by its design, materials used, construction methods employed or the ornamentation applied? (Do any of these hinder or reduce the artifact's effectiveness?)
5. Does the artifact's function reveal anything about its maker/owner?
6. What is its function today and has its function changed?

Provenance

The artifact's geographic place and time of origin, its maker or arranger (if naturally occurring such as a walkway made of flagstone), its owner if different from the maker and its history, including alterations or evolution from its point of origin to the present. The design of the artifact, including that represented through the artifact's content as articulated through observable data, comparisons with other artifacts, both similar and dissimilar, and the use of supplementary data.

1. Where and when was the object produced?
2. Who was the maker?
3. Where and how was the artifact used?
4. Who was the original owner of the object?
5. When and where did the original owner live and what was his social status, trade, etc.?
6. Who were the subsequent owners and where? Plus any other information on the object's history, owners, and maker(s), etc.

Value

The artifact's value to its original producer and/or owner. Its value (if any) to its contemporary society in terms of the cultural values it depicts through observable evidence, comparisons with others like it and supplementary data. Its value as determined by subsequent owners, caretakes, etc.

1. What was the artifact's value to its original owner?
2. Did ownership of this type of artifact reflect the social or economic status of the original owner?
3. What value was placed on the object by society?

4. What cultural values does it reveal?
5. What value does the object have to the society in which it was produced? (extrinsic/monetary)

The Method Applied

Even though, for this example, the analysis procedure has been written, the proposed analysis method may be performed as either a mental or written exercise. It is an approach for artifact analysis. The procedure is meant to encourage the researcher to examine the artifact more closely for observable data before relying on documentary sources. Naturally, the amount of information that may be extracted from an artifact depends heavily on that object (plus the examiner's observation skills and background knowledge).

The secret to gaining as much information as possible from an artifact rests in the interdisciplinary nature of material history studies and the observation powers of the examiner. A wide variety of relevant sources may be drawn upon to fully analyze and understand the artifact. For example, specialists from other disciplines may be able to answer questions concerning the artifact's structure or composition that few historians could answer.

Although an artifact of relatively simple construction (a nineteenth-century caulking mallet) is examined on the following pages, the analysis procedure has been tested on a wide selection of different objects; several were very complex. For the sake of brevity, this particular test case has been abbreviated and footnotes and a bibliography have been omitted.

Step 1: Observable Data

Material

The artifact is composed principally of hardwood with iron as a secondary material. Both the handle and the head of the implement appear to be made from the same type of wood, probably live oak (*Quercus virginiana*), although the handle may be of locust wood, possibly honey locust (*Gleditsia triacanthos*). (A hardness test was used to determine that the head of the object is live oak. More detailed analysis would prove whether the handle is locust wood or another hardwood species.)

Two other materials are present: a short length of rope and a small quantity of light cardboard.

Construction

The artifact weighs about 1.5 kg (3 pounds). It consists of a head or striking portion of live oak, 30.5 cm long with a circumference ranging from 15 cm to 18 cm in the middle area where the handle joins the head. The joining of the handle to the head gives the object a T-shaped appearance. The ends of the head, as previously mentioned, are smaller in circumference than the middle section, measuring 15 cm for a distance of 10 cm from one end and 9.5 cm from the other. A thicker area in the middle of the head, for a length of 10 cm, is 18 cm in circumference. A tapered hole, around 2.5 cm in diameter, of oblong shape nearly bisects the head. The handle measures 37 cm long and is consistently 10 cm in circumference with the exception of a slight tapering that begins 10 cm from the end inserted into the head of the implement. A 1-cm hole has been drilled 2.5 cm from the end of the handle to admit a short length of rope (about 30 cm long) which has been spliced to form a loop.

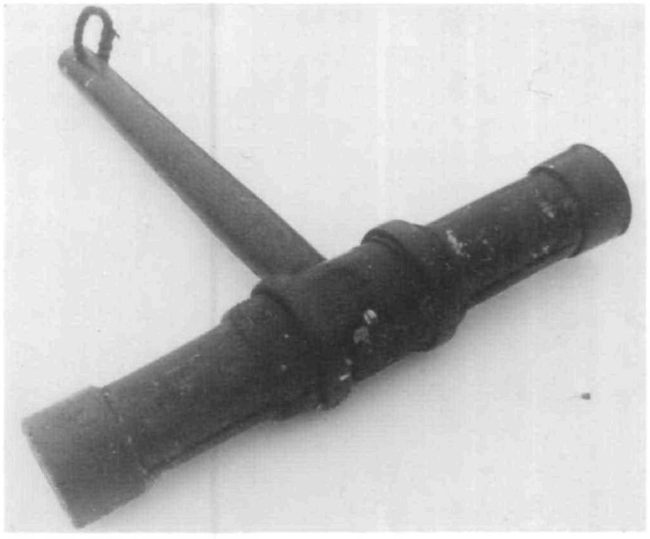

Fig. 1. Caulking mallet originally owned by William Heans (1831-1912) and used during the construction of the yacht *Canada*. (Courtesy: Howard F. Heans.)

Thin iron bands have been driven over the centre portion of the head to either side of the handle. These metal rings measure 1.2 cm wide and 0.3 cm thick. Tapering iron bands are located at either end of the head having been driven to the full width of the metal to the point of being flush with the wood at each extremity.

Narrow slots about 8 cm long and 0.3 cm wide have been cut entirely through the head in a longitudinal fashion in the area of the head to either side of the handle. One slot runs very nearly to the metal ring on one end of the head, while the other actually extends under the tapering iron at the other end. A 0.6-cm hole has been drilled through each slot and centred 2.5 cm from each narrow iron ring near the handle. Between each iron ring and the wood of the head is a light cardboard substance, apparently to help lodge the rings in place. A small quantity of packing is visible where the handle has been spread somewhat to prevent the head from slipping off.

One iron ring (at the end of the head) is misshapen from use and the fact that one end of the head is slightly shorter than the other indicates uneven use. Numerous gouges, scratches and paint spots are visible on both metal and wood surfaces. The striking surfaces on either end of the head exhibit relatively little wear and the tool is still in fairly good condition.

The skills of two main craftsmen were required to produce this artifact. The iron rings were made in an iron foundry, while the wooden handle and head were produced by a woodworker who also might have assembled the implement. Since the artifact is of relatively simple construction, implements of this type could possibly be mass-produced very easily.

Function

The wear marks on either end of the head clearly indicate that the object is a tool used for striking. (Unless the examiner was familiar with caulking mallets and the operations required to caulk a wooden ship, the artifact's actual role would not be apparent.) Being constructed of hardwood and iron the implement has considerable heft, weighing about 1.5 kg. The head, being slightly loose, detracts somewhat from the feel of confidence one would otherwise have in swinging the tool. One can easily adjust the force of the blow due to the implement's balance which is sufficiently heavy to enable the person employing the tool to use its heft to advantage or, on the other hand, check its force of impact with relative ease.

One might also assume, because the tool does not have any applied ornamentation, that the artifact was originally produced for a purely functional purpose. The wear marks and general condition of the tool are consistent with this conclusion.

The size and shape of the tool show that it can be used by only one individual at a time.

Provenance

The provenance of this particular artifact cannot be determined from the object. Maker's marks and other data that would allow the examiner to formulate general conclusions concerning the tool's place and date of origin are not present. However, the use of iron rather than steel for its metal hardware probably indicates that the tool was produced prior to the twentieth century if given a North American origin.

Value

Although we may assume that the tool was relatively inexpensive to purchase or produce because it is of simple construction, this cannot be determined with absolute certainty.

The functional nature of the tool seems to indicate that the individual using it would only value the implement for the task(s) which it could perform.

Step 2: Comparative Data

Material

When comparisons were made between similar implements, it was found that many had heads composed of live oak, while others were made from lignum vitae (*Guaiacum officinale*). A significant number of the artifacts examined had locust wood handles, but other species of hardwood were also used to produce the heads and handles for this type of tool. A number of early twentieth-century examples in museum collections had steel hardware, while earlier specimens employed iron bands.

Construction

The artifact is very similar to many tools in public and private collections in North America, Europe and Britain. However common the materials and general structural appearance compared with other tools of this type, there are facets of construction that lend a unique character to each artifact. The length of the slots in the head (described previously) are peculiar to each tool. The number of holes drilled to enlarge the slots also varies. Apparently, the slots and holes were made by the tool's user or were at least modifications to suit his individual tastes or requirements.

Tools of this type, despite the fact that their slots differ, appear to have changed very little over the last several hundred years. Since the tool being examined is of similar construction when compared with other examples and exhibits similar wear marks, it is very likely an authentic artifact and not a reproduction.

Function

Although the size and weight of the specimens varied, all were constructed along similar lines and therefore must have been employed for a task that was essentially the same.

The existence of many other tools of this type seems to suggest that they were mass-produced for sale.

Provenance

After comparing the artifact with others, nothing more could be determined regarding the object's provenance.

Value

The number of these artifacts in widely scattered collections indicates that they were relatively common tools at one time.

Step 3: Supplementary Data

Note: Since the purpose of this exercise has been to show the type of information that may be acquired directly from artifacts (using a systematic analysis procedure) without the aid of documentary sources, only selected pieces of supplementary evidence are included in the third step. To gain as much knowledge as possible about the artifact under examination, a wide variety of supplementary data sources may be consulted. These include the use of both primary and secondary sources, oral history and the

assistance of specialists from various fields.

Material

According to Niels Jannasch of the Maritime Museum of the Atlantic in Halifax, those caulking mallets having heads composed of live oak were fabricated in the United States, whereas the head made of lignum vitae would likely have been manufactured in Britain. In a hardness test, it was determined that the head of this tool is of live oak, which helps locate its origin to a degree, but the determination of a more precise location is difficult.

Function

This mallet and others like it were used to caulk the seams of ships and boats of wood-plank construction to make them watertight. Caulking irons were struck by the mallet to force oakum into the seams. Obviously, the artifact performed a very necessary function, then, in both new construction and in ship repair. A caulker was considered to be a skilled worker and inefficent or careless use of this tool and caulking material could result in sprung seams and consequent damage to the hull. It is, perhaps, a tribute to their status that a caulker was more highly paid than an unskilled labourer and by 1864 a Caulker's Association of the City and Company of Saint John was organized.

In *Tools of the Maritime Trade*, Horsely claims the slot was the cause of a musical note created with each impact on the iron and that the pitch of the note could be varied by the size, number and location of the drilled holes. It was said that a good foreman could determine which caulker in his crew was applying his trade without having to actually witness his endeavours. The slots and holes also reduced the noise level of hardwood striking iron, and were necessary to prevent hearing loss. Fred G. Heans, the mallet's present owner, testified that the slot provides resonance and reduces the rebound effect and vibration in the handle. This may be speculation on his part as it was difficult to test this theory to our satisfaction. It is apparent at least that the slots and holes did serve a practical function.

Provenance

Information acquired from the mallet's present owner, Fred G. Heans:

This caulking mallet is known to have been used by William Heans (1831-1912) personally in the construction of the yacht *Canada*, built in 1898, and in ship repair and construction prior to this date. The *Canada* was constructed in the Hilyard boat yard (Saint John, New Brunswick) in a specially constructed shed at the foot of Main Street, on the edge of the Joseph A. Likely Co. millpond. The son of William Heans, Fred S. Heans (1868-1943) was also an experienced caulker and used this mallet in repairs to the *Canada* and in the construction of other yachts. In later years before the sale of the *Canada* in 1967, Fred G. Heans and his son Howard employed this particular mallet in preparing the yacht for the annual spring launchings from the yard of the Royal Kennebecasis Yacht Club of Saint John.

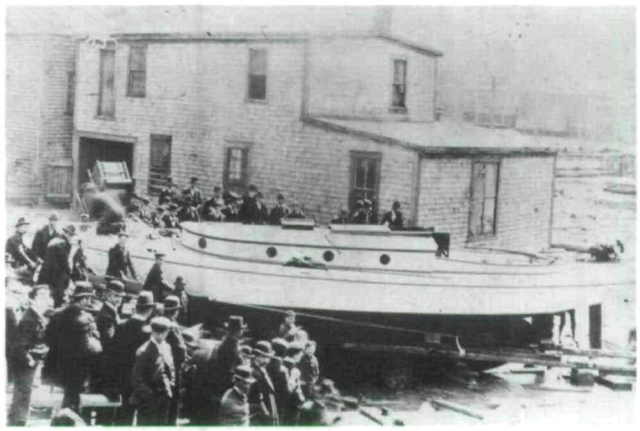

Fig. 2. The *Canada* being launched from the Hilyard boat yard, Saint John, New Brunswick, in 1898. Designed by Robert MacIntyre of Boston. Overall length: 42 feet; beam: 11 feet; registered net tons: 8.45; sail area: 1753 square feet. (Courtesy: New Brunswick Museum; from the collection of Col. G.G.K. Holder.)

Value

When new, the mallet would have been a relatively inexpensive piece of hardware, available locally in Saint John through a ship's chandler. However, mallets of this type are relatively rare today and therefore its value has increased. Today, the Heans family, although not willing to put a dollar value on this family treasure, would not be easily enticed to part with it. The tool is in fairly good condition, as a worn mallet would have a much shorter head, perhaps to the width of the iron rings on each end of the striking portions. Since the caulking iron must be struck with the wood portion of the head, not the metal ring, the relatively unworn condition of the head renders it still quite capable of employment in the purpose for which it was designed, adding to its value.

Step 4: Conclusions

Note: Only the major conclusions have been summarized. Most of the data gathered during the first three steps does not require further explanation.

After examining all observable, comparative and supplementary data, the following facts become clear. The caulking mallet was probably purchased by William Heans (1831-1912) directly from a ship's chandler in Saint John, New Brunswick, and according to family tradition, it was used to caulk the seams of numerous vessels prior to the construction of the yacht *Canada* in 1898. This particular caulking mallet is an example of a mass-produced tool of the nineteenth century, and the wood (live oak) used to construct the tool's head seems to indicate that it was manufactured in the United States and shipped to Saint John for sale.

Fig. 3. Group photograph of caulkers in the Hilyard boat yard on 28 November 1920. These men were working on the five-masted Greek schooner *Calmerios* when the photo was taken. (Courtesy: New Brunswick Museum; from the collection of Fred Heans.)

When used by Fred G. Heans in later years, the mallet was employed exclusively to repair the seams of the yacht, *Canada*. Earlier in its history it saw more heavy-duty use in caulking the seams of larger vessels in a section of the Hilyard yard rented by William and later Fred S. Heans. Since most modern pleasure craft are constructed of materials other than wood, it is not apt to function in the future as it was originally intended. However, the continued use of caulking mallets of this design over several centuries indicates that the tool was well suited for its intended function.

There are signs of misuse as indicated by the flattening of one of the wide metal rings. In normal use these rings were driven to the centre of the head as the wood wore down to prevent metal from striking metal. It may be that Howard, the son of Fred G. Heans, has put the mallet to uses other than for which it was intended and in doing so damaged the ring.

The original purpose of the mallet, however, is clear. It represents an integral part of the shipbuilding process in Saint John and other marine locations when wood was the primary material of construction. As witness to the transition years in ship construction, this caulking mallet is evocative of a period of maritime history very recent, yet remote.

NOTES

1. The class consisted of Darrel Butler, Elizabeth Earl, Robert Elliot, Gregg Finley, Kim Godwin, Gary Hughes, Milford Lewis and Gerald Thomas.
2. For more information on the Diploma Programme in Material History see *Material History Bulletin* 19, (Spring 1984): 57.
3. E. McClung Fleming, "Artifact Study: A Proposed Model," *Winterthur Portfolio* 9 (1973): 153-173. Jules Prown, "Mind in Matter: An Introduction to Material Culture Theory and Method," *Winterthur Portfolio* 17.1 (1982): 1-19.
4. Prown, "Mind in Matter," p. 2-3.
5. Prown, "Mind in Matter," p. 7.
6. Prown, "Mind in Matter," p. 14.
7. Robert S. Elliot, "A Case Study in New Brunswick Material History: Testing a Method for Artifact Analysis," Term Paper, History 6700, 1984, pp. 17, 32.

Proxemic Patterns: Eighteenth-Century Lunenburg-German Domestic Furnishings and Interiors*

A house reflects one way of organizing space to achieve an acceptable social and cultural fit in essentially two ways – (1) in its relationship to the larger architectural landscape of community, town, or city, and more specifically to the farmstead or homestead, and (2) the way it assists the inhabitants of a house in the routines of daily life within the confines of the domestic interior.[1] "Vernacular architecture, which by definition is built according to ethnic and regional traditions, is the product of a particular group's need for efficiently usable space."[2] Vernacular houses change slowly, following perceived shifts in community and domestic living habits. "Consequently, when architectural alterations do occur they usually first appear on the exterior and are cosmetic."[3] However, changes in floor plans, spatial alterations and other interior renovations affecting personal interactions and the placement and arrangement of household furnishings occur more slowly. The domestic setting with its interrelationships between objects, people and space is called proxemics and these relationships remain one of the most conservative elements of any household and community. Changes within these proxemic patterns reflect transformations within the family and by extension the society itself.

The term "Lunenburg German" is used throughout this paper to refer specifically to that group of "foreign Protestants" from Germany and Switzerland who established the town of Lunenburg, Nova Scotia, in 1753, and who created one of the most recognizable subcultures and material folk traditions in the Maritimes. The word often connotes a particular body of utensils, furniture and accessories, which implies a regional definition for objects decorated with particular motifs and designs. Although these designs may appear elsewhere in Nova Scotia, the use of certain benchmark motifs such as the flower-in-pot, the heart, the diamond and compass star, and the star do suggest direct and in-direct Germanic influences, which

* This article was presented on March 10, 1985, at the Atlantic Canada Eighteenth Century Society meetings held at Dalhousie University in Halifax, Nova Scotia. The topic was suggested by the chapter on "Proxemic Patterns" in Scott Swank, *Arts of the Pennsylvania Germans* (see note 1) and by my thesis research on the domestic arts and architecture of the Lunenburg-Germans of Nova Scotia. I have followed the format of Swank's presentation including paraphrasing and quoting certain paragraphs where there are strong similarities between the Lunenburg and Pennsylvania-German inventories and proxemic patterns.