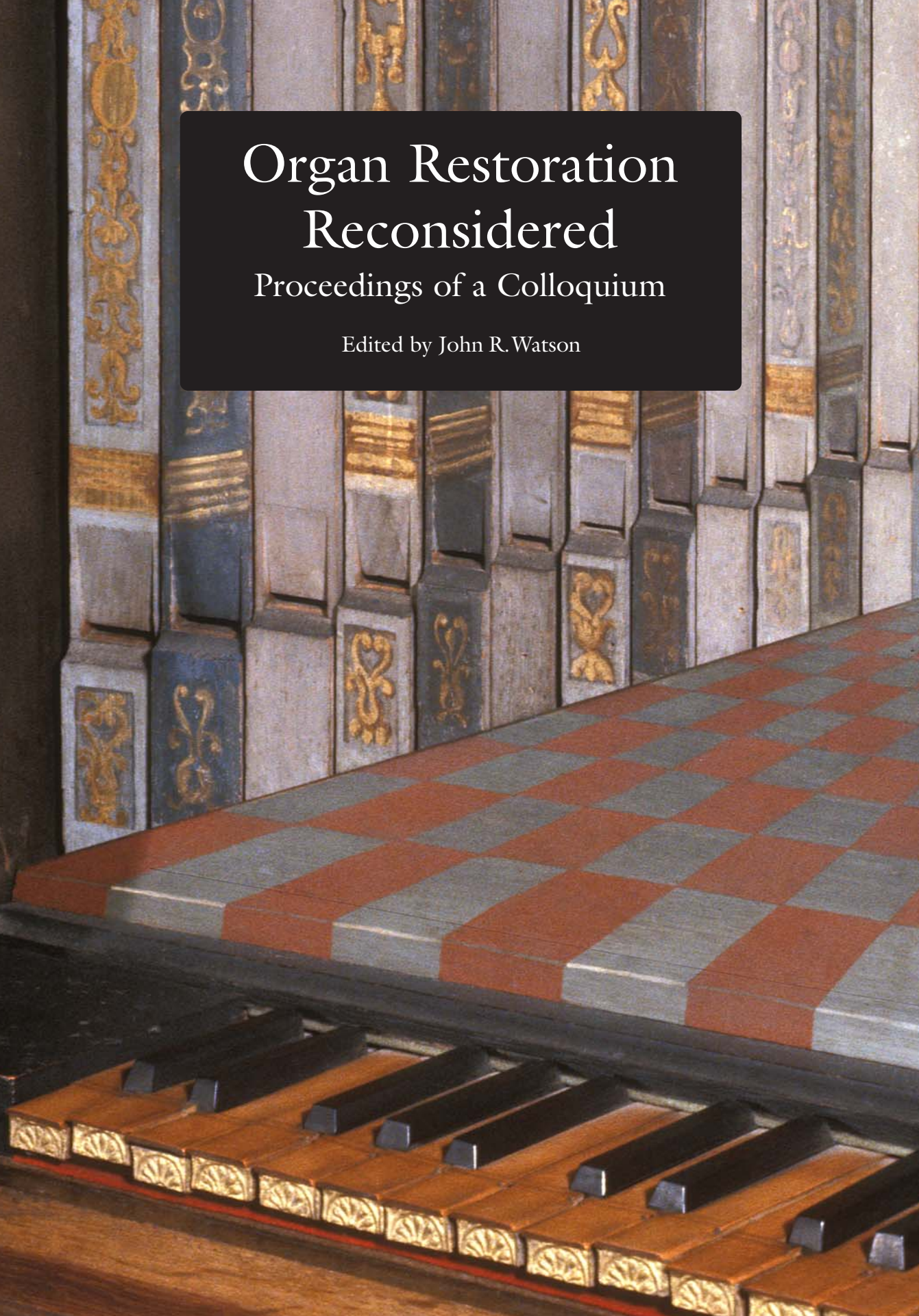

Organ Restoration Reconsidered

Proceedings of a Colloquium

Edited by John R. Watson

Detroit Monographs in Musicology/Studies in Music, No. 44

Editor
Susan Parisi
University of Illinois

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The Historic St. Luke's Organ after conservation of the doors
Photograph by Robert Hart

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Preface

The chapters in this volume evolved from papers presented at the colloquium, "Historic Organs Reconsidered: Restoration and Conservation for a New Century," hosted by Historic St. Luke's Church in Smithfield, Virginia, in 1999. I and the authors wish to thank the members of the 1999 Historic St. Luke's Church organ committee, Richard Austin (curator), Jock Darling, Fran Olsen, George Wright (chair), and Rev. Merrill Orne Young, and the trustees of Historic St. Luke's Church, for making this undertaking possible, as well as to thank The Colonial Williamsburg Foundation for the Foundation's cosponsorship and financial support of both the colloquium and these published proceedings. For giving me time and guidance on this project I also extend my heartfelt thanks to my colleagues at Colonial Williamsburg Foundation, especially to Ronald Hurst, Gary Burger, Richard McCluney, and Joseph Rountree. Finally, it was a great pleasure to work with series editor Susan Parisi, publications director Elaine Gorzelski, and typographer Colleen McRorie, all of Harmonie Park Press.

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John R. Watson

Williamsburg
October 2004

Introduction

Few artifacts in our material heritage are required to work in their old age as are some historic musical instruments. And of musical instruments, pipe organs are among the most often held to a regular and busy schedule of use. The paradox of preserving the physical/historical testimony (stopping change) while also restoring (changing) the instrument was thrown into dramatic relief with the recent reappearance of an organ offering so much we want to observe and hear both historically and musically. It is against the backdrop of that organ that this book considers the counterpoint between the separate themes of restoration and preservation.

Depending on who you ask, it was either divine providence, or an accident of fate that landed an exceptionally rare, 1630 English chamber organ at a church-museum in the small southern town of Smithfield, Virginia. The artifact came to Historic St. Luke's Church (HSL) in 1957 from the English Tudor manor house for which it was apparently built, after passing briefly through the hands of a collector. In Virginia, the organ quickly succumbed to dry winter heat, remaining silent and little noticed.

Little noticed, that is, until recently. During the 1990s, organ history scholars rediscovered the then-369 year-old organ and its most auspicious past. Barbara Owen's article in this volume and another in the *Tracker* tell more about the process of discovery in which she was a key player. The stage was set for some kind of change in the long life of the old organ. Yet it is precisely because so little "change" had occurred to the organ through its history that we were so moved by its unlikely survival. The United States is home to several of the world's premier organ builders and historians, as well as several of the world's premier museums and conservation graduate schools, yet there had never been an organized meeting of these allied professionals on American soil. So rare and important was the St. Luke's organ, so insistent were the voices calling for its restoration, and so controversial has restoration become, that the catalyst was in place for something dramatic to happen.

In January 1999, Historic St. Luke's Church hosted an international colloquium entitled "Historic Organs Reconsidered: Restoration and Conservation for a New Century." Thirty-four invited specialists from England, Canada, the Netherlands, Sweden, Scotland, Australia, and the United States descended on Smithfield—a spectacle not soon to be

forgotten by the local residents. Neither will the guests soon forget the spectacular hospitality they received in return.

The present volume constitutes proceedings of that colloquium. The organ at Historic St. Luke's Church is the compelling focus for some of the chapters. Others use the organ as a backdrop for a discussion about other organ restoration projects, or the implications of historical research for restoration ethics, or the problems of restoration in general. The chapters represent many of the diverse views driving organ restoration at the turn of the twenty-first century. The editor has unified some language conventions, but there is no editorial unification of opinion. The book is divided into four sections.

PART 1:
Conservation and Restoration in Context

Part 1 places the often-vexing issues of organ restoration in a broad context of musical instrument restoration and historic preservation in general. It is the nature of paradox that viewpoints can be at the same time both rational and conflicting. The first five chapters put the paradox under a magnifying glass, dissecting it and illuminating its confusing elements. Each of the authors urges a bipartisan consideration of seemingly conflicting issues: we must not choose a side and fight, but intelligently consider the whole diversity of views to make the most broadly informed decisions about organ restoration.

Laurence Libin leads off with his provocative article "Considerations for the Future of Historic Organs." An organ is more than a musical instrument; each of its functions in society affects the plan for its care. We often fool ourselves about the historical purity of surviving organs and the impact of our own interventions. Restorers, conservators, and even museums have a mixed history of successes and failures in the preservation of historic objects, and perspectives continue to change; a background against which we must make value judgments.

My article, "Beyond Sound: Preserving the Other Voice of Historic Organs," picks up on the broader meaning of organs to musical culture. The article states the case for preserving the "historical voice" in old instruments that is vulnerable to loss in traditional restoration. The historical voice tells in surprising detail the methods by which the instruments were constructed. As we learn to recognize and read that evidence, we are compelled to preserve it because it continually informs our building of new instruments.

In "The Restorer and the Conservator: Deconstructing Stereotypes," Robert Barclay describes three "regimens of function," each dictating distinct values and actions toward musical instruments. Abandoning old language with its unwanted connotations, he describes quite different approaches to instrument care according to their classification in three regimens he calls "Currency, Restitution, and Preservation." By clarifying issues of rationale, motive, and context, he envisions a "new contextualism" to replace the old dialectic between "play versus conserve."

Darryl Martin looks at the importance of nonplaying instruments to an organologist and the intertwining of organs with related instruments in his "Parallel to the Organ: The English Virginal in Stewart England." The ability of instruments to provide details about their manufacture is inversely related to the extent of their restoration. We have been too optimistic about the usefulness of hearing aged instruments and not confident enough about the usefulness of hearing accurate copies.

Part 2:
Conservation and Organs

Conservation, as we now know it, is a relatively new and (like organ restoration itself) very specialized discipline. What are the values, methods, and activities of specialist conservators? What relevance does knowledge of chemistry and materials science have for organ restoration? How can treatment approaches used on nonmusical artifacts inform organ restoration? The two chapters in this section are like visits to two conservation laboratories; an inside glimpse of the world of the conservator.

In "A Conservator's Contribution to the Restoration Team," David Blanchfield demonstrates through routine treatments the conservator's values, resources, and methods. He shows how conservators minimize the erosion of physical evidence during restoration. While organ restoration is generally carried out in the specially equipped workshops of organ restorers, he proposes that a trained conservator can be a useful consultant or participant on the organ restoration team.

Paintings conservator David Goist demonstrates principles of conservation in an article documenting his recent treatment of the doors of the Historic St. Luke's organ. He relies on technical analysis of materials and undertakes restorative and stabilization treatments designed to recover aesthetic qualities. The work exhibits the conservator's commitment to objectives of accessibility, durability, "reversibility," and historical integrity.

Part 3:
The Historic St. Luke's Organ: A Case Study

The first part of the book has already shown how the early seventeenth-century chamber organ now at Historic St. Luke's Restoration powerfully tests our understanding of the paradox of restoration. It provides a dramatic case for discussing alternative philosophies of restoration. Part 2 focuses more intensely on the HSL organ and its place in musical history. The organ is a worthy example for demonstrating the diverse academic disciplines needed to illuminate its history and cultural meaning, now obscured by the passage of nearly four centuries.

Barbara Owen's contribution, "Reflections on a Chamber Organ," reconstructs the instrument's history through time as a means to inform restoration. She pieces together the lively "biography" of the HSL organ, drawing from written documents as well as physical evidence uncovered during the examination that followed the colloquium. She closes with a plea to let musical instruments fulfill their musical destiny through restoration.

If restoration is to return an instrument to a past state, we must thoroughly research the past state. Christopher Kent gives compelling evidence from the seemingly tangential source of period musical scores for reconstructing such important details as an organ's pitch and temperament. Again the HSL organ, with its probable connection to the celebrated Tudor composer John Jenkins, serves as an ideal application of the method. Such information informs not only restoration, but also our insight and method for examining the instrument.

Objects of cultural history never existed in a vacuum, nor can we understand them apart from their milieu. Dominic Gwynn's grasp of the musical and organ culture of sixteenth-century England shows the importance of context in understanding the HSL organ. He considers context in its many dimensions, including musical, stylistic, morphological, decorative, technological, and sonorous. Gwynn is uniquely qualified to place the organ among the other surviving instruments of the period.

PART 4:
European and American Case Studies

In the final section of the book, three organ builders and two museum curators describe their perspectives on organ restoration, both in general terms and through several important case studies. Here we see most of the diverse themes already articulated along with some new insights applied to important American and European organs.

George Taylor and Bruce Shull give a timely report on the early stages of their restoration of an 1800 organ by David Tannenberg. They summarize an extensive research effort in which early photographs played an especially useful role. Understanding Tannenberg's organ building tradition required a study of precedents in Saxony. Some surprises affected the restorers' interpretations. The article ends with an endorsement of restoration experience for organ builders who interpret organ history through the building of new, historically informed instruments.

Raymond J. Brunner gives his view of restoration in "Organ Restoration: Problems and Solutions." He begins with a useful description of the modern evolution of organ preservation in the United States, prompted as it was by the wanton replacement of pipe organs with electronic substitutes. After describing restorations of two Tannenberg organs and another by Samuel Green, he closes with some recommendations.

Two organs in the default preservation of disuse in former communist-occupied Eastern Europe are the case studies in Göran Grahn's article, "The Only One in the World:

Two Case Studies from the Baltic States." With the end of state suppression of religious activities, the organs are entering the glare of attention and certain restoration. Grahn describes two survivors: singular examples by Christoph Wilhelm Braveleit and Johann Andreas Stein. Untouched by invasive modern restorations, the organs await sensitive treatment based on Grahn's recommendations.

Is it ever preferable to preserve an intact historic organ in a nonplaying state? Darcy Kuronen explores the question with his chapter, "An Organized Piano by Alpheus Babcock." Neither the organ component, probably made by William Goodrich of Boston, nor Babcock's piano, one of three with his seminal one-piece metal frame design, have been restored in modern times. With so much historical material surviving in an instrument of singular significance, the curator concludes that history is best served by preserving it in nonplaying condition.

* * * *

Following the presentation of scholarly papers, and in the spirit of the historic church, the colloquium ended with a Service of Morning Prayer. Rev. Merrill Orne Young, one of the members of the HSL organ committee, provided the homily. In it he said, "so secular history is not wholly alien from sacred history, and we who devote ourselves to studies of the past may also find in our work hints of a promise that something better than the present lies at the end of the journey." The colloquium clearly challenged us all that our stewardship of historic organs, and our ability to learn from them and preserve them, will be continuously "something better" and that the future for us, the instruments in our care, and our descendants will be one of promise.

John R. Watson

Part 1

Conservation and Restoration in Context

1

Considerations for the Future of Historic Organs

Laurence Libin

Musical instruments serve many functions in addition to their use in performance. Even when silent, instruments can function as status symbols and visible indicators of taste; as objects of art and of devotion; as repositories of legend and folklore; as vehicles for investment and income generation; as primary evidence about obscure craft techniques and changing musical fashions; as showcases for experiment with new materials, technologies, designs, and modes of expression; and as embodiments of personal creativity reflecting the spirit of their times. These functions and more must be taken into account in defining an instrument's significance, which may reside more in its provenance, rarity, or symbolism than in its sound. For example, despite the crack that renders it voiceless, Americans esteem the Liberty Bell as a national emblem resonant with historical meaning.

Organs by their very nature project exceptional qualities of monumentality, complexity, and emotional impact. Therefore, more often than is the case with relatively inconspicuous instruments, decisions regarding the fate of historic organs often involve difficult compromises. Striking an acceptable three-way balance among the desire (some would say, the overriding imperative) to preserve original elements and characteristics intact, practical performance needs requiring the renewal of outmoded, worn, or lost material, and affordability depends on thoroughly airing and understanding these issues. Such understanding, though, may prove elusive because professional conservators, organ restorers and players, historians, and funding committees commonly have vastly differing expectations, philosophies, even vocabularies.

Complicating this already tangled situation is the realization that, like the repeatedly recast Liberty Bell, most old organs have been structurally, mechanically, visually, or tonally altered. Many have also been divorced from their original homes and purposes; and since organs are often designed for specific surroundings and particular uses, they are not always easily transferable to others without some loss of aesthetic or functional integrity. (Like a consort of recorders, a portable chamber organ like Smithfield's can sound puny and ineffective in an unsuitably large space.) Thus, in the course of time an instrument's initial state can become impossible to determine and its builder's unified concept can be distorted. On the other hand, alterations can sometimes improve an old instrument's musical effectiveness;

might not further changes likewise enhance its value? This depends on the perspective from which the organ is valued; at first its musicality and appearance may be paramount, but after centuries, like the Liberty Bell it may appear more valuable for other reasons.

In addition to loss of original characteristics, wide differences of taste and outlook might seem like insurmountable challenges to treating a historic organ with appropriate regard for all its functions. Still, persons with varying view-points should be able to agree upon basic principles to guide joint decisions about conservation or restoration. Such principles can be hard to formulate but might take account of ideas such as these:

- Improved understanding and appreciation of our cultural heritage ultimately depends upon preservation of primary source material.
- Not everything old is necessarily worth preserving, but "worth" sometimes becomes apparent only after something has been lost.
- In any course of action or inaction, risk and cost can outweigh benefit (to whom? who decides?).
- As in medicine, diagnosis and treatment of an organ's condition involve subjective interpretation best left to experts.
- Even experts cannot anticipate the thrust of future inquiries, but we may assume that future diagnostic and treatment abilities will surpass ours.
- Even the best achievable documentation cannot replace its tangible subject, but it is indispensable.

With such thoughts in mind, proposals to restore any historic organ to satisfactory playing condition, and to keeping it that way, require critical scrutiny from every angle.

Unfortunately, outside carefully managed museums and historic sites—and even within them—deciding between conservation versus restoration often falls not to competent experts but to inexperienced persons whose judgment might not be based on thorough technical and historical knowledge. Committees of amateurs and administrators can too often be swayed by appealing rhetoric, at worst leading them to replace potentially fine organs by inferior electronic substitutes. But with luck, their decisions can turn out to be wise, or at least to represent reasonable compromises between high ideals and functional and economic necessities. It does little good for historic preservationists to insist on unfeasible goals, especially if excessive zeal marks idealists as crackpots or snobs and damages their credibility.

Negotiation and compromise involve listening. If inexperienced bill-payers at least listen to informed specialists, enlightenment is possible. But if experts cannot agree among themselves and present, if not a united, persuasive position, at least a range of sensible options, hope for progress is vain. In the case of the Smithfield organ, unresolved disagreement could lead to forfeiting a once-in-a-lifetime opportunity for detailed collaborative

study and scientific analysis of a possibly unique artifact; inadvertently obscuring some of its vital information and characteristics; or irreversibly damaging this precious artifact whose custodians have, up to now, guarded it well according to their lights. That this historic organ survives at all is nothing short of amazing; few comparable ones exist. It would be a shame to bring its past and present owners' vigilance to naught through hasty decisions based not on objective, thorough assessment of risks and potential benefits, but on unrealistic expectations and misguided enthusiasm.

A sad instance of missed opportunity was the rebuilding not long ago of an anonymous, supposedly English baroque chamber organ formerly in the possession of William Randolph Hearst, now in a parochial school chapel in Manhattan. Leaving aside questions of its age and authenticity, this organ was obviously gutted and reconstructed without regard for preservation of old parts and documentation of its former state. We may never know what was lost because the organ today tells so little about its past. Worst of all, because the new work was not durable the organ already needs another costly overhaul. So neither historic preservation nor long-term serviceability was achieved.

Reconciling these goals—preserving versus using—is hard, to say the least, and it must be reemphasized that there are few easy answers to this dilemma. The Organ Historical Society's restoration guidelines[1] offer a useful starting point for discussion, but the Smithfield instrument demands a more sophisticated and comprehensive approach, taking into account its significance not only for performers, listeners, and musicologists, but as a rare work of engineering that may preserve a wealth of information about English baroque organ design and technology, style and symbolism, and so forth.

At Historic St. Luke's, respect for artifacts that embody cherished traditions is an ideal as thoughtfully upheld by its custodians as by many respectable museums, so perhaps a museum curator's overview may be relevant to this discussion. In museums as late as the 1960s and 1970s, decrepit old instruments were routinely fixed so they could once again be played and heard. The main reasons for this were to enable musicians to entertain museum visitors with unfamiliar, intriguing sounds from the past, and to satisfy legitimate curiosity about the instruments' qualities and playing techniques.

However praiseworthy these aims might be, much of the so-called restoration was speculative and destructive, as indeed was much parallel work done outside museums. Many valuable antique instruments were renovated repeatedly according to changing ideas of authenticity, with original parts replaced or irreversibly altered and no adequate record kept of the process. This is not to say that the perpetrators were stupid or unethical; probably it never dawned on them that their well-intentioned labor might inadvertently destroy something of future value.

When the modern "early music" movement began to take hold commercially in the mid-twentieth century, a reaction set in as historically minded instrument makers looking for fine antiques to copy realized that many museum pieces had been so altered that their

[1] These guidelines appear in *The Tracker* 30, no. 2 (1986): 18.

original states could no longer be determined; thus, they had become practically useless as models. About the same time, craftsmen working as restorers in museums began to be replaced by scientifically trained conservators, many of whom saw their job as mainly investigative rather than restorative. These younger conservators, along with many other critics, felt, rightly, that much unique material and information had been irretrievably lost through ill-considered, inadequately documented restoration of all kinds of artifacts, not just musical instruments. To take an egregious case, in 1939 the Elgin marbles in the British Museum were scraped and sanded to make them look appealing to modern eyes, and consequently these famous Greek sculptures lost what had remained of their antique surfaces.

No less unfortunate for music history was the drastic overhaul at the Metropolitan Museum of Art in 1938 and 1939 of the world's oldest extant piano, built in 1720 by the instrument's inventor, Bartolomeo Cristofori. In order to return the Cristofori piano to acceptable playing condition, the museum's restorers installed a new bottom, new wrest plank, and new sound board, and various other changes were made of which no detailed record was kept. Not only that: the old pieces that had to be removed were mostly lost. How we wish, now, that this seminal piano had been left alone so that it could have been closely studied and faithfully replicated! But the Cristofori piano had already been extensively altered before it entered the museum's collection in 1896, so its evidentiary value was already compromised.

To a greater or lesser degree, compromised integrity characterizes many old instruments preserved in museums, as well as most that remain in regular use elsewhere. For example, of the 600 or so extant Stradivari violins, not one remains in its original condition, so we really have only an approximate idea of how Stradivari meant his violins to sound. In fact, it seems that many baroque violins began to be changed almost as soon as they left the workshop, as players customized them for individual needs. Similarly with baroque organs: as mentioned above, most have been modified to some extent, often unsympathetically; apart from revised stop lists, few preserve original tunings or blowing systems, so crucial to their musical effect. That very few antique instruments of any kind survive intact is also due to the inevitable wear-and-tear of ordinary use and routine maintenance, to say nothing of deterioration through natural aging and environmental causes.

Looking back at the wreckage, the new breed of conservators reacted with understandable dismay; some extremists among them have even insisted that no further restoration or performance on old instruments should be allowed, only stabilization and scientific examination. Such a policy could indeed retard deterioration, at the cost of tightly restricting musicians' access to the objects. Recently, one dogmatic conservator has gone so far as to proclaim that "Playing original early instruments for historic and aesthetic reasons is philosophically unsound."[2] The writer's point is that because musical instruments unavoidably

[2] Robert L. Barclay, ed., *The Care of Historic Musical Instruments* (Edinburgh: Canadian Conservation Institute and Museums & Galleries Commission in cooperation with the International Committee of Musical Instrument Museums and Collections of the International Council of Museums with financial assistance from the John

change over time, old ones cannot sound or work exactly as they did when new, therefore in their present condition they misrepresent what their builders intended.

However, to paraphrase *Hamlet*, there's more to history and aesthetics than is dreamt of in this arid philosophy. Are we to understand that the Elgin marbles should not be shown today because their current state misrepresents what the sculptor Phidias intended in 430 B.C.? This is absurd; viewers appreciate the sculpture for what it is now, regardless of its former true colors. The same holds true for innumerable other damaged, distorted works of art that are nevertheless revered as masterpieces. Should music-lovers stop listening to Wanda Landowska's recordings of Bach because they may not be faithful to the composer's intent, assuming this could be known? Nonsense. The fundamental issue is not so much what is fair to the work of art or its creator, but what is best for people today and in the future. If not for the sake of society, why should museums, churches, and other custodians preserve things at all?

It is very good, indeed necessary to speak up for the welfare and integrity of musical instruments that cannot defend themselves, particularly because we cannot anticipate what succeeding generations will want to learn from them. But all the extrinsic values assigned to things—historical, aesthetic, monetary, whatever—are defined by people and are therefore subjective and debatable. Arguments for hands-off preservation can be strong but are not invariably more convincing than proposals for sensitive restoration that could allow an old, nonworking instrument once again to be heard. Intermediate options, such as idealized replication, also deserve full consideration before a decision on treatment is rendered.

No less questionable is the same conservator's assertion that "Museums exist primarily to preserve the information inherent in objects."[3] This notion would have astounded the founders of our great public institutions, not to mention today's visitors. The Metropolitan Museum of Art, for one, was chartered in 1870 explicitly for the purpose "of encouraging and developing the study of the fine arts, and the application of arts to manufacture and practical life, of advancing the general knowledge of kindred subjects, and, to that end, of furnishing popular instruction and recreation."[4] Not a word appears in the museum's charter about preserving information or even preserving objects; and let it not be said that such preservation was taken for granted.

The idea that works of art must be preserved intact for their own sake, let alone as repositories of information, is after all rather novel. Consider the opinion voiced in 1857 by the British High Court Justice John Taylor Coleridge in discussing whether the London National Gallery's paintings should be removed to a less polluted but less accessible location:

S. Cohen Foundation, 1997), 107. Although occasionally polemical, this handbook contains much information relevant to organ restoration; a review by the present author is in *Journal of the American Musical Instrument Society* 25 (1999): 157-60.

[3] Ibid., 111.

[4] Quoted in Winifred E. Howe, *A History of The Metropolitan Museum of Art* (New York: for The Metropolitan Museum of Art by Columbia University Press, 1946), 2:xi.

> . . . if it were demonstrable that the pictures in their present position must absolutely perish . . . this would conclude nothing. The existence of the pictures is not the end of the collection, but a means only to give the people an ennobling enjoyment. . . . If, while so employed, a great picture 'perished in the using' . . . it could not be said that the picture had not fulfilled the best purpose of its purchase, or that it had been lost in its results to the nation.[5]

More succinctly, in the same report of the National Gallery Site Commission the distinguished architect and critic Digby Wyatt asserted, ". . . that wilfully to destroy a picture would be a sin; but to neglect making use of it altogether, because the making use of it would endanger its existence, or hasten the period of its destruction, would be a folly."[6]

I cite these opinions not because I wholeheartedly agree with them—I do not—but only to show that attitudes toward conservation can change radically; our generation does not speak the definitive last word on this matter. Today, preservation is an urgent priority in many fields, from urban architecture to nature conservancy; some zoos and botanical gardens, for example, now focus on maintaining the genetic stock of endangered species, a purpose unheard-of not long ago. These important efforts reflect today's perceptions; tomorrow's may be different.

Regardless of the laudable wish to safeguard wonderful things, we simply cannot keep everything intact; entropy guarantees ultimate degradation. What to do in the meantime but make the best use of limited resources? In a democracy this often involves compromise; we must sometimes adapt historic organs and other structures to modern uses and accept the risk if we are to hold onto them at all. Furthermore, American museums commonly dispose of unwanted holdings without a thought for their remaining in the public domain; so much for preserving information. Every exhibition, every loan, every exposure carries a potential for damage or loss; if preservation were in fact the primary aim of today's museums, many works of art would be much less visible and many artists' wishes would truly be subverted.

In considering the restoration and thus the alteration of any historic property, risk is a constant factor that has to be weighed against benefit on a case-by-case basis, by informed but not omniscient custodians. Cautious conservators typically stress the risk side of the equation, but that is only half the issue; social benefits, being mostly intangible, are harder to measure but are nonetheless crucial to the survival of public museums and historic sites.

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[5] 1857 Report of the National Gallery Site Commission, quoted by Neil MacGregor, *To the Happier Carpenter': Rembrandt's War-Heroine Margaretha de Geer, the London Public and the Right to Pictures* (Groningen: The Gerson Lectures Foundation, 1995), 29-30.

[6] Ibid., 29.

Of course no one doubts the necessity of scientific examination and conservation; stabilization and in-depth study of objects are essential steps toward understanding and appreciating works of art and their creators. But just as chromatographic analysis of an old wine is not the same as tasting it, so studying and describing an old organ is not the same as hearing one, whatever condition it happens to be in. Performance on antique instruments creates a special aura—perhaps receptivity is a better word—that eludes scientific definition but is real and vivid to persons who claim to experience it. By all means, play replicas too—but there is no guarantee that even the most accurate copy will sound and respond just as the original once did. Even if it did, and we could somehow know this with certainty, playing and hearing a real antique instrument can still arouse emotional responses that no replica can evoke—whether awe, dismay, or what you will; this is the difference between confronting the "real thing" rather than the most faithful reconstruction. It is not the job of museums to tell people how they should respond, but simply to present the real, original work in the most honest way possible—often, regrettably, in a silent state but sometimes, under appropriate circumstances, in performance.

Unfortunately, without some degree of restoration, most old instruments cannot be returned to any sort of satisfactory playing condition and so must remain unheard and therefore unknown in the fullest sense. (Merely determining an instrument's pitch and tuning through indirect procedures is of limited aesthetic interest.) Yet, no one seriously advocates trying to restore the Elgin marbles to their original finish, so why should antique instruments be treated differently, with less reverence? Clearly, they would not be if they were valued as highly as those sculptures. Even so, restoration that threatens what remains of the integrity, the authenticity, the aesthetic quality and evidentiary value of an important old instrument should not be casually attempted. But are all old instruments equally important and worth preserving untouched, only for specialists to study?

Here we confront an issue that often divides conservators and curators. Professionally trained conservators, like medical doctors, are taught to accord appropriate treatment to all that comes under their care, without regard to presumed value. An ethical conservator ideally approaches every artifact with the same respectful attitude; it is not the conservator's business, any more than it is a surgeon's, to evaluate the worth of the patient. It is, however, a curator's responsibility to make qualitative judgments, to distinguish greatness from mediocrity, knowing full well that such judgments may be challenged and perhaps refuted. So be it. Failure to discriminate implies that all things are created equal, and this is simply not so. In most museums, curators are the specialists charged with deciding what is most worth preserving and how it should best be interpreted, also what is expendable and how it might be expended beneficially rather than wasted.

It is important to keep in mind, parenthetically, that age alone is no proof of quality; just because something is old does not mean it is especially valuable. Rarity is a different matter. The point here is that making value judgments is a perilous but necessary curatorial responsibility, but criteria for evaluation are not always simple or self-evident even to curators.

Certainly, any decision about restoring and using an old instrument should rest on the fullest available knowledge of its history and significance, its materials and their properties, its design, construction and condition, and the many factors tending toward deterioration—factors that include biological attack, air pollution, the effects of different treatments, as well as absence of treatment, and other avoidable hazards, including the danger of excessive or unsupervised use if it should be restored. Usually it is better to do nothing than to risk a serious, irreversible mistake with a rare, exemplary object. In short, responsible decision-making requires informed consideration of the full range of possibilities, risks, benefits, and interests.

That having been said, the case for restoration to playing condition can be compelling, especially when maintaining the status quo invites total loss. Two restorations of historic organs owned by the Metropolitan Museum of Art are exemplary. The first concerns the Museum's 1830 Thomas Appleton organ, which was purchased 1982 and subsequently restored by the Brooklyn firm of Mann & Trupiano. It is hard to imagine how such a gorgeous fifteen-rank instrument by a major American builder could drop out of sight, but it was found quite by chance, boarded over and forgotten in a fire-trap wooden church (fig. 1.1). Without relating the organ's history here, suffice it to say that it is generally considered the best-preserved example of Thomas Appleton's work, warranting citation by the Organ Historical Society for "exceptional historic merit." Happily, it survived with little alteration, notably the addition of an independent sixteen-foot pedal rank and a new pedalboard about 1883.

FIG. 1.1. *The Appleton organ as discovered in Plains, Pa., showing the ceiling which was lowered around the case, both obscuring and protecting the upper portion*

The Appleton's restoration involved mostly cleaning and releathering, replacing or fixing broken trackers, and adding an optional electric blower. Frankly I regret this work was not taken further; for example, the fragile old leather nuts were retained and these make regulation difficult. I doubt that anything can be learned from leaving the leather nuts in situ that could not be known equally well by removing and saving them;

their locations on the tracker wires certainly do not tell anything about Appleton's regulation habits since they have been screwed around so often, and in any case they themselves might be replacements. Of course I might be wrong about this and that is why the old nuts remain in place. However, failing to releather the wind system would have kept the organ mute, and I decided that its sound was more important than whatever information might have inhered in the cracked old bellows leather.

FIG. 1.2. *The Appleton organ as currently installed at the Metropolitan Museum of Art and restored for recital use*

Now that the Appleton is regularly heard in short recitals and has been professionally recorded several times, the decision to return it to playing condition (fig. 1.2) seems to have been justified by the public's response—and this public includes the many organists who have been inspired or at least instructed by playing it. No matter that it is a little small for the vast, resonant space it occupies, and that its mahogany case has faded somewhat; at least it can be seen in its entirety. The main thing is the organ's delightful musicality, which together with its impressive appearance has greatly enhanced visitors' appreciation for an American masterwork of a kind too seldom encountered. Obviously the original tuning and wind pressure cannot be known precisely, but there is no reason to think Lawrence

FIG. 1.3. *The Samuel Green organ during installation by R. J. Brunner and Co. at the Moravian College Department of Music*

Trupiano's result falls outside Appleton's parameters. We were lucky to find the organ and I hate to think of what would have been lost if it had been vandalized or burned in the unprotected church—incidentally, its third or fourth home. It seems to me that whatever information might perhaps have been sacrificed by restoration has been heavily outweighed by the definite and continuing gain to the public.

The second case is the restoration, completed in August 1998 by R. J. Brunner & Co. of Silver Spring, Pennsylvania, of the Metropolitan Museum's four-rank Samuel Green chamber organ, made in London about 1795 and probably shipped to New York early in the nineteenth century (fig. 1.3). Although more seriously altered than the Appleton, this organ is currently believed to be the best-preserved example of Green's work in North America. Fortunately, several closely comparable, well-documented Green organs survive in England; information derived from them guided the restoration. Aside from its sweet tone and responsive touch, this handsome little instrument is noteworthy for its horizontal bellows, said to be an innovation of Green's. This organ, cited in David Wickens's 1987 book on Samuel Green,[7] was known earlier to a few American organ historians but was otherwise generally ignored after an unsuccessful, undocumented repair attempt in the 1950s. The organ was unplayable but in basically good condition when I encountered it in 1992, crammed into a low-ceilinged room in a historic house in Plattsburgh, New York. It served no useful purpose there, being wholly out of context, and its owners were glad to gain the space and income from its sale.

The Green organ first came to the Metropolitan Museum for examination and some cosmetic repairs, and when restoration was determined to be feasible it was entrusted to the highly experienced Brunner firm. Their work was painstaking but not especially problematic save for the metal pipes which had been slightly cut down, resulting in anachronistic pitch and tuning. As an expedient the pipes were fitted with stainless steel sliders; eventually,

[7] David C. Wickens, *The Instruments of Samuel Green* (London: Macmillan, 1987), 161.

if funds allow, the pipes might be permanently lengthened and cone-tuned. Currently on long-term loan to the Moravian College music department in Bethlehem, Pennsylvania, the organ looks, feels, and sounds wonderful and has a prominent, acoustically favorable place in an educational institution with a 250-year history of fostering instrumental music. I cannot imagine a more auspicious location for it and feel confident that no crucial information was lost as a result of the Brunners' carefully documented work. In this case, to have been paralyzed by indecision and thereby risk the organ's further neglect would have been, in Digby Wyatt's words, a folly.

While these two cases seem straightforward, I would have had strong reservations about restoring either of these instruments if it had been the only extant work of its maker, as the Smithfield organ might be (although it and a similarly painted organ front panel owned by John Mander might come from the same milieu). Still, this need not be an all-or-nothing situation. Conservation and restoration do not have to be mutually exclusive if agreement can be reached on what must at all costs be left untouched; settling that issue should helpfully narrow the range of options.

I would like to conclude by posing three broad questions. First, whose ultimate purposes is the Smithfield organ intended to serve, for how long and in what manner? Second, what benefits or risks might attach to any proposed course of action, including maintaining the status quo (albeit with inadequate climate control)? Third, whose responsibility is it, finally, to answer the preceding two questions, and how will these persons be held accountable? Although the decision makers will no doubt be judged severely no matter what course is taken, I believe they would do best to err on the side of caution, putting off any further restoration treatment at least until the organ's significance is more fully revealed. This process will take months, not days, of close study both in Virginia and in England.

If I may offer a recommendation, it would be to start by making a set of full-scale technical drawings backed up by photographs, material analyses, and other physical data perhaps obtained with help from forensic scientists at the Institute for Advanced Technology in the Humanities at the University of Virginia. Use these together with reference to the original instrument to build an undecorated, idealized working copy of the Smithfield organ, which would serve as a guide and insurance policy for any further restoration of the original. In my experience, more is learned from copying an entire instrument than from fixing this or that part. Certainly the lessons learned from thorough documentation and replication, and the usefulness of the copy, would more than repay their cost. The information gained would constitute a permanent record of the organ that might outlive it and that in any event would allow others, too, to make accurate working replicas.[8] Far

[8] John Shortridge, of Albuquerque, New Mexico, is constructing an organ based on the Smithfield's pipe scales, but it will not replicate the original stop action and blowing mechanism; personal communication, 24 February 1999.

from diminishing the value of the original organ, useful copies would call attention to it and to the wisdom and generosity of its custodians.

During the phase of study and replication, solutions could be sought to problems of climate control and long-term security for the irreplaceable original organ. If it appears unfeasible for the church building to house it safely, the copy could be kept and freely used there and the antique (which after all has no historical connection to the church) could be moved to a better protected but more accessible location. This might be the best stewardship Historic St. Luke's could provide. A decision to proceed immediately with restorative treatment without seriously considering these intermediate steps would, I believe, be premature.

2

Beyond Sound: Preserving the Other Voice of Historic Organs

JOHN R. WATSON

We are here to talk about "historic organs," and already, we have a duality. Shall we divide those who place the accent on *historic* from those who place the accent on *organs?* My own past professions of church musician, instrument maker, and restorer, demand one agenda for organ preservation, while my present work as conservator and historian demands another. How can we restore old organs (requiring our altering their evolved state) and protect their historical message (requiring that we not alter them).

A close study of the duality before us has convinced me that we are much more unified in our interests than we might think. In the end, we are all interested in both musical and historical aspects; the common ground is vast.

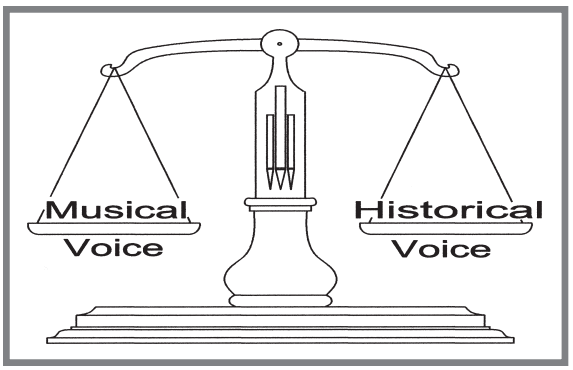

FIG. 2.1. *The restoration of an historic organ involves balancing its musical qualities with its historical qualities. Placing full emphasis on one* voice *puts at risk the preservation of the other* voice. *Only when we devote equal attention to both sets of qualities can we both preserve and restore historic instruments.*

Like all old musical instruments, historic organs have two voices (see fig. 2.1). They have a *musical voice*, and they have a *historical voice*. The musical voice inspires us, moves us, disturbs us, entertains us, and old music on old instruments helps us experience the artistic musical landscape in which our musical ancestors lived. In a powerful way, they instruct us in our disciplined research and rediscovery of period music. Many of the chapters in this collection give exclusive attention to this musical voice. My job in the present chapter is to consider the "historical voice" of historic organs.

Whatever else historic organs might do for us, they have much to tell us about the past. They bear testimony of another time and place. In fact, in the past few years, a whole

new discipline in historical research has developed. In material culture studies, historians turn not primarily to the written documents of history, but to the surviving objects themselves. These historians examine objects to learn all kinds of interesting things about our forebears: how they thought, how they used their time, what they considered important or beautiful, even what they thought about themselves and about each other. For us as organists, organ builders, restorers, organ historians, and lovers of organ music, this means historic organs can be used not only as tools for making beautiful music, but also as "primary documents." Many of us are beginning to read instruments as if they are books, not just for the sounds they make, but for the volumes they speak about the workshops that produced them. In the following paragraphs, I will describe some of the ways my colleagues in Williamsburg and I "read" physical evidence.

To the modern investigator who has learned to read its language, the physical evidence in old instruments tells in stunning detail not only dimensions and precise materials, but also fundamentals of scaling, methods of laying out, procedures of assembly, glues and methods of clamping, the needed collection of tools, and recipes for glues, paints, varnishes and all sorts of finish coatings. The "document" may even describe now-forgotten special tools, revealed in the tracks they leave and other characteristics they impart.[1] This is the historical voice of historic organs. It is as if every instrument came to us with that builder's own illustrated, multi-volume encyclopedia of organ building.

When I first wrote these claims over a decade ago,[2] I had to hope the readers would take my word for it. Since then, however, my research has turned to reading this "virtual encyclopedia." The methods I am talking about are in use by other researchers who are not necessarily specialists in musical instruments. We are not the only ones studying antiques, and we can learn much from methods developed by other material heritage scholars.

I will demonstrate the historical voice of keyboard instruments by showing some examples from research into the eighteenth-century London harpsichord and piano-making industry. The implications are clear for the way we can study organs, and for the way we might preserve the historical evidence in historic organs.

Jacob Kirckman was the preeminent harpsichord maker in eighteenth-century England. When I was commissioned to make a reproduction of a 1760s Kirckman harpsichord for The Colonial Williamsburg Foundation, I set out to learn Kirckman's construction method and design rationale from surviving instruments. I had access to four Kirckman harpsichords, three in Colonial Williamsburg's collection, and another that was in my care from Converse College. So vivid was the information in the antiques that it was almost like

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[1] For an example, see my reconstruction of Jacob Kirkman's tools and methods of work in "An Eighteenth-century Harpsichord Workshop Contributes Two New Technologies," *Eighteenth-century Woodworking Tools*, ed. James M. Gaynor (Williamsburg: Colonial Williamsburg Foundation, 1997), 215-26.

[2] See my "Historical Musical Instruments: A Claim to Use, and Obligation to Preserve," *Journal of the American Musical Instrument Society* 17 (1991): 69-82.

going back to 1762 and serving an apprenticeship in Kirckman's workshop. I will offer a few examples of instruments telling us how they were made.

A close look at the evidence revealed the expeditious process by which the keyboards were constructed. After gluing up the key panel, a grid was struck using scribe lines to define keys with their various features. The key panel was then temporarily nailed to the key frame in two places in preparation for drilling the balance and front pin holes. Figure 2.2 shows the remnant of a nail hole subsequently cut through when the keys were cut apart.

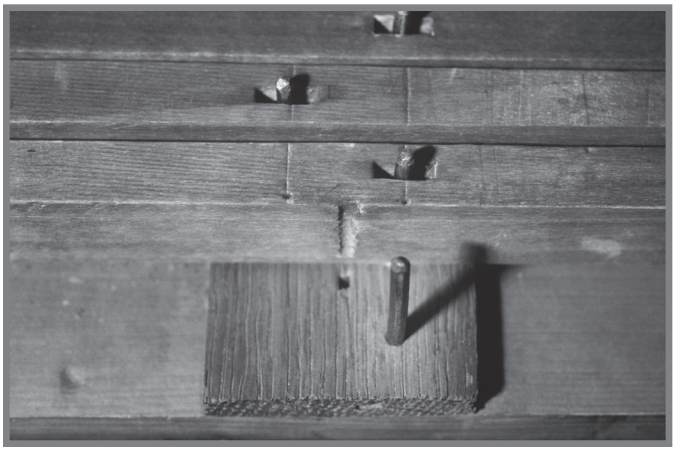

FIG. 2.2. *The keyboard maker marked the location of the centerline of the balance mortises using an awl. After laying out the keys, the key panel was temporarily nailed to the key-frame for drilling the balance pins. The photograph shows the scars which are evidence of the awl and nail in the 1762 Kirckman single harpsichord in Colonial Williamsburg's collection.*

The way Kirckman formed mortises for the front guide pins was the subject of considerably more investigation (fig. 2.3).

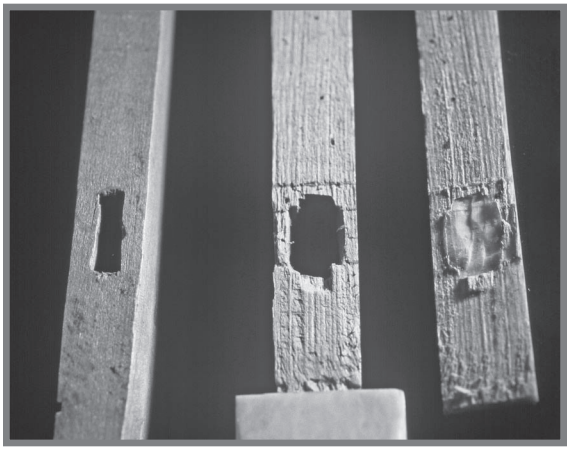

FIG. 2.3. *Left: a key lever at the front pin mortise, showing the underside of the key. Center and right: another key lever showing the top of the front pin mortise with the ivory removed and the ivory turned (on right) to show the underside.*

The bottom of the mortise (on left of fig. 2.3) is neat and accurate where it bears against the guide pin. In contrast, the top of the mortise (at center of fig. 2.3), is rather crude and appears not even to stay within the scribe lines that must have been intended to guide the workman.

How were these mortises made? Why, for example, does evidence of a chisel cut often appear in the center of the mortise (fig. 2.4)? On the assumption that all such evidence should have a pragmatic explanation, the investigation continued. Eventually, we saw in detail the precise method Kirckman used, through a process of examining the physical evidence, experimenting in the workshop, and reexamining the antique. Understanding the interaction between tool and material, this *reexamination* of the antique revealed a whole new level of information.

Kirckman's process is detailed in fig. 2.5. In step 1, scribe lines are struck to guide the work. In step 2, a hole is drilled through the key panel into the front rail. The front pins will be driven into this hole in the front rail. In steps 3 and 4, tool A (a straight chisel) is used to pierce part-way through the panel, the first cut providing chip clearance. The wood easily fractures along the grain between the chisel cuts. In step 5, (viewed from the underside of the key panel) a mortising chisel is used to create the narrow side of the mortise. The drilled hole serves as chip clearance. For now, the critical surface near the balance pin is rough and too narrow. In step 6, a flat punch is used to push the debris out of the mortise, leaving a neat rectangular mortise, slightly larger than the outside scribe lines.

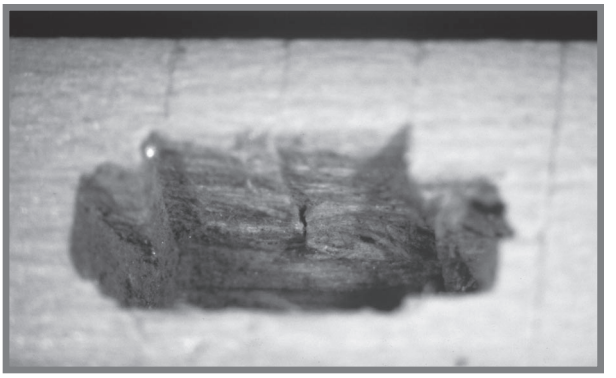

FIG. 2.4. *A close-up view of the inside of a front pin mortise. Note the slight remnant of a straight chisel cut in the center of the mortise.*

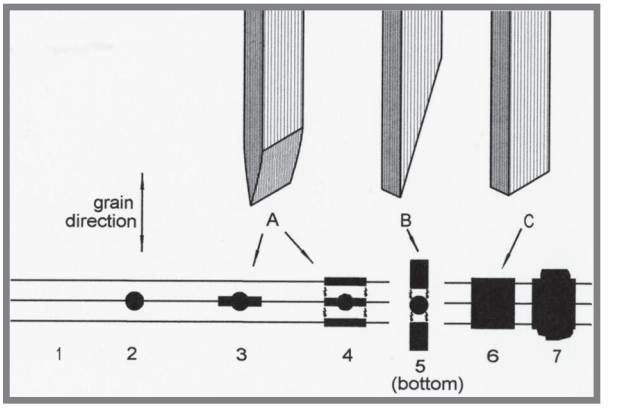

FIG. 2.5. *This is how Kirckman's keyboard makers formed the front pin mortises. Close examination of minute and usually hidden evidence, was tested against workshop trials to reveal, this technique from the Kirckman workshop of 1762.*

There remains the question of what happened between steps 6 and 7 (fig. 2.5). The answer is etched onto the underside of the ivory (fig. 2.3). This final mortising step came after the ivory was glued on and the keys cut apart. Perhaps to clear the mortise of glue squeeze-out, the worker dug out the mortise from below. The vigorous attack necessary to break up the hard glue is recorded in the deep scratching of the ivory.

Cloth has a significant role, affecting the feel of a keyboard action, and the musician's approach to it. Determined to use the "right" cloth in the reproduction, we performed microscopic analysis of fibers from the 1762 Kirckman harpsichord.[3]

How trustworthy was the historical information we found? This instrument was restored in the 1930s by Lotta Van Buren—a colorful character in the twentieth-century revival of early music in America. You can imagine our disappointment when this 1937 description of Lotta Van Buren's restoration work turned up:

> First, Miss Van Buren studies the materials used in the original building of each instrument entrusted to her—and she faithfully keeps to these same materials although the finding of them may cost her endless time and trouble. She would never desecrate an old keyboard instrument by using modern felt. . . . Instead, buckskin and handwoven wool—of not only the same texture but of the original color—are used. At first it was quite a problem to find handwoven wool of the correct shade of green, but now the workshops of the "Lighthouse for the Blind" supply her with just what she needs. She has the pride of every real artist in doing a perfect job.[4]

In Miss Van Buren's well-meaning effort not to "desecrate an old keyboard instrument by using modern felt," she inadvertently desecrated it instead, by confounding its historical voice. Clearly, Lotta Van Buren never dreamed that, sixty-six years later, someone would be doing microscopic analysis of *her* cloth in order to document *Kirckman's* work. At least for the preservation of its historical voice, the most dangerous day in the life of an historic instrument *could* be when it enters a restorer's workshop. In this particular instance, we had the luxury of examining several other examples of Kirckman's cloth to corroborate and correct our conclusions, but the implications for restoration of rare instruments are clear.

The next example was made more poignant because of a 1994 article by Göran Grahn. In his article about restoration ethics, Grahn claimed that re-gluing during restoration could possibly result in loss of traces of original gluing techniques.[5] I wondered if his claim was a just bit far fetched, but an exciting discovery radically changed my mind.

Gluing the ribs to the underside of a soundboard presents a problem in clamping. One old method known to be used by harpsichord makers in eighteenth-century Paris, remains in use by piano and harpsichord makers today. Flexible sticks sprung between

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[3] Linda Baumgarten, Curator of Textiles at Colonial Williamsburg Foundation, assisted in the study of Kirckman textiles, and discovered the reference to Lotta Van Buren's reproduction cloth.

[4] From the radio program, "So You Haven't the Time?" by Alice Pentlange, Station WQXR, New York, 26 May 1937, as quoted in Larry Palmer, *Harpsichord in America* (Bloomington: Indiana University Press, 1989), 43.

[5] Göran Grahn, "Should we stop restoring and playing original instruments?" *Harpsichord and Fortepiano* 5, no. 1 (October 1994): 27-28.

ceiling and work apply the needed pressure. Period French sources call these sticks "goberge," conveniently translated "go-bars" since they "go" from the ceiling to the work.[6] It has been popularly believed that the English did not use go-bars for gluing, there being no written reference to them in the literature. Now, thanks to the historical voice of at least one antique harpsichord that had not been much restored, we know go-bars were indeed used in England.

See figs. 2.6 and 2.7 and their captions for the evidence and the interpretation. Again, practical workshop experience and testing inform our examination of the antique. Again, critical technological evidence would have been falsified or lost completely if the ribs had been re-glued during past restorations, since a restorer could have left the evidence. You can see in this example that the more extensive a restoration, the more historical evidence is contaminated and rendered unreliable.

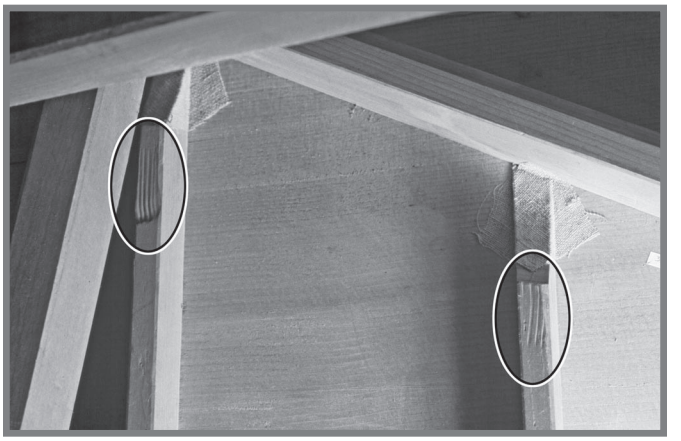

FIG. 2.6. *Left: raking light reveals evidence of Kirckman's method of gluing ribs to a soundboard. At the ends of the ribs, and at appropriate intervals, are the distinct impressions of go-bars. This is the first known evidence to indicate that go-bars were used in eighteenth-century English instrument workshops.*

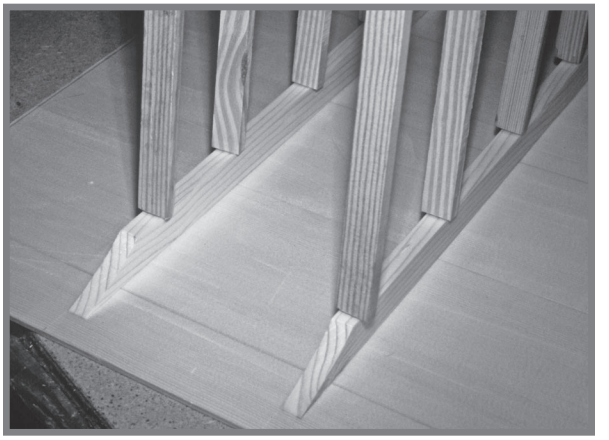

FIG. 2.7. *Go-bars in use on the reproduction. The quarter-sawn grain of the go-bars gives them better stiffness and resistance to breaking. The alternating soft early wood and hard late wood of the annual rings can cause the rippled effect seen in fig. 2.6.*

[6] See Grant O'Brien, *Ruckers: A Harpsichord and Virginal Building Tradition* (Cambridge: Cambridge University Press, 1990), 107, n. 11. Andre Felibien's illustration in *Des principes de l'architecture* is reproduced in Scott Landis, *The Workbench Book* (Newtown, Conn.: Taunton Press, 1987), 112.

The decorative and protective coatings ("finish") on old instruments are often the first to go in a restoration. Material heritage scholars, however, have begun to pay a great deal of attention to the history that is painted and embedded on the surfaces of old objects. The study and conservation of historic surface coatings on furniture are the subject of new technologies and conservation methods.[7]

The French polishing of period English furniture was an invention of the early nineteenth century, and nearly all English harpsichords were subsequently finished this way. Surviving original coatings from before the advent of French polishing are almost not to be found on eighteenth-century furniture. What evidence of the original coating might survive, and how can it be analyzed?

One of the four harpsichords in the study had a clear historical voice, thanks to the best kind of benign neglect. When this harpsichord had been refinished, the work-man neglected to first remove the hinges, undoubtedly more for lack of effort than to preserve historical information. In fact, this instrument showed convincing signs that the hinges had *never* been off—a very unusual and valuable condition! I removed just one of the lid hinges, leaving the ten others to remain untouched. I found heavy deposits of dirt and odd coatings that had seeped under the hinge, and an area of what may well be unaltered original finish (fig. 2.8).

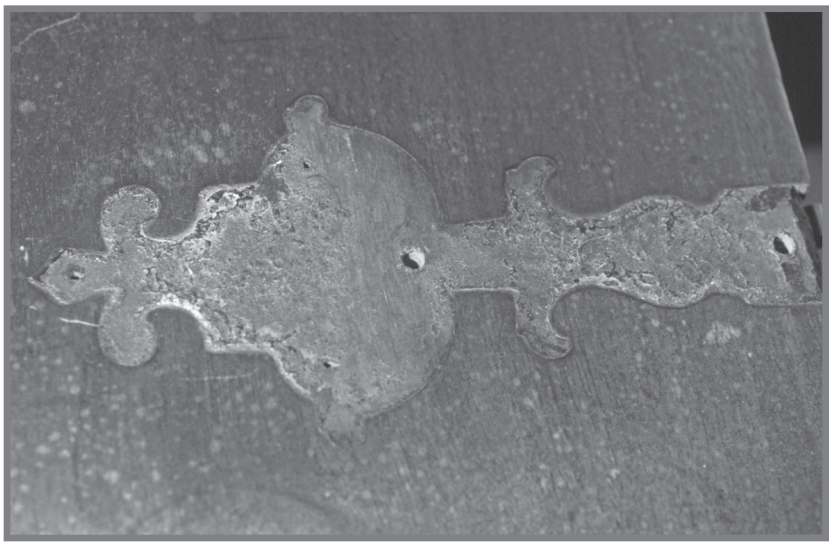

FIG. 2.8. *Detail of lid, 1762 Kirckman harpsichord. One of the hinges is removed revealing an early surface.*

[7] See, for example, *Painted Wood: History and Conservation*, ed. Valerie Dorge and F. Carey Howlett (Los Angeles: The Getty Conservation Institute, 1998).

Today, it is common practice in conservation laboratories to examine a sample of a finish no larger than a pinhead. The sample is embedded in acrylic resin, split into a cross section, and examined under a microscope. By selectively applying various chemicals and examining under normal and special light, it is possible to identify each layer of finish from the earliest to the most recent. Pigment and binder can often be determined, as well as date parameters.

Because the coating did not fluoresce, we knew it was not shellac—the coating commonly added to English furniture in the early nineteenth century. However, the single layer did dissolve easily in mineral spirits. The tests strongly suggested this harpsichord began life with a finish of wax alone.

The analysis thus shed light on a part of the visual aesthetic of eighteenth-century harpsichords that survives so rarely as to make this un-restored English instrument "speak" for all the rest. This is one of dozens of examples of how antique instruments are documents with "fine print" that bears witness to the historical workshop. We can be forgiven for not always hearing the "historical voice" of old organs. As we are seeing, sometimes it takes a microscope to read the evidence!

FIG. 2.9. *The rare survival of some gilding on the lower left of this iron screw head is the first evidence of a visual aesthetic that could have been standard in the period. Usually, well-meaning "maintenance" has long ago polished away this last whisper of historical evidence.*

The spectacular brass hinges of English harpsichords have usually attracted so much enthusiastic polishing over the years that we had no reason to suspect their iron screws began life with gilded heads. Fortunately, the 1762 Kirckman had escaped generations of over-cleaning. Notice in fig. 2.9 the glint of gold on the edge of the screw. This was our only clue that this visual aesthetic existed in eighteenth-century English instruments, and it could have been quite prevalent.

Every bit of new historical information comes with a new set of ever-more informed questions. The thought of gold screws in brass hinges sounds a bit odd. Would not the brass of the hinge appear a bit drab in comparison to the gold screws? We know clock-makers routinely used tinted coatings on brass to simulate gold. It seems likely, then, that the gilded screw heads indicate that the brass hinges were gold-tinted. Thanks to some very vulnerable evidence left behind by so much benign neglect, a visual picture begins to emerge of what these instruments looked like when they were new.

* * * *

A single, thorough restoration of the 1762 Kirckman harpsichord could have wiped out most of the historical evidence we have been considering. Moreover, even though Kirckman was the most productive harpsichord maker in the eighteenth century, the evidence we have presented is so vulnerable to loss or falsification, that some of it could be the last surviving evidence of its kind.

Individually, these little discoveries may seem insignificant, yet they add up to a window on the past. The less intrusive our restorations can be, the clearer will be the picture of not only the historical workshop, but also of the people who first made and played the instruments. While the historical voice is not all directly *musical* in nature, it does reveal the craft tradition that produced the instrument. Thankfully, we are beginning to learn how much influence the mundane details of period craft technique had on the mechanical and musical design of historic instruments.

Another implication of the Kirckman study has to do with the making of instrument "copies." Copies are often maligned as the work of people who do not know for themselves the first principles of instrument making. The usual pejorative term "slavish copy" is intended to imply lack of will, knowledge, and insight by the maker. An eminent American organ builder recently encouraged a gathering of aspiring organ builders to "copy a rank of old pipes . . . eventually you will understand it and can design your own." Making copies, however, can educate more than the novice, and the reluctance of any instrument maker to closely copy the work of history's best builders is a rejection of historical knowledge that cannot come from any other source. Workshop testing of historical designs and methods greatly informs the examination of old instruments. Moreover, this kind of technological archeology is really effective only when copies are historically accurate in sufficient detail.

Organs have an unbroken tradition of use, and are often an architectural part of a building. They also differ from other historic artifacts in having a social function to fulfill, when they exist as a congregation's primary instrument. There simply is not a reasonable option to leave most old organs un-restored for reasons of preservation, and only the most narrow-minded conservation fundamentalist would argue that they always should.

But neither is it appropriate or necessary to disregard and freely sacrifice an instrument's historical voice in order to optimize the musical voice. *This is the good news.* There is a growing repertoire of minimally intrusive restoration techniques, some of them exploiting current science and technology. It is urgent that we collaboratively discover ways we can perform restorations of historically significant organs using methods that will respect and protect this nonrenewable resource of historical information.

Museums are, in effect, research laboratories, developing new ways of reading the historical content of historic objects, and developing new ways of preserving the vulnerable historical evidence on which organ historians and builders depend.

Whether the objects in our care are to be made functional or preserved in their evolved state, the mandate of conservation (in the present context) is preservation of historical information. It should be clear from the examples above that the historical "voice" is vulnerable to loss during restoration. Yet restoration of some kind is essential for the great majority of historic organs. Conservation specialists have developed new approaches that get the restoration job done, but with great emphasis on also protecting period evidence. This form of restoration differs from traditional approaches, and is more properly called restorative *conservation*.[8]

It is certain that nearly all historic organs should be maintained in playing order, with occasional restorations to keep clear their musical voice. Can any instrument, however, be so rare and important that it should be "protected" from restoration? The following case study about a piano offers a compelling answer.

The piano in fig. 2.10 is one of four known English pianos made in 1766. It represents the beginning of piano making in the English-speaking world. For scholars of our English-American keyboard heritage, this piano could hardly be more important as an artifact. When the instrument came into Colonial Williamsburg's collection in 1968, it was promptly turned over to a restorer for complete musical restoration. We all thought back then that restoration was a museum's obligation for musical instruments.[9] Apparently distracted by other things, the restorer eventually stopped answering our calls and letters. On a lead that the man's things had been thrown out by a disgruntled landlord, a private investigator hired by Colonial Williamsburg, sifted through the city dump.[10] The piano was eventually found—thankfully not in the dump. The restorer had not gotten around to starting any work.

The piano sat in storage in Williamsburg another twenty-five years while we grew gradually more desperate to hear what it sounded like—and for good reason. In 1771, the same year as the first public piano performance in America (Boston), another piano performance occurred here in Williamsburg. We had the building where the concert took place, we had a first-rate forte-pianist on staff, we had a constant flow of enthusiastic audiences, we even had a period piano of exactly the right type and enough money to restore it. You cannot find a stronger musical motive to restore an antique instrument.

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[8] For examples of restorative conservation methods applied to organs, see my article, "Conservation of Six Historic Organs at Colonial Williamsburg," *The Tracker* 46, no. 3 (July 2002): 22-34.

[9] In the previous year, the International Council of Museums had published *Preservation & Restoration of Musical Instruments: Provisional Recommendations* by Alfred Berner et al. (London: International Council of Museums, 1967). The chapter, "Restoration of Instruments" begins with the phrase, "Where possible the restoration of a deteriorated instrument is commendable. . . ." Note the word "provisional" in the subtitle of the book. The book was superceded in 1993 by *Recommendations for the Conservation of Musical Instruments: An Annotated Bibliography,* published by CIMCIM, a subcommittee of ICOM, the original publishers. The newer publication acknowledges the potential loss of evidence that comes with restoration, and encourages a more discriminating policy of restoration.

[10] The investigation report and other details of the incident are in the files of the Colonial Williamsburg Department of Collections.

FIG. 2.10. *This piano is from the first year of production by the first piano maker in the English speaking world–Johannes Zumpe, 1766. It is not restored, and has not been heard by any living person. Nevertheless, its historical voice has dictated every physical detail, design principle, and workshop method, in the making of a copy. The same historical information is also soon to be published for mass distribution.*
Photograph by Hans Lorenz, The Colonial Williamsburg Foundation

In the years since acquiring the piano, however, our respect for the instrument's historic integrity grew just as much as our desire to hear it played. A sports metaphor might say it best. What becomes of an aging football star? If he is kept on the playing field, it will kill him, but if he is given the new career of coach, he can continue to serve with his rare ability by training a generation of new athletes. So it is with most museum artifacts.

We decided to make a copy of the piano (fig. 2.11). It was my great privilege to extensively study the antique and make the reproduction. As we have seen, the act of making a close copy informs our examinations, and reveals great quantities of technical information. We learned far more than the dimensions of the parts. We also came face to face with the principles of laying out an instrument, the tools and methods of construction, and even the maker's hierarchical treatment of the different aspects of the instrument—clues of his values and thought processes.

FIG. 2.11. *The author's copy of the 1766 Zumpe piano. It is frequently heard by hundreds of visitors to the Raleigh Tavern in Williamsburg where such a piano was used in 1771, within months of the first known public piano performance in America.*
Photograph by Hans Lorenz, The Colonial Williamsburg Foundation

Now we have the best of both worlds—an uncompromising historical voice, and an uncompromising musical voice. We have the pristine historical document, complete with its original ephemera like cloth, leather, and strings, and we have a very accurate copy to play. We also have a substantial archive of drawings and technical notes about piano construction in London in 1766. The historical information captured from the instrument amounted to a transcription of its "historical voice"—a never-ending narrative that picks up where it left off on every reexamination. Some might call the imposed silence of the antique instrument a travesty, but when they learn to hear the historical voice, it will not occur to them to think of the instrument as "silent."

In several ways, the reproduction is more like the original instrument than the antique has become. Notice that the lock board of the reproduction is hinged to the front of the case rather than to the lid as on the original instrument. Here, the reproduction interprets the evidence of original state. Restoration of the antique to an earlier state would have removed evidence of a design evolution, leaving only the precarious written record to tell the whole story.

Is there a chamber organ in the United States of such rarity and historical significance that it, too, should be given its musical voice through reproduction rather than restoration? If we say "no" today, will we change our minds in coming years, after we have imposed our interpretations on the ancient instrument?[11]

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[11] In the exceptional case of the St. Luke's organ this chapter has encouraged ultimate preservation through retirement of the instrument. In my forthcoming book on conservation of historic organs the emphasis is on restorative conservation, rather than retirement, of working historic organs. For information about the publication, see http://www.PreservationTheory.org/aiu.htm.

3

The Restorer and the Conservator: Deconstructing Stereotypes

R. L. Barclay

The tensions between the use of historic musical instruments and their preservation in a nonworking state are well known. A distancing of views has proceeded to the point that hardened positions often preclude constructive dialogue. A culture of opposition has emerged. This tension is continued unconsciously in the actions and rationales of treatment, and in the roles that historic musical instruments play in modern society. There are now two opposing camps: those who wish to give full expression to historic musical instruments by playing them, and those who wish to preserve them as silent documents for study. This is a classic polarity, under which we have been laboring for decades. This division into two isolated and hardened disciplines is, in fact, false and artificial, and it has contributed to anguish and misunderstanding for far too long. It has resulted in the conception and entrenchment of two invidious stereotypes: the restorer bristling with wood- and metal-working tools whose goal in life is to restore at all costs; and the anal-retentive conservator with the white coat and gloves, the holier-than-thou El Greco eyes, and the hands-off attitude. Caricatures of both these types are regularly encountered, and there is therefore a tendency to "buy in" automatically to the stereotypical framework that they represent. We see two regimens of action, and very little working space between them where dialogue might take place.

As these stereotypes are actually a hindrance, and prevent us from reaching consensus on the care and preservation of such historic objects as the Smithfield organ, they need to be reexamined. This chapter will examine the fundamental soundness of the assumptions that underlie this tension, and propose a new framework within which actions upon historic musical instruments can be viewed. It will show that this bipolar tension is actually a societal construct, and that action superimposed upon the archetypal musical instrument craft activity should, in fact, be divided into three distinct regimens of function, not two. These regimens are termed *Currency*, *Restitution*, and *Preservation*:

The author is indebted to Carmelle Bégin of the Canadian Museum of Civilization for permission to publish details of the *Opus* exhibition, to the curatorial staff of Residence of the Governor General of Canada for allowing access to their files, and to Timothy Maloney of the National Library of Canada for providing information on Glenn Gould's Steinway piano.

- *Currency*: the instrument is already in working condition and continues in use, being maintained and adapted to suit changes in musical fashion.
- *Restitution*: the instrument is not in working condition, and is "returned to" and maintained in a state that is assumed to represent some previous period of its existence.
- *Preservation*: the instrument may or may not be in working condition, but its current state is respected, and it is preserved from either restorative treatment or musical use.

These terms have been chosen very carefully for two reasons. Firstly, the two existing terms—*restoration* and *conservation*—evoke exactly the polarizing sentiments that need to be reexamined. When the terms *conservator* and *restorer* are used, the caricatures they signify spring to mind. Secondly, the term restoration is used arbitrarily to describe all manner of very different treatments that can be applied to historic instruments. Its very lack of specificity makes it useless as a descriptor of the rationales that underpin action. As an example, a violin "restorer" who keeps valued instruments in playing condition is working under an utterly different set of values and assumptions than a keyboard instrument "restorer" who is bringing derelict and much-changed instruments back into a semblance of their earlier states. The actions of these individuals may be very similar, and their tools and techniques essentially parallel, but their rationales are far distant. Yet the roles of these two individuals are conflated as "restoration" simply because only their actions are commonly viewed.

If this shared *intervention with tools* is examined from the point of view of its underlying rationales, *restoration* is correctly divided into two kinds of action, and the schema of three regimens described above therefore becomes apparent. Action within each of these three regimens is circumscribed by the social milieu through which its values and attitudes are directed. When historic instruments are treated, the underlying craft tradition is informed by the sets of values associated with the social/historical backgrounds of its practitioners. Clearly, if an historic instrument is to be kept in working condition, the values appropriate to that action will predominate. If it is to be restored to some postulated previous state, a second set of values will apply. A third set of values comes into play if the instrument is to be preserved in a nonplaying state. Thus, the social framework within which the person or persons who decide upon the manner and level of treatment live and work will circumscribe the limits and types of action taken upon the instrument.

This schema can be represented in a matrix that illustrates actions and rationales in the three regimens (see table 3.1).

The use of the term "maintenance" to describe all actions in Currency needs especial clarification; it distinguishes action in this regimen from *restoration*, an action *only* occurring in Restitution. Thus, any action in the regimen of Currency on an already working historic instrument, no matter how invasive and transforming it may be, is titled "maintenance." As an example, the action of re-necking a violin in order to modernize it is in line with

TABLE 3.1. The three regimens shown in the form of a matrix

	The **actions** adopted by those who subscribe to the values of a regimen	The **rationale** adopted by those who perform actions in a regimen
Currency	The instrument's continuity is maintained through physical intervention. Alterations and improvements are made so the instrument can continue in use. The instrument can be transformed as the needs of the player dictate. All action is termed *manintenance*.	Subjective attributes are assigned to the instrument, and achievements of makers makers and users are imbued with emotional value. Physical transformation of the instrument is not seen to interfere with its subjective attributes.
Restitution	The historical context of the instrument is re-created by returning it to a projected previous state. Craft intervention results in alteration and substitution of the original materials. Action is termed *restoration* and is followed by *maintenance*.	There is positivistic belief in the possibility of recapturing a definitive previous state of the instrument. The instrument is used as a medium in recreating a past cultural ambience.
Preservation	The integrity of the instrument is preserved by maintaining its present state without indelible intervention. Scientific methods are employed to safeguard and document the instrument. Action is termed *conservation treatment*.	Application of the scientific method to the study and preservation of the instrument reflects pragmatic thinking. Subjective responses are relegated to the status of current information.

"maintaining" the currency of the instrument. Restoration, on the other hand, now refers specifically to actions taken to "represent a known earlier state."[1]

Rationales are the most important aspect of this categorization. Practitioners, whether they be instrument restorers, repairers, or conservators, tend to be very conversant with actions, because that is their focus. As a result, there is a tendency to be rather non-analytical regarding the rationales that underpin and define their actions. This makes both criticisms and justifications of each other's work rather fragile and open to question. Analysis of rationales through a deeper understanding of historical and social context tends to free practitioners from this bias.

Illustrating the Three Regimens

As an illustration of how this schema might be applied to an historic instrument, the history of a *pardessus de viole* (five-string soprano viol) from the Hôpital Général de Québec will be briefly described. According to the account of Nazaire LeVasseur (a commentator

[1] International Institute for Conservation–Canadian Group and Canadian Association of Professional Conservators, *Code of Ethics and Guidance for Practice*, 17.

upon musical practice in nineteenth-century Québec) masons working upon restorations in the Hôpital Général around 1859 noticed that one wall of the room in which they were working sounded hollow.[2] The masons sought permission to investigate the hollow sound and, on demolishing the wall, found a vault constructed for hiding provisions and other valuables during attacks by "savages and, later on, the Anglo-Saxons."[3] In this recess were a dozen musical instruments of six strings, which LeVasseur says were identified as viols and bass viols made by Nicholas Bertrand, the early eighteenth-century luthier of Paris.[4] Several of the instruments fell to pieces once exposed, but four remained in sound condition.[5]

The superintendent of the hospital was apparently not disposed to consider the cultural worth of the instruments, and so parceled them out to several dealers, collectors, and musicians in Québec. She is described by LeVasseur as one who was "not an antiquarian and had no interest in the curiosities of the world from the perspective of her cell."[6] LeVasseur bemoans this lack of foresight from his perspective of sixty years later, and, furthermore, blames the absence of a public museum in Québec City at that time on a lack of public spirit. It is for this reason, he says, that the historic relics of Québec "fly to the four cardinal points of the continent."[7]

This is the first cusp in the history of the viols since their discovery; they wait at a point where the decision of an individual dictates the regimen into which they will fall. Had the instruments been either bequeathed to an institution or retained by the hospital, and been preserved from further intervention, the regimen of Preservation would have been followed. In that case, the instruments would have been treasured for their intrinsic value as static signifiers of the early days of New France, and preserved in their found condition. This did not actually happen.

One of the instruments, a *pardessus de viole*, was given by the superintendent to a blind resident of the Hospital, a boy who played the violin exceptionally well. Joseph Lyonnais, a luthier of Québec City, furnished him with strings, rosin, and other needed items, and LeVasseur reports that the boy played Scottish reels, hornpipes, waltzes, and "La Belle Catherine" upon the instrument using the four top strings.[8] The viol did not

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[2] Nazaire LeVasseur, "Musique et musiciens à Québec," *La Musique* 1-2 (1919): 14-16. (LeVasseur says that these events took place sixty years earlier: "il-y-a une soixantaine d'annés aujourd'hui," 14.)

[3] "des sauvages, et, plus tard, des Anglo Saxons": LeVasseur, 14.

[4] Ibid.

[5] In a recent critique of LeVasseur's account, Vivianne Emond has studied the disposition and current location of these instruments and corrected many errors of dating. See Emond, *"Musique et Musiciens a Québec: Souvenirs d'un Amateur" de Nazaire LeVasseur (1848-1927): Étude Critique*, Mémoire présenté pour l'obtention du Maître en Musique, Université Laval, 1986.

[6] "Qui n'était pas une antiquaire et que les curiositiés de ce monde n'intéressaient pas au fond de ca cellule," *LeVasseur*, 15.

[7] "Opèrent constamment une fugue aux quatre points cardinaux du continent": *LeVasseur*, 16.

[8] Ibid., 15.

work very well for him, however, so he approached Lyonnais again, and asked him to convert the instrument into a violin. This is this second point of decision in the life of this instrument; the second cusp in the viol's fortunes.

Had Joseph Lyonnais taken the instrument into his repair shop and replaced the neck, so it could be played comfortably as a violin, the instrument would have fallen into the regimen of Currency. The projected conversion from viol to violin follows a long-established craft practice common in the nineteenth century.[9] The intention of such conversions is to *maintain* the instrument's continuity through physical intervention. Irreversible alterations would have been made so that the instrument could continue in use, and it would have been transformed in consequence. This did not happen either.

Since most of the instruments recovered from the hospital had fallen to pieces once exposed, those surviving must have required extensive treatment in order to make them playable. This is borne out in the case of one of the instruments, the 1720 Bertrand bass viol. The instrument now bears, in addition to its maker's label, a manuscript label stating that Joseph Lyonnais had made repairs in 1865 and that his son, Roch, had made further repairs in 1916.[10] LeVasseur describes the elder Lyonnais abandoning repair work on the bass viol due to the extreme porosity of the wood, and his son subsequently repairing the instrument completely using cotton ribbons and hide glue.[11]

Rather than following the blind boy's request by converting the *pardessus de viole* to a violin, Joseph Lyonnais offered a new small violin in exchange. In recounting this transaction, Roch Lyonnais cites the motivation for the trade being his father's opinion that the conversion would be impossible.[12] However, financial gain was probably an equal motivator. Three of the instruments had been purchased by a Montreal merchant, William Snaith, for fifty dollars, a very large sum in 1864. He had bought three "very old Instruments from the Ladies of the Convent of the Hospital General [. . .] in 1864—who had imported them for use in the Convent choir, before the conquest of Canada."[13] These three viols were later exported to the United States and are now in the Metropolitan Museum in New York.

So, although no specific documentation of extensive treatment of the *pardessus de viole* exists, the provision of new strings, noted by LeVasseur, alone is indication of a desire for playability. Thus, the third point of decision in the *pardessus'* s life occurs. The action points towards *restoring* working condition, and such intervention to effect playability

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[9] Olga Adelmann, "Experiences in Restoring at the Musikinstrumenten Museum in Berlin," in *Day of Studies on the Restoration of Stringed Instruments* (Cremona: The Committee for the Preservation of the National Stringed-Instrument Heritage, 1976), 115.

[10] Emond, 39.

[11] LeVasseur, 15.

[12] Ibid.

[13] William Snaith, letters to the Metropolitan Museum, 19 December 1898 and 2 January 1899, Archives of the Metropolitan Museum, New York.

is considered a prerequisite of treatment of the surviving viols. The intention is to return the instruments to the state in which they were used before their incarceration, and to treat them as working, musical signifiers of a time before the English conquest of Canada. These rationales therefore situate the *pardessus* and the other viols in the regimen of Restitution.

This brief history shows the way in which the rationales of individuals, in the historical and social context in which they live, dictate the fate of the instruments under their control. The following matrix shows the decisions surrounding the *pardessus de viole* in graphic form (table 3.2).

TABLE 3.2. Decisions over the *pardessus de viole* represented in the matrix

	The **actions** adopted by those who subscribe to the values of a regimen	The **rationale** adopted by those who perform actions in a regimen
Currency	It was requested that the *pardessus de viole* be converted into a violin in order to make it easier to play and more easily useful for the owner's repertoire. *This plan was not carried out.*	The rationale for this action is based in the utility of the instrument and the potential for updating as changes in musical fashion dictate.
Restitution	The *pardessus de viole* was exchanged for a new violin, thus keeping it in its original state. *This was the path chosen.*	A definitive previous state of the viol is achieved. Although the commercial aspects of the transaction are evident, a authentic experience is the rationale.
Preservation	Had the Superintendent of the Hospital recognized the historical attributes of the instrument it would have been preserved as a museum piece. *This direction was not followed*	At the period in which the transaction to museum status could have taken place, the climate of thought was predominantly towards use, rather than preservation.

The above brief case study is a prelude to a slightly deeper examination of the way in which placing instruments into this schema elucidates what was done to them, and why it was done. Case studies and accompanying analysis of two Steinway pianos owned and used by Canadian pianist Glenn Gould, and an exhibition of recently made musical instruments, are presented below.

Currency: Steinway Piano

History

Canadian pianist Glenn Herbert Gould possessed several pianos which he used for concerts, recordings, and practice. The instrument described here is a Steinway 6'11" grand piano built in 1934. It was initially owned by Steinway and Sons and leased to various artists as part of the firm's Concerts and Audit collection. Glenn Gould purchased the instrument from Steinway, and on his death in 1982 the executors of his estate offered

the instrument for sale. It was then purchased by the administrators of Rideau Hall, the residence of the Governor General of Canada. The rationale for acquisition was as follows: "Such a historic piece would be seen by many visitors each year and it would receive the regular use necessary to prevent its deterioration."[14]

Gould had very particular requirements of his instruments, their set-up being very different from that of standard concert grand pianos. In particular, he required very bright hammers (i.e., with hard felt), a let-off as close to the strings as possible—in the order of 1/16"—and a very shallow touch (also known as dip or draft) of approximately 3/16".[15] The value for key draft is half of that normally specified by Steinway and Sons.[16] Gould speaks of "the alignment of such essential mechanical matters as the distance of the hammer from the strings, the 'after touch' mechanism, etc." as being of importance in freeing the piano from its "natural tendency."[17] Elsewhere, he likened the factory set-up of pianos to the automatic transmission of a car. He was also less than careful of the furniture aspects of his pianos; a patina gained through energetic use is a characteristic of his instruments.

The instrument was sent away by the Department of Public Works for thorough refurbishment. On examining the instrument in his Ottawa workshop, the craftsman's findings were reported as follows:

> Was Glenn Gould an aggressive pianist? After examining the battered state of the late musician's Steinway, Ottawa restorer Kenneth Lauzon thinks so. Lauzon was hired by the federal government last week to restore the fifty-year-old grand, which it purchased from Gould's estate for $12,500. The piano will eventually be installed in Rideau Hall, the residence of the governors general. "In 22 years of restoration I have never seen anything like it," said Lauzon after surveying the damage. Two layers of veneer are scraped from the name board. The strings are worn out. The harp that holds them needs re-bronzing, and Lauzon plans to strip and repaint the entire piano. "It looks as if the beavers got at it," said Lauzon.[18]

So, the Steinway was entirely stripped down, all mechanical parts were serviced or replaced, the metal frame was re-bronzed, and the case was stripped to the bare wood, repaired, and refinished with "six or seven coats" of black lacquer. The instrument was

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[14] Donald MacSween, letter to Esmond Butler, 11 January 1983, records of the National Capital Commission, Ottawa.

[15] Maintenance record, National Library of Canada, file number 168-3-G9-6: Collections: G. Gould, piano maintenance, vol. 1.

[16] Max Matthais, *Steinway Service Manual* (Frankfurt-am-Main: Verlag Erwin Bochinsky, 1990), 88.

[17] Liner notes to *J. S. Bach: Two- and Three-Part Inventions*, Columbia recording ML 6022, quoted in Geoffrey Payzant, *Glenn Gould: Music and Mind* (Toronto: Key Porter, 1994), 106.

[18] *Maclean's Magazine*, 11 April 1983, p. 33.

re-strung and tuned, hammers and dampers were re-felted, and the action was adjusted. In the context of this chapter, all this work falls under the description of maintenance; there is no attempt to recapture the instrument's used state or, what is more significant, to reuse or reproduce original parts.

None of the work described above was documented either in writing or graphically; the instrument was, in the words of the restorer, "treated like any other piano" in need of refurbishment.[19] The only extant record of this treatment is a series of 4" x 5" color photographs mounted on a panel. On return to Rideau Hall it was intended that a metal plaque be attached to the instrument above the keyboard. In commenting upon this proposal, an official of the Museum of Man in Ottawa stated that "it's ironical to remove all evidence of Glenn Gould and then put a plaque on it saying it is his."[20] In answering this criticism, the Public Works Project Manager stated that "it's not being bought as a museum piece. It was offered to us on the condition it be restored as a musical instrument."[21] The refurbishment was criticized by the conservation community in the following terms:

> We must overcome this outdated notion that our history, our great achievements, and our heroes must be without flaw. For it is the patina that recalls these events and men. From it we come to understand what greatness is.
>
> This piano's keyboard reflects the thousands of hours of practice that Mr. Gould struggled through to reach his perfection. As such these scratches and flaws reflect perfection much more than seven perfect coats of lacquer ever will.[22]

Glenn Gould biographer Geoffrey Payzant wrote that:

> The piano is being rebuilt at public expense so that all traces of the characteristics for which Gould loved it will be carefully removed; it will occupy a place of honour in the official residence of the Governor General as a memorial to its former owner. A government official has announced that it will be in such good condition that Gould himself would not have been ashamed to play it in public. The many levels of irony and absurdity in these projects would have delighted Glenn Gould.[23]

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[19] Kenneth Lauzon, transcript of personal communication to author, 14 June 1995.

[20] Julian Beltrame, "Discord sounded over restoration of Gould piano," *The Ottawa Citizen*, 23 April 1983, p. 9.

[21] Ibid.

[22] Richard O. Byrne, Richard, O. and Martin E. Weaver, "Piano scars reflect perfection," *The Ottawa Citizen*, 3 May 1983, p. 8.

[23] Payzant, 146.

Analysis

Currency appears in the suggestion that acquisition of the piano for Rideau Hall is based upon its utility as a musical instrument. An assumption throughout the correspondence is that the instrument would be used on a regular basis and maintained in a working state—"a piano will deteriorate if not used" is the way it is put. The Steinway piano's association with Glenn Gould made it a desirable acquisition, and plans to perpetuate this historical association included a tangible signifier in the form of the plaque to be attached to the instrument, together with its continuing use as a monument to Gould. It is clear that the removal of all characteristics of Gould's possession from the instrument in no way detracts from its attraction in the eyes of those who did the work. It is still Glenn Gould's piano regardless of the transformation it has undergone (fig. 3.1).

FIG. 3.1. *One of Glenn Gould's Steinway pianos, now in the ballroom of Rideau Hall, Ottawa.*
Photograph by the author and used by kind permission of the Residence of the Governor General of Canada

The musical context of this transformation is of interest. Glenn Gould's influence upon the pianistic interpretation of Bach's keyboard works was seminal; "he redefined what it means to play Bach on the piano."[24] It has been argued that his creative aesthetic "implies a rejection of 'authenticity' and thus challenges many of the premises and orthodoxies

[24] Hellmut Kallmann and G. Potvin, eds., *Encyclopedia of Music in Canada*, 2nd ed. (Toronto, Buffalo, London: University of Toronto Press, 1992), 542, col. 3.

of the historical-performance movement."[25] In the sphere of influence in which he made his music, where valid interpretation of earlier music on modern instruments prevails, the values of Currency find a comfortable fit. "His insistence that the performer's role is properly creative, rather than recreative,"[26] is indicative of the process of continuity, where there exists, in David Lowenthal's phrase, a "living past bound up with the present."[27] In this context, the attitudes towards the Steinway piano, representing a constantly renewable and functional resource, are unarticulated reflections of this prevailing orthodoxy.

Currency is signified by both the recognition of the tangible evidence of Glenn Gould's ownership, and by its subsequent obliteration. Treating the instrument "like any other piano" in need of treatment demonstrates the application of the craft tradition in assuring diachronic continuity. The processes of removing the marks of usage on the keyboard fascia, readjusting the action, replacing working parts such as hammers and dampers, re-bronzing the harp, and stripping and refinishing, are all marks of Currency in action. There are elements here of what nineteenth-century art critic John Ruskin referred to as the pathetic fallacy. In describing certain historic Venetian buildings, Ruskin said that:

> In many instances, the restorations or additions have gradually replaced the entire structure of the ancient fabric, of which nothing but the name remains, together with a kind of identity . . . the Will of the old building asserted through them all, stubbornly, though vainly, expressive.[28]

In this passage Ruskin is subscribing to the prevalent belief from the late eighteenth century onwards that works of art and craft accrued an essence independent of their materials of fabrication. Ruskin himself coined the term pathetic fallacy, and described it as follows:

> The difference between the ordinary, proper, and true appearance of things to us; and the extraordinary, or false appearances, when we are under the influence of emotion or contemplative fancy; false appearances, I say, as being entirely unconnected with any real power of character in the object, and only imputed to it by us.[29]

This thinking had become imbued into the collective consciousness by the influence of the writings of Goethe, Wordsworth, and Collins, among others. Buildings, to Ruskin, had a will of their own, and it is clear that wholesale replacement of the fabric does not necessarily dilute or mask this intangible phenomenon. Neither does it detract from buildings

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[25] Ibid.

[26] Ibid.

[27] David Lowenthal, *The Past is a Foreign Country* (Cambridge: Cambridge University Press, 1985), 62.

[28] John Ruskin, *The Stones of Venice* (Orpington, Kent: George Allen, 1886), 1:vii.

[29] John Ruskin, *Modern Painters* 3, no. 12 (New York: John Wiley and Sons, 1879): 154.

as objects to be revered and cherished. How well this thoroughly consistent nineteenth-century philosophy fits with the treatment the Steinway underwent! And how well, also, it fits with the music of Bach played on the instrument.

Clearly the essence of Glenn Gould—what makes this piano special—is independent of its materials of fabrication and their particular disposition. And more to the point, this invasive and thorough treatment was not done in ignorance. There are certain profoundly held beliefs here: the belief that a beautifully refurbished Steinway is reverential to Gould's memory, that a piano will deteriorate unless used, and that it is not a static museum piece, but a musical instrument. Those who counsel preservation will not appreciate this treatment, but placed in context the rationales behind the action become more understandable.

Restitution: Steinway Piano History

In order to provide a contrast, another of Gould's Steinways is examined, this time one that was left in the state in which he knew it. This is an instrument of 1943, purchased by the T. Eaton Company of Toronto for their Concert and Artist Fleet. The piano has been described as "the one that Gould loved best"[30] and he himself said it is the instrument "to which I feel a greater devotion than to any other piano that I have encountered."[31] He played many concerts and made most of his recordings upon the instrument.

While in the possession of the T. Eaton Company, from 1951 onwards, the piano remained under a service contract with Steinway and Sons. Many concert players leased it from Eaton's, and it was during the latter part of this period that Gould became acquainted with it. He began to make adjustments to it in 1960, and his growing attachment to it eventually led to his purchase of it from Eaton's in 1970. He described it in the following way:

> This piano has a very light action, as indeed all pianos that I prefer do. Many people say it's tinny and sounds like a harpsichord or a fake harpsichord or God knows what. Maybe it does. I think it has the most translucent sound of any piano I ever played.[32]

It has been said that Gould was forever trying to recapture the feel of his Chickering, the first piano he owned, but it is clear that the specifications he was trying to recapture were never well defined in his own mind. Glenn Gould biographer Geoffrey Payzant says of this search:

> The Chickering may be Gould's dream of perfection, but it is the nightmare of every piano technician who has worked on a Steinway

[30] Otto Friedrich, *Glenn Gould: A Life and Variations* (Toronto: Lester and Orpen Denny, 1989), 10.

[31] Liner notes to *J. S. Bach: Two- and Three-Part Inventions . . .* , quoted in Payzant, 106.

[32] Jonathan Cott, *Conversations with Glenn Gould* (Boston and Toronto: Little, Brown, 1984), 47.

> for him, trying to adjust the action to what Gould at that moment remembers as the feel of the Chickering's.[33]

The Toronto piano tuner whom Gould employed for many years stated that "nothing precise could really be said about the desired specifications."[34] Payzant amplifies this:

> Glenn Gould does not tell us what he is seeking from his endless, agitated tinkering with his piano. Perhaps he does not know or, more likely, he does not want to look into the matter for fear of centipedal consequences.[35]

Gould was extremely particular about his instruments and, having become familiar with their idiosyncrasies, insisted upon using them wherever possible. This one was frequently transported to various recording and concert venues during its major period of use. During shipment in 1971 it was dropped and severely damaged. Repairs were carried out in Steinway's workshops and, although he used it for some years more, he eventually abandoned it. For his last recording—Bach's *Goldberg Variations*—Gould used a newly purchased Yamaha.

After Glenn Gould's death in 1982 his estate offered the piano for sale to the National Library of Canada in Ottawa with the stipulations that it remain in the state and condition in which Gould used it, and that regular concerts be given on it. The instrument's condition was monitored and repairs made when necessary. Regular tuning was contracted out to an Ottawa tuner, while Gould's tuner in Toronto was consulted as the need arose (fig. 3.2).

FIG. 3.2. *Glenn Gould's favorite Steinway piano, now displayed in the foyer of the National Library of Canada*
Photograph by the author and used by kind permission of the National Library of Canada

[33] Payzant, 105.

[34] V. Edquist, letter to National Library of Canada, 15 March 1983, National Library of Canada, file number 168-3-G9-6: Collections: G. Gould, piano maintenance, vol. 1.

[35] Payzant, 109.

The National Library's agreement to accede to the desire of the estate to keep the instrument in the state in which Gould used it, and to use it regularly for practice and public concert, placed a heavy burden on their curatorship. It was necessary to justify to players of the instrument, critics, and the concert-going public why the piano was maintained in this way. In 1993, during a concert by a visiting Hungarian pianist, a key failed to function and this caused questions to be raised by media critics. The following is a transcript from a radio interview between Suzanne King of the Canadian Broadcasting Corporation and Timothy Maloney of the National Library:

> Suzanne King: The Glenn Gould Steinway is looking a little dowdy; chipped paint and the like on the outside. And, given the incident last week, it could use a little work inside.

Timothy Maloney then provided an explanation of why the instrument was kept in exactly the state it was in when Gould was using it, and how this related to the vendor's stipulations.

> Suzanne King: So the Gould piano is really an artifact. But not entirely, because another part of the agreement stipulates Gould's piano must be used for performances. So the National Library does its best, having it tuned and checked before every performance. But, after all, the poor dear is aging (it's nearly fifty), and with age comes a few wrinkles.[36]

Repairs, adjustments, and tuning were the necessary support functions carried out on the piano after its acquisition. Based on the stipulations of the vendors of Glen Gould's estate, the National Library of Canada made a structured attempt at restoration, recapturing, and maintaining the state in which the piano was used. The attempt to preserve the unique qualities of the existing action and mechanism of the piano indicates the values of Restitution.

Analysis

How expressible and realizable, however, are the values of Restitution? What can be said definitively of that past historical state which the National Library was attempting to recapture and maintain? Gould himself could not, or would not, express what he wanted of an instrument; his "endless, agitated tinkering" indicates that any state in which he might find a piano would be a prime candidate for revision. Furthermore, after the accident and subsequent repairs at Steinway, Gould eventually set aside this favorite instrument,

[36] Transcript of *The Arts Report*, Canadian Broadcasting Corporation, reference number 18422-1, 3 May 1993.

and used his newly purchased Yamaha. Thus, the state in which he left the action of the Steinway could hardly be described as characteristic, even if it were possible to describe in purely metric terms what he really wanted. There is an indefinable subjective component, which causes the adjustments to become a matter of conjecture. As the tuner who later worked on the instrument at the National Library remarked, Gould was "far more interested in the creative act and its ability to reflect a dynamic and process-oriented conception of reality."[37] Although perhaps used as a pretext for failing to maintain the piano in its earlier state, this observation captures the essentially ineffable quality of what was being attempted, and the impossibility of definitiveness in any resultant mechanical set-up.

Thus, when the rationales for restoring and maintaining this piano as a monument to Glenn Gould's technique are analyzed, it becomes clear that the attempt to keep it in the state in which he used it is on treacherous philosophical ground. In the mechanical essentials, the quality which makes this instrument evocative of Glenn Gould is impossible to define. However, the outward appearance of the piano, with all the traces of his use upon it, has been preserved.

Opus Exhibition

History

In 1990 the Canadian Centre for Folk Culture Studies of the Canadian Museum of Civilization initiated individual purchases of representative recently made musical instruments produced by Canadian craftspeople. The object was to enhance the existing collection of folk instruments that had been accumulated over the previous seventeen years. It was intended by these recent acquisitions to better represent the work of current makers, and subsequently to exhibit as wide a range of instruments as possible in order to illustrate an active and continuing tradition of musical instrument making. Musical instrument makers throughout Canada were therefore commissioned to produce instruments typical of their normal output. Once acquisition had begun, plans were put in place for an exhibition entitled *Opus: The Making of Musical Instruments in Canada*. One hundred and two instruments, the work of fifty-five makers, were eventually represented in the permanent collection, and another seven makers lent instruments to the collection during the exhibition.[38]

The initial understanding among staff of the Museum was that the policy of not playing the existing instruments in the collection would be extended to the recent acquisitions. However, the preliminary policy document for the exhibition raised the possibility of concerts, broadcasts, and recordings. This proposed policy proved highly contentious in

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[37] Tim Várdy, letter to the editor, *Glenn Gould* 3, no. 2 (1997): 24.

[38] Carmelle Bégin, *Opus: The Making of Musical Instruments in Canada* (Hull: Canadian Museum of Civilization, 1992), 7-9.

view of museum acquisition and conservation policies. The conservation department of the museum was particularly concerned that use of the recently acquired objects would rapidly devalue their museum quality. Their views were as follows:

> There is no better use for the accessioned instruments than to be maintained for the present & future in the best condition possible, and one hopes that that is the state in which they arrive in the museum's possession. As such they will continue to represent the truth of what they are, examples of musical instruments made in our time and place, contemporary in every respect. With such an idea in mind, I recommend that they not be played. Use implies wear, wear implies required repair, repair implies alteration. Strings, reeds, mouthpieces, valves and pads, drum heads, in fact all the accessories and parts of musical instruments are subject to changes in style and materials due to changes in both fashion and technology. If the instruments are desirable now because of what they are now, then they should be kept as they are now. If they are played, they will not remain the same. For historical and musicological reasons an unchanged original instrument is usually the very most valuable example. That one will be the one that has been the least repaired.[39]

On the other hand, it was considered axiomatic by the curatorial staff that the sound quality of the instruments was their prime asset and, in consideration of the theme of the exhibition, music played upon them was seen as an integral part of their interpretation. Also, a policy of not playing in conjunction with the exhibition would have been extremely difficult to defend against the views and expectations of the museum-going public, and the makers and players of the instruments. Curatorial views were as follows:

> The instruments are the witnesses of instrument-making in our period and the historic instruments of tomorrow. We consider the documentation of these instruments, both of the processes of their manufacture and of their sound, to be of prime importance.[40]

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[39] James Hay, "Recommendations for the Maximization of the Use of Musical Instruments in the Collection of the CMC," internal memorandum, 29 August 1991, Conservation Department, Canadian Museum of Civilization, p. 1.

[40] "Les témoinages de la facture instrumentale de notre époque et les instruments historiques de demain. Nous considerons la documentation de ces instruments sur le plan de leur facture et de leur sonorité de première importance": in Carmelle Bégin and Constance Nebel, "Politique sur l'acces et l'utilisation des instruments de musique de la collection du musée canadien des civilisations," working document, 24 September 1991, Canadian Museum of Civilization, p. 2.

It was further pointed out that:

> The ultimate pursuit of any instrument-maker is the construction of an instrument that will produce a beautiful sound; the prime quality that any musician seeks in an instrument is that same beautiful sonority. When considering the theme of the exhibition, which is to render an account of the Canadian musical instrument-maker's work—of their production and the witness of this activity, the musical instruments themselves—it seems that the act of combining recording of the instruments with concerts on them, which will support the thrust of the exhibition, is justifiable.[41]

The views of the makers of the instruments are also of interest in this dialogue. Here is an observation from Grant Tomlinson, a Vancouver luthier:

> Over the past few days myself and a number of other lutenists in this area have been playing and assessing this instrument. We are of the common agreement that the sound of this instrument is quite exceptional. In my opinion it is the best lute of this type I have built to date. The top course of the lute is clear and singing in quality, and the sound becomes more rounded and "fatter" as you play in the middle and lower registers of the instrument. I feel that this would be an incredible instrument to have recorded by a good player. In some ways it is a pity that the lute will live its life in a glass case, as I think it would really develop if it was played well by a good player over a period of time.[42]

This lute had indeed been set up and played by the maker, although the "playing in" period had been arrested by the need to send the instrument to the purchaser. Thus, when the instruments collected for the *Opus* exhibition arrived at the Museum they were in a new condition but with varying degrees of use, depending upon the extent of adjustment and playing that their makers had performed before shipping.

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[41] "Le but ultime que tout luthier et facteur d'instruments poursuite est de construire un instrument produisant un beau son; le première qualité que tout musicien recherche dans un instrument est celle d'une belle sonorité. Considérant la thématique de l'exposition, qui est de rendre compte du travail des luthiers canadienes, de leur production et des témoins de cette activité de lutherie que sont les instruments de musique, il semble que le fait de combiner l'enregistrement des instruments avec des concerts, qui viennent etayer les propos de l'exposition, soit justifiable": in Carmelle Bégin and Constance Nebel, "Politique pour l'utilisation des instruments de musique," internal draft document, 1992, Canadian Centre for Folk Culture Studies, Canadian Museum of Civilization.

[42] Grant Tomlinson, letter to Carmelle Begin, 30 September 1991, records of the Canadian Centre for Folk Culture Studies, Canadian Museum of Civilization.

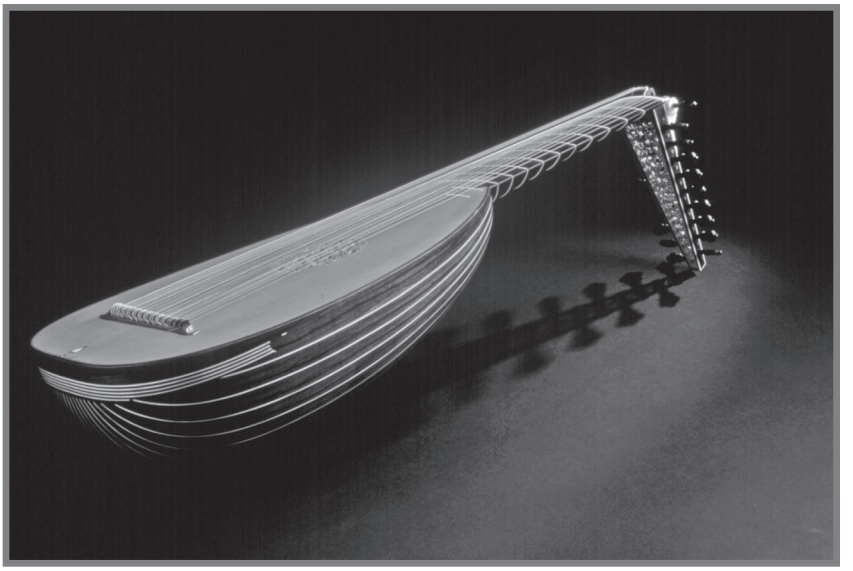

FIG. 3.3. *Baroque lute by Richard Berg of Ottawa (opus 57), played by Michel Cardin in a recording of* The London Manuscript *of Silvius Leopold Weiss (see n. 46).*
Photograph courtesy of the Canadian Museum of Civilization

In a newspaper article entitled "Rare instruments put to good use, saved from neglect," Richard Berg, maker of another lute for the exhibition (fig. 3.3) that was later featured in a commercial recording, regarded playing the instruments as:

> An excellent idea: "It really gives an opportunity for the instrument to be played." Unused instruments "lose life." "What good do they serve sitting in a basement somewhere or a storage area?"[43]

Regarding the "loss of life" of instruments in display cases, in the same article the director of the museum, had this to say:

> "The instrument will lose its soul, you won't be able to tune it any more," he says, noting that unlike other museum artifacts, instruments have to be touched to remain valuable. "Museums are intending to maintain objects in the best shape possible," he says. "For musical instruments, this is the way to do it." [44]

[43] "Lending program keeps music alive," *The Ottawa Citizen*, 7 August 1996, p. B6.

[44] Ibid.

Analysis

This case study demonstrates the conflicting views between exploiting the expressive qualities of the instrument and guarding its integrity. Arguments for playing the instruments are characteristically emotional, and evoke the subjective. Elements of the pathetic fallacy are encountered in the sentiment that an unused musical instrument "will lose its soul, you won't be able to tune it any more," and that "unlike other museum artifacts, instruments have to be touched to remain valuable." In two cases, preservation in a nonplaying state is looked upon as abandonment: the headline "Rare instruments put to good use, saved from neglect" clearly charges that the museum will be negligent if the instruments are not played; and "What good do they serve sitting in a basement somewhere or a storage area?" hints at their uselessness if not used. The word "basement" evokes disregard.[45] The lute "living its life in a glass case" is another evocation of sentiment, as are the feelings that surround its musical development. The belief that the instrument would develop if "played well by a good player over a period of time" is seriously held. These arguments for continued playing status have common elements of the intangible, the emotional, and the subjective. They are based upon feelings that are ultimately beyond metric description, but they have the effect of inducing dissatisfaction with silent status.

An argument for the preservation of integrity is represented by the conservation department's plea for continuation of a nonplaying state. However, this argument is weakened by an unclear understanding of the difference between the primary state and the first functioning state. In the case of any functioning object, there is a period of transition when the object is brought into a state that suits its first user. For musical instruments this is known as *playing in*. Thus, when the conservator states that "for historical and musicological reasons an unchanged original instrument is usually the very most valuable example," this subtlety is not appreciated. A musical instrument that has not yet been brought into a playing state is not yet a musical instrument; its list of aesthetic attributes entirely lacks those associated with the performance of music. Arguably, its value as an exemplar of musical practice is much diminished by the lack of evidence of its use.

The argument that none of the instruments should be brought into playing state is weakened by another factor; an unplayed state could not actually be assured in practice. Evidence provided by the maker of one of the lutes indicates that "playing in" had commenced, but had been arrested by the need to ship the instrument to the purchaser; the maker points out that the instrument had begun to develop, but could develop further. This instrument, at least, was not in an unused state when received, thus in fact confirming the conservator's assertion that "if they are played, they will not remain the same."

The grounds upon which the argument for maintaining nonplaying status is based, therefore, shows two inconsistencies: an unused musical instrument carries no information

[45] The instrument maker who made this statement had already visited the storage area on the second floor of the museum building.

upon musical practice at the time of its fabrication, and a commonly shared level of use throughout the items of the collection cannot be assured. For these reasons, the altruistic stance of guardianship towards the pristine state of the instruments loses much of its persuasiveness.

Exploitation of the instruments' musical characteristics was considered as important to their collection and exhibition as was the documentation of their fabrication. The position that the museum chose to follow was to allow some of the instruments to be recorded for the exhibition under controlled conditions, and then to institute a loan program for others. A decision to employ the makers of the instruments to provide regular servicing and maintenance (and more invasive repair if and when necessary), together with the stipulation that annual reports on the condition of the instruments must be submitted by the users, was seen by the curatorial staff as a way of accumulating documentation during normal use. It was argued that such information would provide greater depth and historical detail than would be the case in static storage. In addition, commercial recordings made upon the instruments while on loan added further substance to the instruments' dossiers (fig. 3.4). This "active conservation" of the instruments, in the systematic documentation of their condition and the recording of their performance, is an example of the values of Preservation brought to bear upon Currency.[46]

FIG. 3.4. *Harpsichord by Yves Beaupré (opus 48), played by Luc Beauséjour in a recording of Antoine Forqueray's* Harpsichord Suites 1,2, & 3 *(see n. 46).*
Photograph courtesy of the Canadian Museum of Civilization

[46] Among recordings produced during the loan program are: *Silvius Leopold Weiss: le Manuscrit de Londres*, Michel Cardin (baroque lute by Richard Berg, opus 57), SNE, 608-CD; *Joseph Bordin de Boismortier: Flûte et Clavecin Op. 91*, Claire Guimard (baroque flute by Jean-François Beaudin, opus 42) and Luc Beauséjour (harpsichord by Yves Beaupré, opus 48), Atma ATM-2-9730; and *Antoine Forqueray: Harpsichord Suites 1, 2 & 3*, Luc Beauséjour (harpsichord by Yves Beaupré, opus 48), Naxos 8.553407.

Discussion

There are two chief features that the process of analysis within this new framework exposes: the centuries-old conflict between the subjective and objective aspects of musical experience, and a clear demarcation between the operations of bringing an instrument back to a certain state, and of keeping it there. These two aspects, which we will label *authentic experience* and *intervention with tools*, are discussed below.

Authentic Experience

The use of genuine historic instruments (as opposed to copies) encourages the subjective aspects of musical experience. In trying to recapture some past ambience, we are attempting to bridge the profound distance between the context of the instrument as it now is, and the context of the instrument as it once was. In the opinion of philosopher Christopher Cherry, this familiar sense of being profoundly distanced from the past is often misrepresented as being epistemic in origin—as a cognitive deficit due to a lack of information. He argues, however, that "any possible epistemic relationship, no matter how intimate, fails to satisfy."[47] The sense of estrangement from the past persists, even in the presence of historical knowledge. Through this he identifies a difference between knowing the past, and wishing to retrieve it. He defines a sense of the "gulf separating the here-and-now and the over-and-done-with," and he labels the sensation resulting from its contemplation the "aesthetic."[48] This is the authentic experience that we are seeking in playing historic instruments. An example of this essential aesthetic component is provided by instrument conservator John Watson in a memorable quotation:

> Playing Beethoven on an early nineteenth-century piano, one cannot help imagining the day when the same instrument took part in the creative process of Beethoven's contemporaries if not the composer himself. This represents a profound opportunity to step into a dimension of the cultural landscape from which the music originated.[49]

This process of entering a "cultural landscape" is the attempt to elicit aesthetic experience of past phases in the use of a musical instrument by auditory and tactile means. And such an experience is necessarily very personal and highly subjective. It has nothing to do with the mechanical set-up of the instrument, the stringing, the tuning, or any other physical datum. The case of Glenn Gould's Steinway piano (the refurbished one described first

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[47] Christopher Cherry, "How can we seize the past?," *Philosophy*, 64 (1989): 67.

[48] Ibid.

[49] John Watson, "Historical Musical Instruments: A Claim to Use, An Obligation to Preserve," *Journal of the American Musical Instrument Society* 17 (1991): 74-75.

in this article) demonstrated this; the specific physical set-up of the instrument was entirely lost in the treatment, while the instrument remained "Glenn Gould's piano." In fact, entering a "cultural landscape" has all to do with the "gulf separating the here-and-now and the over-and-done-with." And the cardinal mistake we all commit when we go head-to-head with each other over *restoration versus conservation* is to assume some sort of equivalence between the aesthetic and the epistemic. They are utterly different kinds of thing—one based in feelings and the other based in information—and they cannot be compared with each other. There is no trade-off. For this reason, arguments over whether or not an historic instrument should be played are pointless, and ultimately insoluble. There will always be division and contention as long as people exhibit both intuition and reason. Although such an unequivocal statement appears to close off what has hitherto been a fruitful source for conference attendance and for the publishing of papers in the last three decades, the second aspect of analysis within this new framework shows that much still needs to be accomplished. The focus, simply, must change.

Intervention with Tools

There are two distinct, and conceptually quite different facets of craft intervention—maintenance and restoration. These have been customarily conflated, thus producing the present simplistic bipolar model. The tension discussed in the introduction surrounding the question of "to play or to preserve" arises from an interpretation *only* of actions, and not of their underlying rationales. When rationales are not explored and differentiated, the actions become regarded together, in opposition to preservation, and simply as "intervention with tools." However, when the significantly different rationales of maintenance and restoration are exposed to critical analysis in the three-regimen model a truer situation emerges. Two quite distinct sources of tension become apparent:

- The tension between *restoring* an historic instrument to a working state, or preserving it in a nonworking state.
- The tension between *continuing to maintain* an historic instrument already in a working state, or preserving it in a nonworking state.

Thus, the previously held view that there exists a single source of tension now loses much of its energy and focus. Through analysis of rationales, it is evident that there is now no longer a single tension between craft action and preservation. Instead, there are now two very different cases to be considered, and two very different conclusions to be drawn. The dialectic of "to play or to preserve" becomes:

- to restore or to preserve?
- to maintain or to preserve?

The first question can be answered succinctly; we know that restoration involves conjecture, we know that it involves irreversible modification of the instrument under treatment, and we know that the musical results of restoration contain no information of historical value. It can, therefore, be stated categorically that the information that a derelict instrument embodies provides a much more powerful justification for preservation than personal aesthetic experience gained through its treatment.

But what of historic instruments that are already in essentially working condition? We can begin to answer the second question by posing a new one: "Under what conditions and with what restrictions can playing be contemplated?" If the instrument is in sound condition and is already playable, how can its future use be structured so that its aesthetic presence can be respected? Clearly, what is needed is a decision-making protocol where as many factors as possible are weighed against each other on an *individual basis*. Each historic instrument must be allowed to dictate its own future, unencumbered by misinterpretations and rigid stances derived from unclear understanding of rationale, motive, and context. This is the task that needs to be accomplished. A new contextualism must emerge, and when it does it will be a fitting replacement for the endless and circular discussions that place conservation and restoration at opposite poles of an imaginary spectrum.[50]

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[50] Since the writing of this paper I have refined my approaches to the conservation and restoration of historic musical instruments. As a result, some of the ideas and concepts expressed here have been revised, and the case studies have been enhanced and augmented. One particular change in concept should be noted: in recent publications the terms "restitution" and "preservation" are replaced with the more familiar "restoration" and "conservation." Thus, the explanation for the use of the former two terms is valid in the context of this chapter only, and the terms should therefore not be applied more widely. I would like to draw readers' attention to the following publication where the philosophical basis for this work is expressed in greater detail: Robert Barclay, *The Preservation and Use of Historic Musical Instruments* (London and Sterlin, VA: Earthscan, 2004).

4

Parallel to the Organ: The English Virginal in Stuart England

Darryl Martin

All the seventeenth-century English keyboard instruments are closely related. At least four makers of extant English virginals—James White, Thomas Body, John Loosemore, and Charles Rewallin—are known to have also worked on organs.[1] This close relationship between the organ and the virginal suggests that the same design aesthetic, as well as many of the same construction processes, were used on both types of instrument.

This chapter will consider how the English virginal, particularly the currently restored examples, can perhaps provide useful information and lessons when considering the restoration of seventeenth-century English organs, with special reference to the Historic St. Luke's (HSL) instrument. It is a personal view, written as a maker, restorer/conservator, and researcher of stringed-keyboard instruments, concentrating on the English virginal. I am *not* a player of any note, and I hope that does not unfairly bias any of my opinions and conclusions. I believe I am the only person to have examined all the surviving English virginals, and the only person who has heard and played all the currently restored examples. I am also one of only four people (at the time of writing) still living who has restored an English virginal to playing condition.[2] I have therefore faced the question of the implications of gains and losses involved in the restoration of an instrument applicable to the subject matter of this book.

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[1] James White was a partner of the organ builder Ralph Dallam, and completed several instruments after Dallam's death. Thomas Body's apprenticeship was with Joseph Boddy (probably a relation), the organ maker who submitted a bill for £100 "For the quire Organ," with a further £8 "for setting up the Organ in the Quire." See Joan Jeffrey, "The 17th and 18th Century Quire Organ in Canterbury Cathedral: Some New Observations," *Organ Yearbook* (1997): 1-23 for full details. In addition to the organ case which remains at Exeter Cathedral, Loosemore made an organ for Nettlecombe Court which still survives. The inventory taken at the death of Charles Rewallin in 1697 includes the following:

> in the high back chamber on Argon [organ] & on spinet and on littel cabinet . . . . 17£ 5s 0d
> fower score Argon pipes and Lumber in the house . . . . . 2£ 0s 0d
> for an organ at the Globe [Inn] . . . . . 15£ 0s 0d

See Derek Portman, *Exeter Houses 1400–1700* (Exeter: University of Exeter, 1966) for the full inventory.

[2] The others are Derek Adlam, who led the Finchcocks team which restored the 1642 Thomas White virginal in the Victoria and Albert Museum; Andrew Garrett, who restored the Robert Hatley and Philip Jones virginals

There are twenty-two surviving English virginals. The earliest dated instrument is 1638,[3] although two unsigned instruments are almost certainly earlier, probably from 1580-1600.[4] The last dated example is 1684.[5] These extant virginals, being from the same period, region, and even sometimes the same workshops, thus serve to inform the restoration of organs such as the Historic St. Luke's chamber organ.

English virginals are rectangular in shape, originally all with coffered lids, and usually built of oak. The exteriors are plain, decorated only by iron strap hinges and lock-plates. The interiors of the lid and fallboard, like the inside of the HSL organ's doors, are decorated with polychrome naïve scenes. The key-well and face-boards are decorated with wood moldings and gilt embossed papers. The keyboards of all the surviving instruments dating from before 1660 have boxwood natural touch-plates, hardwood accidental plates, and gilt embossed paper arcades, as found on the HSL organ. After 1660 other key-covering materials were occasionally also used.[6]

This consistency of materials and decoration is also to be seen in the design layout of the virginals. All the instruments have keyboards which are placed to the left of center, resulting in similar plucking-point ratios, and they were all designed for the same treble stringing material. The surviving examples appear to be designed to play at different pitches, echoing the organs of the period, and all the instruments share a similar, proportional relationship of the bass and treble string lengths.[7]

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in collaboration with Richard Clayson; and Christopher Nobbs, who restored the 1662 Thomas Body virginal and carried out the work on the soundboard of the John Player instrument.

[3] Made by Thomas White. This instrument is the orphan of a mother-and-child double virginal combination. It is privately owned.

[4] I refer to the instruments as "Mar" and "AH." The Mar instrument belonged to Lady Marie Stuart, Countess of Mar, who was the second daughter of James VI and I's favorite cousin Esmé, Duke of Lennox. The instrument must have been built between 1579, the date of their return from France to Scotland, and her death in 1644. The AH virginal shares similarities suggesting a similar date to the Mar instrument. My dating is based on various stylistic grounds, see Darryl Martin, "Two Elizabethan Virginals?," *The Galpin Society Journal* 53 (2000): 156-67.

[5] Made by Thomas Bolton, and now housed at Warrington Museum, Cheshire, England. The instrument is signed and dated on the lowest jack. Until recently it was erroneously thought to be by Charles Haward.

[6] The earliest instrument to use natural key coverings of a material other than boxwood is the 1664 Robert Hatley virginal at Fenton House, London. The present keyboard (with ebony naturals) is not original, but a photograph taken before the last war shows it previously had a keyboard with dark naturals, probably snakewood. The present bone accidental touch-plates were probably taken from the original keyboard. The instruments by Keene (1668 and 1675) and Jones (1671) have snakewood naturals, and the 1684 Bolton virginal has ebony naturals. All other instruments have boxwood natural touch-plates.

[7] See my "English Virginal Design Concepts and Pitch Standards," paper given at the Galpin Society Symposium, Edinburgh, August 1997, for full details including pitch comparisons with contemporary organs. This work has been updated and is included in my Ph.D. dissertation, "The English Virginal" (University of Edinburgh, 2003), vol. 1, ch. 2.

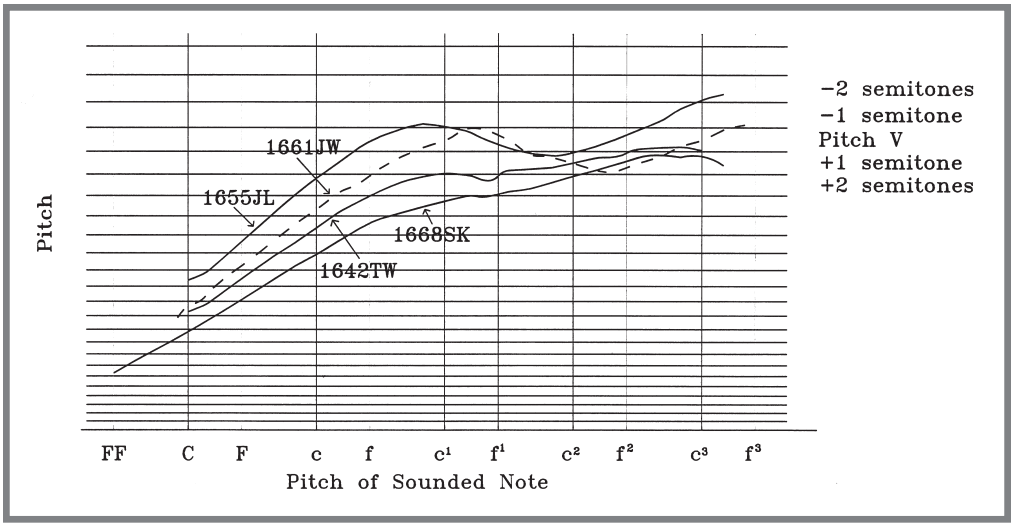

FIG. 4.1. *The graph illustrates various approaches to scaling found in English virginals. The horizontal lines indicate Pythagorean scales, and are graduated in semitone intervals. Four instruments are shown. The 1642 Thomas White shows little foreshortening over the top two octaves, while the 1668 Stephen Keene has a constant foreshortening over most of the compass. The 1655 John Loosemore foreshortens by about 2½ semitones over the top 1½ octaves, and then increases to within a semitone of its treble scaling below middle c, and the 1661 James White (drawn as a dashed line to increase clarity) foreshortens by two semitones in the top octave, and then increases (almost to its treble scaling) at around* d^1.

A study of the above-mentioned features suggests that the surviving virginals are at least generally representative of their tradition. Not surprisingly, however, there was no "standard model" which acted as a template for all makers or even, for that matter, all the work by an individual maker. Three of the instruments—those built by Stephen Keene and Philip Jones—have divided wrest planks, the bass tuning pins placed into a substantial block of wood which effectively deadens the left-hand back corner of the instrument. The soundboard barring also follows different layouts, although three or four basic designs can be determined.

The scaling of the strings through the compass also varies.[8] Some instruments have scales which are essentially Pythagorean, other virginals show a fairly consistent foreshortening throughout the compass, and a number of instruments have scales which reduce by two or three semitones within the top octave or so, and then increase again by the middle of the compass before foreshortening in the bass. Different scaling approaches can occasionally be found in the work of the same maker or workshop tradition, showing that some active experimentation was taking place (see fig. 4.1).

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[8] The term "scaling," when applied to a stringed-keyboard instrument can have two definitions. The first definition refers to the string length of a particular note, usually c^2 (the c above middle c). In an English virginal it is usually c^3, which acted as the design-scale note. This string length acts as a guide when determining the likely pitch of an instrument. The second definition relates to the other string lengths when compared to the design-scale note. An instrument which is described as being "Pythagorean scaled" has strings which are proportionately lengthened for their given pitch, so that c^2 is twice as long as c^3, and so on. Thus, an instrument with a 6 inch c^3 string length might have a g^2 string length of 9 inches (ratio of 3:2), and a c^2 string length of 12 inches and so on. This instrument would be Pythagorean scaled. If the instrument had a g^2 string length

Eight of the instruments are currently in playable condition.[9] This sample is just over one-third of the total number of extant English virginals, a fairly high proportion compared with seventeenth-century instruments from other schools. Most variants in design mentioned above can be found in the restored examples, and therefore these virginals can be considered a fairly representative sample. I will add the caveat that several of the restored instruments have the wrong treble stringing material, and thus play at an incorrect pitch, having tonal implications.

* * * *

Early instruments should be considered as primary documents that have been preserved in the same way as music manuscripts or composers' notebooks. Ideally we would wish that all the surviving examples be in their original condition, still playable, and retaining all their ephemera—for example, the original cloths and leathers, even the original quills that plucked the virginal strings. Equally, one would like the instrument to be in the same structural condition as new—in short, we would like the instruments to be in "as new" condition, apart from the unavoidable effect of aging. In fact, preferably we should have duplicates, one that could be played, and another to be conserved.

Unfortunately, no early keyboard instrument can be described as being in our wished "as new" condition. There is normally some structural movement, however minimal, due to imperfect storage over the years. More notably, the number of plucked keyboard instruments which have escaped any form of restoration or repair following their historical period of use has been estimated at no more than about thirty, out of a *surviving* corpus of perhaps 2000 or so instruments.[10]

No English virginal has survived unaltered. Only one instrument still has any evidence of old, probably original, strings.[11] There is also only one instrument—not the same example—which retains all its original action cloths.[12]

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of 8½ inches and a c^2 string length of 11 inches (giving c^3 equivalent scales of $5\frac{2}{3}$ and 5½ inches respectively) the scale, using the second definition, would be described as foreshortened.

[9] By "playable condition" I mean instruments on which performances could be given. Many more of the instruments have been restored previously but have fallen into disrepair, although it is still possible to hear isolated notes.

[10] I am unaware of any systematic study to determine the true number of instruments still in essentially original condition. It would include instruments which are too badly damaged to be considered restorable, those which have been in the ownership of people who are not interested in the musical aspect, and instruments which are often not considered as being "worthy" of restoration, often octave-pitch instruments in museum storerooms.

[11] The 1671 Philip Jones virginal at Tabley House, near Manchester, England. The instrument is restored, but the original tuning pins, with broken coils around them have been preserved separately.

[12] Built by Charles Rewallin of Exeter in 1675. This instrument is now in the Castle Museum, Taunton, England.

I believe it is important to reflect on how the surviving instruments can be used as documents that will give *every* interested person a better understanding of their capabilities.

Various types of interested people have different priorities when viewing original instruments. As a researcher, my main concern is to identify as much as I can about the design concepts and working methods of the original maker. There are a number of questions that I try to answer. What was the original intention of the maker in regard to pitch, compass, and plucking ratios? What parts of the work were predetermined by the use of templates and jigs and what is the result of building the later parts to fit the existing ones? Are there any elements of the design which form notable departures from other instruments by the same maker, or makers of the same school?

Other details I am specifically concerned with are of particular interest to modern builders as well. How did the original maker actually work on the instrument? In what order did he do the work? How accurately did he work on the various parts? What tools did he use, and why? How much of the work was essentially production line to be repeated from instrument to instrument, and what was customized?

The final parts of building an instrument involve and interest performers as well. How did the instrument sound? Much of that has been determined by the time the instrument gets to the finishing room by the design and execution of the work, but the final result can still vary greatly. How loud is the instrument? What is the balance like from bass to treble, and from register to register? What is the depth of touch, and how much resistance do the player's fingers meet? How was the instrument tuned?

There are other matters that an instrument may be able to provide evidence about which have no special interest to the modern organologist or builder, but should be of major importance to a performer. What can be learnt about hand position and technique? Or about fingering? Can anything be discovered about the player's repertoire? What information remains about the registration used by the early players?

As a maker, my goal is to use my research to inform the making of an instrument with the design concepts and working methods of a particular maker or instrument-making school. Such an instrument would not be a replica of an original, any more than two instruments of the same design by the same maker would be dimensionally identical. It need not even be designed for the same pitch or particular compass. The resulting instrument would be, I hope, a reproduction or reconstruction in the most exact sense of the words—an instrument built identically to the original in concept and practice.

A restorer approaches the original instrument from a different perspective. He is entrusted with making an instrument play and sound as well as it is able to. The ultimate beneficiaries of this work are mostly performers, though, of course, researchers and makers can find useful information from a restoration in progress.

The restoration of an instrument may be regarded as consisting of two different elements. The first part is structural, the second is musical.

The structural restoration is often related to conservation, certainly in the practical museum approach, in the sense that some of the processes would be carried out just to preserve the instrument from further deterioration, or to make it acceptable for display.[13] This can include tasks such as ensuring the case construction is solid, the shimming of soundboard cracks, and so on. On some occasions replacement parts may be required where the originals are missing. Even if a playing restoration is not being considered, a museum conservator might replace clearly modern and anachronistic additions with newly fabricated parts closer in design to the original.

It is during this first stage that many of the details that interest the researcher and maker can be discovered. The following are a couple of examples from my own experience.

In the winter of 1991-92 I restored an English virginal by John Player, dated 1664, to playing condition. I felt no problem ethically with what I was doing, the instrument had been restored on at least three previous occasions, and much of what I was faced with was early twentieth century in origin. The instrument belongs to a private collector, the majority of whose instruments are regularly played, and is housed in a National Trust property open to the public.

One of the tasks was to replace the register leather dating from the mid-1950s with one that was closer in design to the original. English virginals usually have small pin-pricks on the register leather between the widely spaced jack slots. These marks were clearly used as part of the marking out process, acting as a guide for the strings to pass centrally between the jack slots and ensuring that the plectra are the same length. The pricks were missing on the modern leather, but when it was removed, the marks were very visible in the soundboard wood, showing that pins of some description were firmly nailed through the original leather and into the soundboard, thus providing evidence that all the soundboard marking-out and pinning was done prior to the installation of the soundboard.[14] This counts as information learned as a result of the restoration.

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[13] The terms "conservation" and "restoration" are used indistinctly by most people. Strictly, I would define *conservation* as work carried out to stop any active decay, or in a passive sense, to reduce or stop the risk of future decay. *Restoration* can be defined as work carried out which alters the fabric of the object. Museum conservators do considerable restoration as part of their normal working practice, despite their title. *Restoration* need not involve returning an object to a state that would enable it to serve its intended usage, for example, a restored ceramic water jug need not be watertight, and a musical instrument does not have to be playable to have been restored. Hence the structural work on an instrument is usually definable as restoration, even though it may be carried out for display purposes or as part of a playing restoration.

[14] The pins are used only as a guide and are later removed. Therefore their size is essentially irrelevant (within reason). It would be equally acceptable to use thin pins lightly tapped in to the leather as the heavier pins which were firmly nailed. The thin pins would suggest the work was done with the soundboard glued in, since only a little pressure was applied. The firmness of the nailing as found could only be done with the soundboard resting on a solid surface, or else the thin board would have broken in places under the pressure from the hammer.

On the other hand; it was essential to re-glue the left-hand bridge to the soundboard, because it was separating and would clearly not withstand any string tension. I thought it likely that there would be some marks underneath the bridge, giving details of the original marking-out process used to ensure the bridge was correctly located. There were no marks underneath the bridge at all. My expectation was wrong, and I learned nothing about how the bridge was properly located from the restoration of this instrument.

Musically, the instrument was a great success. The tone was—if I can be at all objective about it—very good. I have mentioned that I believe the eight restored virginals are representative of the surviving examples, and although the final tone is to an extent in the hands of the restorer who sets up the instrument, I shall try to make some generalizations on the basis of all the playable instruments.

Since the essential purpose of a playing restoration is to hear music, I would like to question what has been learned from the work done on the Player instrument. It is one of the most recent English virginals to have been returned to playable condition, and I had already heard the other functioning instruments before I restored it.

I must say that I believe there is no increase in our knowledge as a result of hearing it played. Sound is hard to describe verbally, but all the English virginals have a similarity to them. They produce a powerful sound, one that carries very well, and it is very transparent, in that it does not overpower the music. The tone is a little hollow, certain harmonics always seem to be weak, but it is never dry.

Generally, the sound is attractive, both solo and with other instruments. Not all instruments are equally excellent, though. The virginals by Stephen Keene and Philip Jones are a little different, the Jones being quite disappointing, though I stress the opinion is subjective. As mentioned above, both these instruments have two wrest planks, with the bass tuning pins attached to a large block across the left hand back corner. This block has the effect of totally deadening the soundboard in this region, unlike the other virginals that have the left-hand bridge on vibrating wood. The right hand bridges have different soundboard barring underneath them, but I am unable to say how this affects the tone.[15]

The soundboard barring arrangement of the other instruments also varies, but it is not possible to determine what effect it has on the result. The design and scaling layout must also have an effect, but again I cannot define it properly. The instrument which has the best scaling design, judging by most common modern opinions on the subject, has a sound which is best described as "nutty," a term I would not use about the other virginals.[16]

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[15] The 1671 Jones instrument has three bars at right angles to the long section of the bridge, whereas the Keene has no original bars under the bridge. Although there is a general tendency to use more bars under the soundboard in later instruments, suggesting the soundboard needed to be controlled more, it may be that the use of only a single active bridge requires less stiffness than an instrument with two active bridges. This would be difficult to test, and the tone we hear from these restored instruments could have other over-riding factors not considered.

[16] 1662 Thomas Body, in private ownership. The term "nutty" is not meant in any way as a derogatory remark. It is individual, but not at all unattractive.

After restoring the Player virginal I did not hear it for about six months, and during the interim it was in the care of the collector's regular technician. On hearing the instrument again, and then doing some subsequent voicing work on it, I became aware of how much of an effect an instrument's finisher has on the tonal result. All the currently restored English virginals have been set up by different people, and I believe from my experience with the Player instrument that the restorer can make as big a difference to the sound as the design itself.

With the benefit of hindsight, I do not regret my decision to restore that instrument; the amount of previous work on it made it an ideal candidate for restoration. Musically, however, I do not believe there was any gain in making it playable again. Nor do I believe that there will be anything to learn musically from the *restoration* of any other currently unplayable English virginal.[17]

As researchers discover more about the design principles and working methods used by the original makers, it is becoming clearer that there are no arcane secrets awaiting discovery. Nor did old makers use wood that is necessarily better than that still available today, in fact, often the wood quality is poor.

It is regularly remarked that modern instruments do not sound the same as the originals (or each other, for that matter). I believe this is due to the modern maker and restorer often being different people. The copies of English virginals I have heard all have the essentials of the tone that I have mentioned. I have made instruments—both plucked instruments and clavichords—based on playable originals that I have worked on or to which I have had good access. Musically I have found that my copies always share the characteristics of the originals, and several blind tests have shown them to be indistinguishable note-for-note.[18] I therefore believe that it is a fallacy to suggest that old instruments are the only way of hearing the true sound of an instrument.

I would like to relate my work to the Historic St. Luke's organ. This instrument may contain some information, relevant to my own studies of virginals, that is surviving in no other instrument. Being the most ephemeral of details, the original voicing of all surviving virginals is of great interest but now altered. Even if a virginal could have survived untouched by human intervention, the voicing will have been altered by the passage of time. Moreover, we do not currently have the technology to analyze historic quills for their evidence of voicing, even if they could have survived. Barbara Owen, in her article on

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[17] By this I mean that there will be nothing that can be quantitatively determined. Another newly restored instrument might sound extremely good, be very disappointing, or simply different. But from my examinations of all the instruments I would not be able to point to any design or construction element that could be specifically said to determine the resulting sound.

[18] I have carried out tests using my reproductions alongside original clavichords by Hubert and an anonymous triple-fretted instrument (both in the Russell Collection), and with a harpsichord by Gregori (Barnes Collection). Dr. Grant O'Brien has carried out similar tests with his reproduction of a Ruckers harpsichord and an original in the Russell Collection (private communication).

this organ published in *The Tracker*,[19] implies the HSL instrument has had only a single restoration, probably in the early nineteenth century. It is possible, therefore, that the voicing—in the sense of volume balance over the compass and registers—might be unaltered. This information—*fundamental* to a performer—is otherwise entirely speculative as far as seventeenth-century English domestic-keyboard instruments are concerned.[20]

Some musical characteristics of the HSL organ that presently survive would almost certainly be lost, no matter how carefully the instrument was restored, or how complete the documentation. Put another way, performers have much to lose by getting the chance to hear it played. The decision to restore an instrument can never be made with full assurance of the end result or the pitfalls that may be encountered. This is even more apparent when major work is required. Once restoration is commenced, a series of other decisions must be made which often cannot be predicted in any preliminary study of the instrument. This may involve interfering with the fabric of the original in a far more intrusive manner than desired, no matter how conscientious and knowledgeable the restorer.

The generally accepted view is that instruments to be restored should be returned to the state of their last historical use. In the case of the HSL organ, is it the mid-nineteenth century? If so, is this the instrument on which to play music from that period? Or if restored to its seventeenth-century state, would it be acceptable to use the original stop control method and hand-operated bellows on the top of the organ? I presume the more regular wind from an electric blower would produce a different result, however subtle. The pipes having been cut down, can the result even be said to legitimately resemble the original, since the scaling has effectively been altered? More importantly, I expect that the organ would need considerable work to ensure an even volume-balance and touch. The "original and untouched pipework," to quote Barbara Owen's article, may well need to be modified in order to return the instrument to acceptable playing condition. This will mean that much information of interest to future researchers and *players* will be lost. This is the information I would like to know now. This work is always irreversible, and no matter how carefully we try, it is impossible to accurately and fully document.

* * * *

In 1995 the Museums and Galleries Commission published *Standards in the Museum Care of Musical Instruments*.[21] To compile the book, this British Government-funded body formed an "expert group." Over twenty invited consultants represented different views of instrument care. Among other musical instrument specialists, including myself, the

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[19] Barbara Owen, "A 'Payer of Organs' and a 'Voyall'," *The Tracker* 41, no. 2 (1997): 4-11.

[20] I am unaware of any other English organ of the period which retains enough unaltered or little-altered pipework to enable any firm conclusions to be made.

[21] Crispin Paine, ed., *Standards in the Museum Care of Musical Instruments* (London: Museums and Galleries Commission, 1995).

Commission included various members of its own staff and some from their Conservation Unit. The "expert group" was designed to be as balanced in perspective as possible. The book was intended especially for the use of museums or buildings with a small collection of instruments, usually with no musical instrument specialist on the staff. I believe this is the first time that an attempt has been made to publish such a series of unbiased guidelines.

The question of restoration ethics was discussed and published as Section 4. Despite the wide range of consultants, there was notably very little disagreement over the formulation of these guidelines. Section 4.7 states ". . . there should always be a presumption against the playing of musical instruments from museum collections . . . ," and then goes on to consider what instruments could be suitable for restoration and playing. There was unanimous agreement in the discussion of the consultant group that instruments which have had the *least* alteration and modification—i.e., those which have the most primary information—are the ones which should be preserved in an un-restored and unplayable condition.

One major reason why these instruments should be conserved rather than restored is the wealth of information concerning the musical characteristics that might exist—potential answers to questions concerning touch, hand position, technique, and registration. This field of research is currently almost entirely ignored. The information is lost, not only through the restoration of the instrument itself, but also through playing it after restoration. Again, this is irreversible. The main beneficiaries of this information—the performers—have other research areas which are more immediately rewarding, as have organologists. Also, the technology to make such research practicable is still in its infancy. I am aware of only one preliminary study on keyboard wear which has been published to date.[22] It is important that we conserve instruments which may act as primary sources for future areas of research.

I would like to conclude by considering an English virginal by Stephen Keene, dated 1675.[23] This instrument has a history similar to that of the HSL organ. It is believed to have remained in the original family's ownership. Like the HSL instrument, it appears to have been worked on only once, albeit rather heavily, in the nineteenth century. I believe the intention was to restore it to playing condition—the effort aborted before completion. My first examination of the virginal in 1990 strongly suggested it had not been touched since that early work, an opinion based on the dust, and the discovery of late eighteenth-century gaming tokens inside. The owners do not wish any further restoration work to be undertaken on this virginal.

I have never previously considered this instrument to be particularly distinguished in any way. However, while writing this chapter, it has become apparent to me that this virginal shares both a similar background and a vulnerability with the HSL organ. It is *also* an ideal example of an instrument which could provide answers to many questions that will be asked by future researchers.

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[22] R. K. Lee, "Observations on the wear of two keyboards separated by 200 years," *FoMRHI Quarterly* 55 (April 1989): 37-40.

[23] Private ownership, Cheshire, England.

Part 2

Conservation and Organs

5

A Conservator's Contribution to the Restoration Team

David Blanchfield

A conservator working today relies on a strong background in scientific studies, all of which can be lumped together under the rubric of "materials science." Materials science can be defined as the study of the nature of various materials: natural organic substances such as wood, leather, and ivory; metals and alloys; and man-made substances such as plastics. In studying these materials, emphasis is placed on understanding the chemistry of the deterioration processes that each undergoes and the effects that various environmental conditions have on these processes. An understanding of the chemical factors at work allows the use of those same factors to slow, stop, or prevent deterioration.

Materials science informs all the three basic activities of conservation: analysis, intervention, and prevention. In this chapter, I will discuss several analytical and interventive techniques that are commonly used in the conservation laboratory. I hope it is clear that bringing this knowledge of materials science to the bench does not replace but augments the knowledge gained by practical fabrication experience.

Analytical procedures help us better understand the makeup of the object and the forms of deterioration that are at work. Inspection under specialized light provides a simple nonintrusive analytical method. Ultraviolet illumination, provided by inexpensive handheld long-wave ultraviolet lights, often allows us to observe differences in surface coating materials. Figure 5.1 is a detail of four wooden facade pipes from a mid-eighteenth-century organ in Colonial Williamsburg's collection.[1] This photograph was taken in normal white illumination. Figure 5.2 is the same view taken while illuminated by a handheld ultraviolet light. The two innermost pipes show a strong overall fluorescence. This fluorescence, which is actually yellow but shows up white in the photograph, indicates that the toe sections of these two pipes have probably been coated with a cadmium yellow glaze. When cadmium pigment is used in a binder to make paint, it is strongly fluorescent. Because we know cadmium yellow has been commercially available only since about 1850, this is identifiable as a non-original coating.

[1] The organ is number 1954-432 in the collection of The Colonial Williamsburg Foundation, and was originally made for Kimberley Hall in Norfolk, England. It is exhibited in the Chapel of the Wren Building, College of William and Mary in Williamsburg, Virginia.

FIG. 5.1. *A detail of the dummy facade pipes photographed under normal light, Wren Chapel organ.*

FIG. 5.2. *The same detail photographed under ultraviolet light. Evidence of two different coating histories can be clearly seen.*

Notice in fig. 5.2 that the topmost layer of paint on the two outside pipes does not fluoresce but does appear blotchy, indicating that some of the material beneath shows through. Notice also all the white areas. This white material is fluorescing very strongly and it is located in the areas where the surface coating is scratched, chipped, or otherwise disturbed. We can analyze this area more closely using a microscopic application of ultraviolet illumination. This kind of examination, called cross-sectional analysis, is the investigation of a minute sample from a surface finish to determine the coating history of an object. When viewed in cross section under magnification, it is possible not only to see multiple layers of finish, but also through microchemical testing and ultraviolet illumination, to determine the nature of the various materials used in coating layers. With this knowledge, it is possible to custom design a cleaner or remover that will affect one coating but not others. Thus it is possible to reveal an early or even original finish by selectively removing subsequent layers.

Figure 5.3 is a microscopic cross section illustrating a complex coating history. Closest to the wood, at the bottom of the micrograph, there are fine layers of gesso and bole with a layer of gold leaf. This indicates a water gilding process. After some time, as represented by a layer of dirt on the gold leaf, a second layer of bole was applied, and another layer of

gold. After this layer had broken down, a third, patching layer of bole and gold was applied. This cross section allows us to follow the current surface coating on the pipes right down to the original coating. It illustrates that the original finish on the pipes was gold and that this finish has been patched and repaired over time to maintain this appearance.

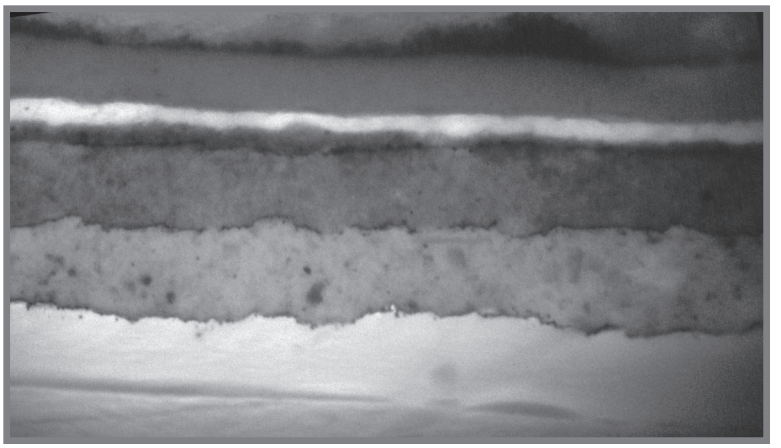

FIG. 5.3. *A cross section of coatings from the foot of a wooden facade pipe, magnified two hundred times and seen under ultraviolet illumination.*

A second specialized type of inspection uses infrared illumination. This technique is extremely useful when trying to read sometimes-invisible carbon-based inscriptions (such as pencil marks and some inks) on oxidized or dirty wood surfaces. The setup requires strong white-light illumination of the object, a video camera designed to read the infrared spectrum, and a monitor to view the results.

We examined the two lowest bass keys from the keyboard of a 1785 Samuel Green organ.[2] Under white light, the bottoms of the keys showed no visible inscription, but when viewed in the infrared spectrum it was possible to make out a section of the inscription, "GR . . . ," possibly the maker's name. Similarly, on a section of the bungboard from the same organ there was an unclear inscription that under infrared illumination, clearly revealed "No 49."

These analytical procedures thus help us to understand the object and its specific materials. Using interventive procedures, we can act to stabilize unstable materials present in an artifact, thereby slowing the process of deterioration. Although some conservation treatment stops at stabilization, intervention in the conservation laboratory often goes on to restore essential aesthetic qualities as well in order to help us more clearly "read" the object.

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[2] The organ is owned by Bruton Parish Church in Williamsburg, Va. The church presently incorporates the Green case in a modern organ and stores the 1785 chest, pipework, and keyboard.

A principal form of treatment is the reconstruction of lost or damaged elements. While every restoration workshop does this too, the approach used in the conservation lab draws upon a growing repertoire of minimally intrusive methods, again informed by a chemical understanding of the object's historical materials. By judiciously choosing materials from the vast array of materials now available, we seek to make fills and repairs that look and perform correctly, do not require removal of existing material, and can be easily removed themselves so as not to hinder future research. Whatever might be said of some past failures of modern materials, using the most traditional material is *occasionally* not in the best interest of preservation.

I will describe two examples that I have borrowed from a colleague, Mark Kutney, who works in Colonial Williamsburg's furniture laboratory.

The front legs of a japanned early eighteenth-century tall case clock had suffered a great deal of insect damage, and someone had once tried to minimize the damage by cutting the legs back to reach solid wood. This improved the support but left the clock tilting forward, and no longer faithful to the original maker's intentions. An additive repair was clearly in order. Epoxy, used with isolating layers to permit future removal, is a versatile material commonly used to make such repairs. Araldite AV 1253 is a paste epoxy with a number of characteristics that make it desirable as a fill material. It is strong, easily carved and sanded after curing, and can be pigmented or painted to match surrounding wood.

It would be difficult to remove an epoxy fill directly applied to the clock's bug-eaten wooden surface without more loss of original material. In order to make the repair removable, Mark Kutney first applied a barrier coat of hide glue to the broken surface to seal the wood and prevent the epoxy from penetrating the wood. This step alone is usually sufficient when surfaces are not too irregular, but here a small amount of cotton was applied over the rough surface to reduce and even out the gluing area. A strip of plastic was then taped to form a cylindrical mold, and the epoxy was poured. Following curing, the mold was removed and the repair was shaped and colored.

Kutney developed a refinement of this technique for an eighteenth-century chest, also in Colonial Williamsburg's collection. In this case, both back legs were very badly damaged by insects so that neither could bear the weight of the chest. The goal was to provide a barrier that would fill the extremely uneven damaged surfaces of the legs, be removable, and provide a surface for adhesion of the epoxy fill. In this case, he made a moist slurry of laboratory-grade filter paper and water in a blender and applied it directly to the surface, which had already been isolated with hide glue. The paper slurry was contained within a plastic dam. Allowed to stand overnight, the paper dried down to a tightly packed cap that could be removed and replaced as a unit. This papier-mâché–like barrier was not adhered to the wood, but held in place by chemical interactions between the cellulose components of the wood and paper. Kutney then made a mold and poured the epoxy over the paper. Figure 5.4 shows the fill, or more properly the extension, after the pouring

FIG. 5.4. *Compensation for loss in this chest foot involved a removable epoxy fill that required no removal of remaining insect-damaged wood.*

FIG. 5.5. *The chest foot, again bearing weight after treatment.*

and shaping of the epoxy. Now when the chest sits upright, the epoxy bears the weight with no compression of the paper (fig. 5.5). The fills can still be removed with minimal disturbance to the damaged wood of the legs.

Another treatment technique involves the application of materials science to bench work by using controlled physical deformation to flatten or shape thin, unfinished wooden elements. Work on an eighteenth-century lyre guitar made by Mareschal of Paris demonstrates the procedure. The guitar had been stored in an uncontrolled climate for many years and as a result of widely fluctuating temperature and relative humidity, the condition was very poor and extremely unstable. Nearly all the glue joints had failed and the bent or arched elements had severely distorted. The back plate, made of Brazilian rosewood about 3/32" thick, was especially deformed. It had split and segmentally curled in the opposite direction of the original arching. The process I used to re-conform the back to the original arch made use of the phenomenon of hysteresis, in which a hygroscopic material such as wood, after being swollen by water, does not return fully to its original shape. The material nearly returns to its original shape, but it retains at least some new distortion. Relying on the cumulative effect of hysteresis, I repeatedly applied gentle humidification to the outside of the guitar back plate, each time allowing it to dry until the plate conformed to the original arch.

I humidified the back by removing it from the guitar and placing a damp blotter on it with a sheet of Gore-Tex between. Gore-Tex, the material used in sports clothing, allows water vapor to pass through but not liquid water. In this way, the material under the Gore-Tex is humidified but not saturated.[3] I wrapped the wood and Gore-Tex blotter package

[3] Gore-Tex is a registered trademark of WL Gore & Associates, Inc.

loosely in polyethylene, placed it under pressure in a curved form that approximated the original arch, and allowed it to dry slowly. Figure 5.6 illustrates the setup for this drying procedure. After several cycles of humidification and drying, the back plate eventually became more flexible, well-arched, and stable. Figure 5.7 is a detail of the completed back reinstalled on the guitar. Although not clear in the illustration, the curvature of the back is quite acceptable. This technique of controlled deformation has applications anywhere that a thin piece of wood needs to be flattened, as in certain elements of organ wind-chests or thin case panels.

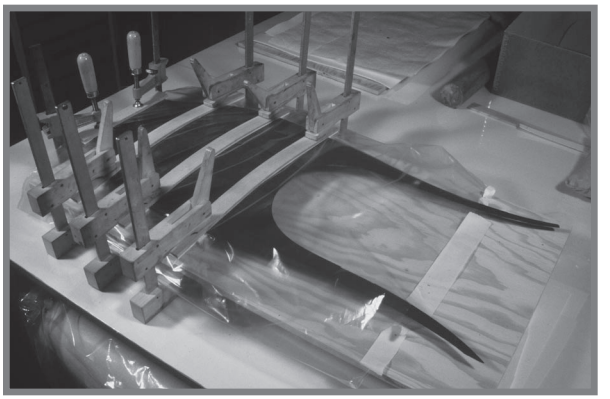

FIG. 5.6. *Restoring the contour of a lyre guitar back plate using the principle of hysteresis. In this step the piece is clamped to a form for final drying.*

FIG. 5.7. *The lyre guitar back after treatment.*

Traditional methods of cleaning wood surfaces can be very intrusive, washing dirt into the pores of the wood, or causing loss of historic tool marks and other evidence through abrasion or swelling of the wood fibers. A tool often used in the conservation lab is very inexpensive and low-tech, but effective and relatively non-intrusive—the vinyl drawing eraser. These can be used in either block or grated form, and can be very effective for removing dirt from uncoated wood surfaces throughout the interior of organs.

I used a vinyl eraser to clean the ivory keys of the Samuel Green organ. After years in storage, the keys were very dusty as well as soiled and discolored from many years of use. I dusted them with a brush, followed by cleaning with a vinyl eraser that removed most of the imbedded surface dirt. The vinyl eraser has very little abrasive quality but is excellent at picking up dirt. Other types of art eraser have been tested, but they are usually some form of rubber and leave an undesirable residue behind. We have found vinyl to be best suited for this type of cleaning.

Mildew or other protein-based stains cause some of the discoloration that is traditionally removed with abrasion and other intrusive methods. Conservators sometimes use enzymes capable of attacking the offending protein without affecting the object's surface beneath. Again, the biochemistry may be complex, but the procedure simple, inexpensive, and accessible. The last step in cleaning the ivory was to use a long-respected, mild, natural enzymatic surfactant that every conservator and restorer keeps in stock—saliva.

Our last example of a minimally intrusive conservation treatment is a method of patching deteriorated leather. This is an experimental technique that I tried for the purpose of this chapter, using the table reed organ in fig. 5.8.

FIG. 5.8. *The original bellows leather of this table reed organ was experimentally treated with polyvinyl acetate glue and Japanese tissue paper. The minimally intrusive treatment left the organ playable without loss of original leather and workmanship.*

The bellows leather had deteriorated and cracked. As an alternative to replacing the leather with its evidence of the maker's methods, I repaired the gaps with glue and Japanese tissue paper for reinforcement. Japanese tissue is available in several weights and is made with exceptionally long fibers, so it is strong and flexible. As an adhesive, I chose Elvace 675CX, a polyvinyl acetate, somewhat similar to Elmer's glue.[4] Unlike common white glue, however, Elvace has more of the vinyl component, giving it more flexibility when cured. I started by coloring the tissue with a watery acrylic paint. I then cut the tissue into strips corresponding to the width of the exposed leather on the bellows. I painted the tissue strips with the adhesive and set them in place over the cracked leather. Finally, I painted a thin coat of adhesive on top of the tissue so the slightly glossy sheen of the Elvace would approximate the appearance of finished leather. The visual results of the

[4] Elmer's is a registered trademark.

repair are acceptable, and the bellows function well enough to allow playing. In the event it is necessary for future study or repair, the tissue can be removed by applying acetone to the Elvace. Conservation alternatives are sometimes expected to take too much time, yet the repair took only about four hours to complete—certainly no more than releathering the bellows. This experimental treatment put the instrument back in functional condition with minimum loss to original fabric.

These procedures indicate the type of thinking that underlies problem solving and bench work in the conservation laboratory. While this methodology was developed in conservation labs focusing on stabilization and exhibit of nonmusical museum objects, it is clearly applicable to organ restoration as well. Armed with this specialized knowledge and methodology, an experienced conservator can be a productive consultant to, or member of, an organ restoration team.

6

The Conservation of the Painted Surfaces on the Historic St. Luke's Organ

DAVID GOIST

The author was engaged by Historic St. Luke's Church (HSL) to prepare a written condition examination report and a treatment proposal for the painted surfaces on the chamber organ of ca. 1630. The frontispiece shows the instrument after treatment. The organ was not acquired by the church until after restoration of the building from 1953-57. According to information supplied by the church, the organ was originally owned by the LeStrange family of Hunstanton Hall, Hunstanton, Norfolk, England. It remained in Hunstanton until after World War II when the house was sold. The contents were auctioned in October 1949. The organ was purchased by a Captain Lane who later sold it to the church.

Also on-site during the 25 August 1995, examination was John Watson, Conservator of Instruments, Colonial Williamsburg. The examination took place in Historic St. Luke's Church with the optical aids of a 10x magnifier, a handheld Burton ultraviolet light, and a handheld FJW Optical Systems infrared Find-R-Scope. Six microscopic samples of ground and paint were removed from the designs during examination, later mounted in casting resin and polished for cross-section study. The cross-sections were examined and photographed microscopically under white and ultraviolet light in the office of George Fore, Architectural Conservator, Raleigh, North Carolina. Photographs of three of the cross-sections were submitted with the report.

The examination report and treatment proposal were based on routine and relatively simple analytical techniques. Had more time and funding been available, additional technical study could have been undertaken. Ian N. M. Wainwright offers a variety of options for understanding original designs and later additions.[1]

Examination with ultraviolet light can reveal areas of over-paint as the fluorescence of over-paint, and resinous coatings changes from section to section (see figs. 6.1a-b). A strongly fluorescing surface varnish can obscure retouching underneath. The fluorescing effects under ultraviolet light can be recorded on black and white or color photographic film provided appropriate filters are mounted on the camera lens.

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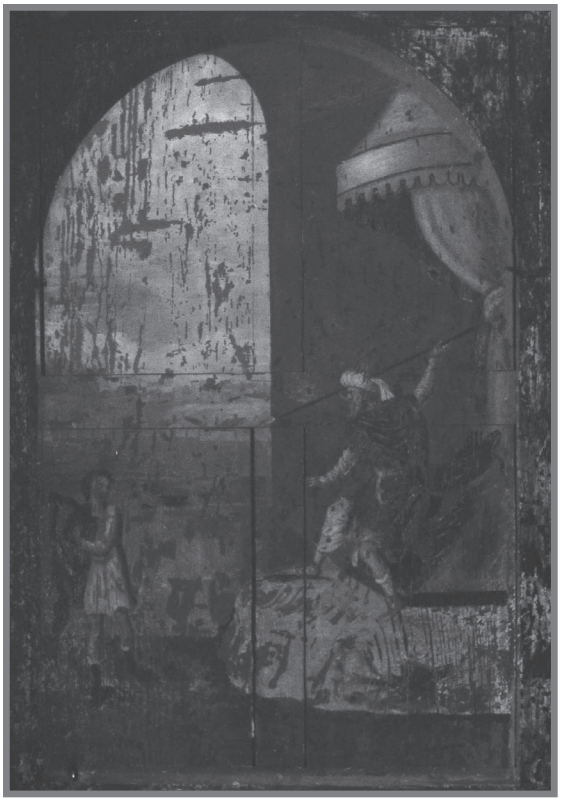
[1] Ian N. M. Wainwright, "Examination of Paintings by Physical and Chemical Methods," in *Proceedings of Shared Responsibility: A Seminar for Curators and Conservators* (Ottawa: National Gallery of Canada and the Canadian Conservation Institute, October, 1989), 79-102.

A



B

FIG. 6.1A-B. *Photographed under ultraviolet light, the doors reveal information about multiple generations of repair.*

Infrared photography can economically record obscured information by means of the use of Kodak High Speed Infrared 4143 film and a Kodak Wratten Filter no. 87 mounted on the camera lens. The FJW infrared Find-R-Scope can help locate areas of useful information to be documented with film. More elaborate and expensive infrared vidicon systems have been used by paintings conservators to create video images of artists' underdrawing and changes.

Paintings and objects conservators have used x-radiography for many years to locate paint losses, structural breaks, and joinery that are not visible to the eye. Many museum conservation facilities have industrial x-ray units. However, analytical services can often be obtained through a medical or veterinary office if the operator can be interested in the project and the artifact can be transported to the machine.

The minute samples of paint layers mounted for cross-sectional analysis can be studied with reflected light microscopes illuminated with white and ultraviolet light. Finding earlier varnish and dirt layers beneath a surface paint is good evidence of later additions. Pigment particles can be removed from the painted surfaces or from the cross-sections

and analyzed by means of polarizing-light microscopy. Because some pigments were not always available to artists, pigment identification can be useful in establishing a possible date of application. More elaborate and expensive analytical techniques are available for more conclusive pigment identification. X-ray diffraction, scanning electron microscopy and x-ray microanalysis, and Fourier Transform Infrared Spectroscopy have been used for paint research in the conservation literature.

Examination of Condition Prior to Treatment

During the examination of the Historic St. Luke's organ, no technical evidence was discovered that would rule out a fabrication date in the early seventeenth century. Photographs of the painted doors were shown to David Steel, Curator of European Art at the North Carolina Museum of Art. He thought the scenes on the doors could have been painted in the seventeenth century by an English, Flemish, or Dutch decorative painter.[2] The painter was a relatively minor artist not having a distinct national style. The images could have been derived from prints having an Italian influence. He confirmed that the titles for the scenes noted below are appropriate.

There is no evidence that A. J. Henry's cleaning of the organ in 1920 involved the paintings.[3] However, evidence of past retouching of the original paint by someone other than the artist was found during the condition examination.

During the treatment phase, the author removed two small pigment samples from each door. The pigment appeared to have a blue-green tone of Prussian blue mixed with white. Since Prussian blue pigment was not commonly used by artists until the 1720s, this preliminary identification would imply that the decoration on the doors was not original to a 1630 construction date. The discrepancy warranted a closer examination. The pigments were mounted as dispersions on glass microscope slides and sent to the Williamstown Art Conservation Center. James Martin reported just before the January 1999 colloquium that, by means of polarizing-light microscopy and FT-IR (Fourier Transform Infrared) Microscopy, he had identified the blue pigment as indigo in an oil medium.[4] R. D. Harley writes that indigo, a pigment known since ancient times, was not used by oil painters after 1700 although it continues in use today as a watercolor pigment.[5] Therefore, it is quite possible

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[2] Telephone conversation regarding the photographs of the doors on 4 September 1995.

[3] Barbara Owen, "The English Chamber Organ in St. Luke's, Smithfield: Some Preliminary Observations," report in church files, 25 October 1993, p. 5.

[4] Information transmitted by email from James Martin, Director of Analytical Services and Research, Williamstown Art Conservation Center, Williamstown, Mass., 8 January 1999.

[5] R. D. Harley, *Artists' Pigments c. 1600-1835* (New York: American Elsevier Publishing Company, Inc., 1970), 62-65.

that the painted decoration dates from ca. 1630. The author has encouraged the Historic St. Luke's organ committee to consider an in-depth technical study of the painted surfaces on the instrument.

1. *Proper Right Door:* David Playing the Harp Before Saul

Size: height, 69.4; width, 47.4; thickness, 1.5 centimeters

Construction: The outer surface of the door is constructed of ten pieces of wood, all estimated to be oak. The joinery techniques are traditional for such a door. Four pieces form an outer frame having mortise and tenon corner joins secured with wooden pins. There are two cross bars, the vertical muntin and the horizontal lock rail, which have a half-lap center join fixed with two wooden pins. The outer frame (stiles and rails) and the cross bars (muntin and lock rail) are 1.5 cm. thick but vary in width. The vertical hanging stile piece is 4.3 cm. wide, the muntin is 4.0 cm. wide, and the vertical hanging stile is 3.5 cm. wide. Four separate oak panels fill the spaces between the framing and are presumed to be held in place by tongue and groove joinery. The edges of the front surfaces of the oak panels are beveled. Additional small panels of wood, estimated to be pine or spruce are adhered to the inner surfaces of the oak panels, raising the panels to the same plane as the rails and stiles. Therefore one might conclude that the flat surface was originally constructed to be decorated.

On the design side, the ground or priming layer on the wood appeared to be water-soluble and cream-white in color. It is probably calcium carbonate pigments in a hide-glue binder which is a typical ground for fourteenth- to seventeenth-century Northern European panel painting. The cross-sections indicate the ground was applied in several layers, from thinner to thicker in pigmentation. A sizing was applied over the ground to make it less absorbent of the paint medium. The ground is so moisture sensitive that it would disintegrate if aqueous-based adhesives were used for consolidation and reattachment to the wood.

The paint is characteristic of pigments in a drying-oil medium applied as a thin vehicular paste. There is some low impasto texture in the clouds of the sky. The layering structure is very simple with each design element consisting of one or two layers. A cross-section removed from the visual[6] upper left where the sky meets the arch indicates the lighter sky tone ends near the compositional join line with the darker arch lying on top.

During the on-site examination, the author believed the paint to have a thin oil varnish coating as indicated by a small amount of fluorescence under ultraviolet light, yet only a few points in the cross-sections could confirm a coating. It is possible that the samples could have lost a coating during removal and preparation. The coating does not exhibit much discoloration and was not soluble in acetone solvent. Because it may be an

[6] Editor's note: In conservation and art history literature, the term *visual* and *proper* are used to clarify the meaning of left and right—is it your right or the object's right? Visual right is your right while proper right is the object's.

original coating, it has not discolored much, and is not very soluble, it is recommended that no attempts be made to remove the varnish.

Condition: Both doors are torsion warped, keeping them from closing fully. In addition, compression shrinkage across the vertical wood grain of the four laminated panels of each door has made the panels smaller than when originally painted.

Compression shrinkage begins during periods of high humidity when wood panels swell. If the wood is restrained from swelling, their fibers will be slightly crushed, causing the panel to grow smaller in width when the humidity returns to lower levels.[7] Compression shrinkage is not reversible. Since the ground and paint do not experience similar shrinkage, they have a tendency to cleave from the wood support (see fig. 6.2). Displaying the instrument at high humidity, therefore, will not close the gaps between the panels and framing.

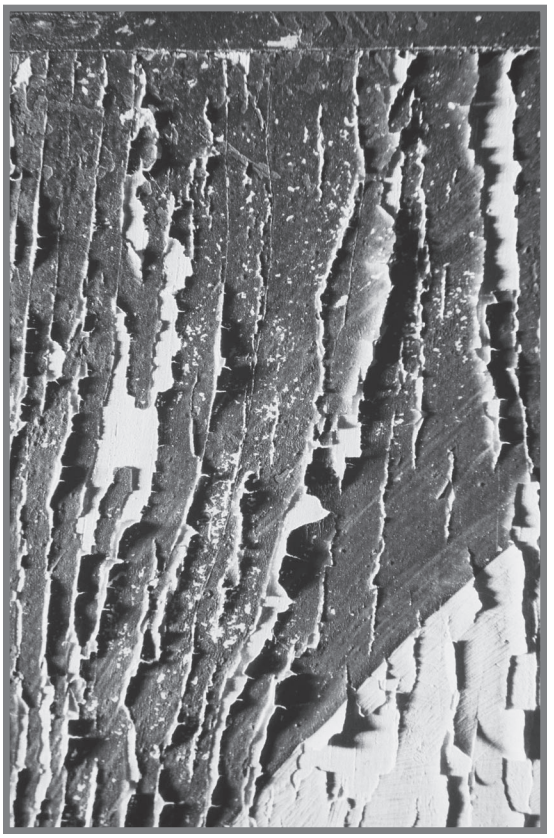

FIG. 6.2. *Detail of the door paintings before treatment. As wood expands and contracts during fluctuations of humidity, stress builds between it and the dimensionally stable paint layer, causing loss of adhesion.*
Photograph by John Watson

[7] For more about the effects of compression set shrinkage in panel paintings, see R. Bruce Hoadley, "The Dimensional Response of Wood to Variation in Relative Humidity," *Preprints of Conservation of Wood in Painting and the Decorative Arts* (London: The International Institute for Conservation, Oxford Congress, September, 1978), 1-6.

The gaps between the vertical framing and the panels range from 0.1 to 0.3 cm. There are a few losses of wood at the corners due to handling and wear. Small checks have occurred in the wood around the wood joinery pins and nail and screw holes.

The inside decorated surface of both doors exhibit active cleavage of ground and paint rendering the panels very fragile. Most of the damage is due to expansion and contraction of the wood during fluctuations of relative humidity. Because the panels have shrunk, there is a continual tendency for the ground and paint to break free of the wood surface.

A photograph of the organ (fig. 6.3), was taken for the 1928 article on Hunstanton Hall in *Country Life*.[8] It is significant for showing the condition of the painted doors after three hundred years at Hunstanton Hall, but before its relocation to the collection of Captain Lane and then Historic St. Luke's. The photograph shows only a slight amount of paint loss and slight cracks between the pine insert panels and the oak framing, but not to the degree found in 1995.

A digital thermo-hygrometer placed near the organ during the on-site examination indicated a temperature of around 67 degrees Fahrenheit, and 47-54 percent relative humidity. If 70 degrees Fahrenheit plus or minus 5 degrees and 50 percent relative humidity plus or minus 5 percent could be maintained all year, the remaining bond between wood and paint would be better preserved. A range of 40-60 percent is the minimum-maximum for relative humidity levels to limit dimensional changes in wood.

Paint loss has also occurred due to mechanical abrasion of the surface. Three major horizontal gouges (6.5, 8.0, and 5.5 centimeters in length) plus smaller ones were observed in the upper left panel.

There has been some retouching in the past of old paint losses. Due to discoloration, additions are most noticeable around the head of David and on the rock below Saul. The retouching was not soluble in acetone where tested, indicating a further degree of complication for possible future treatment.

There was a gray grime accumulation on the painted surface as well as spots of former mold growth which are now dark gray. Aqueous emulsions of water, Triton X, xylene, and other additives seemed effective in removing much of the grime but not the mold which was growing in the layers.

2. Proper Left Door-Jephthah's Daughter

Size: height, 69.3; width, 47.9; thickness, 1.5 centimeters

Construction: The construction of the proper left door is similar to that of the proper right door. The hanging stile is 4.5 cm. wide, the muntin is 4.0 cm. wide, and the shutting stile is 3.5 cm. wide including a .5 cm wide flange. A lock (7.0 x 7.0 cm.) is attached to the

[8] Christopher Hussey, "Hunstanton Hall—Norfolk: The Seat of Mr. Charles Le Strange [part] II," *Country Life*, 17 April 1926, plate 20, p. 594. The photo was recently reprinted from the original negative for Dominic Gwynn, who kindly provided it for the current study of the organ.

FIG. 6.3. *The Historic St. Luke's organ photographed at Hunstanton Hall in 1928.*

Photograph courtesy of Country Life Picture Library and used by kind permission

lock rail, lock stile, and visual upper right painted panel of the door. It should be removed during a later examination to look for holes and marks from any previous locks and to evaluate the paint under the inner plate.

On the decorated side, the ground, paint, and varnish application is similar to that of the proper right door. A cross-section was removed from the sky in the visual upper

left panel. The mounted and polished sample revealed a simple structure of off-white ground, sizing, and near-white sky (having little colored pigment).

Condition: The proper left door was in the same fragile condition as the proper right door. In addition to the compression shrinkage gaps between the muntin and the panels, some checks—or incomplete splits—within the panels were noted. The longest check in the visual lower left panel is also an interlayer separation. The wood under the paint can be pushed inward but the wood on the other side of the door does not move. Other checks were found in the visual lower right and upper left panels.

Some moldings were missing from the outer edges of the panels. John Watson later reported that there were some moldings saved and stored in the cabinet. The moldings would be reattached during the present treatment. Missing sections should be reproduced. There was much cupping, cleaving, and loss of ground and paint from the inner surface due to dimensional changes in the wood. The largest mechanical damage is an arcing gouge (16.0 cm. long) in the upper part of the lower right painted panel. The surface displayed the same possibility of a thin oil varnish, gray grime, and various accretions including insect deposits.

3. *Lower Pipe Shade-checkered floor in perspective*

Size: height, 17.5; width, 89.5 (across bottom); thickness, 1.2 centimeters (at bottom)

Construction: The wood support is essentially trapezoidal in shape and judged to be oak. The bottom corners are squared to a height of 1.2 cm. The inwardly sloping shoulders are 45.5 cm. in length. The top edge is 8.0 cm. in width. On the back of the main oak panel, a border of pine wood strips has been adhered to the three upper edges. At the bottom edge, another strip of oak, 0.8 cm. thick, has been adhered to the main oak panel which is 0.4 cm. thick. To the back center, a small oak block has been glued and supports a hand-forged metal angle screw. A metal pin protrudes from the bottom center.

The painted design consists of a white ground and a paint layer. Along the proper right bottom edge, one can observe a run-over of ground and paint. The ground appears to have air bubbles suggesting it has an aqueous binder. The paint is not water soluble and is judged to have a drying-oil medium although it is very matte. Both ground and paint are thin enough to permit the texture of the oak wood to show through. There does not appear to be any varnish layer.

Condition: The oak support has a concave warp, but is otherwise in very good condition. The ground and paint are also in relatively good condition with only a few small losses associated with the pits of the horizontal wood grain plus scattered scratches and abrasions. There was an oily gray grime accumulation and dark oily hand prints on the paint. The proper left lower edge was test-cleaned using an emulsion of water, Triton X, xylene, and additives followed by clearing with xylene and saliva. It appeared that much of the grime could be removed.

4. Upper Pipe Shade-barrel vaulted ceiling

Size: height, 34.0; width, 89.3 (across top); thickness, 1.0-0.1 centimeters.

Construction: The main support consists of four boards judged to be pine. The longest (across the top) is 19.7 cm. wide (or high) and 1.0 cm. thick. Continuing from top to bottom, the next three boards are: 4.2, 4.3, and 5.8 cm. wide (or high). The bottom board has a semi-circular cut-out to create the end of the barrel-vaulted ceiling to be continued on the center support shade (no. 5 below) as a painted illusion of an apse in a church.

There are separate small triangles of pinewood, six on each sloping side, glued to the edge of the main support. The triangles nest into the facade pipes which in turn are painted to appear as columns along the nave of a church. The joins between the triangles and the main support are reinforced on the back with paper that has been folded over to the front before painting. In raking light one can see the edges of the paper under the paint. At the visual upper left corner, the paper was delaminating. On the bottom of the back of the pine support is found a wood bracket held in place with what appears to be a screw.

As found on the lower pipe shade, the paint on the upper pipe shade is also matte. No traces of a ground layer were observed, although it may exist. The paint is not water soluble and is judged to have a drying-oil medium. There are decorative designs arcing over the paint surface which are done in gold and/or bronze particles estimated to be adhered with oil mordant. As with the lower pipe shade, the paint on the upper pipe shade did not appear to have a varnish coating.

Condition: The proper left tip of the arch was broken off. The paper was exposed and lifting at the proper right upper edge. There were cracks and lifting of the paper along the proper left edge. The paint exhibited scattered scratches and abrasions. There was a sine-wave scratch to the right of center. Discolored retouching was noted at the top center. The surface had a gray grime accumulation, largely from handling, which had darkened the paint. Some of the grime could be removed with the same system as tested on the lower shade.

5. Center Support Pipe Shade-church apse

Size: height, 24.9; width, 7.8; thickness, 1.4-1.9 centimeters

Construction: The center pipe shade consists of a single piece of oak wood. It is 1.9 cm. thick at the bottom edge and 1.4 cm. thick at the upper edge. One 0.5 cm. oak cube is glued at the proper upper left edge serving as a support for the upper pipe shade. The cube on the proper right was missing and needed to be replaced. On the back is a L-shaped oak bracket, 6.2 cm. high, adhered with glue. Below the bracket, on either side of the back, are two square notches which receive diagonal support rods.

The paint is applied so thinly to the wood that the grain is evident. No ground layer could be observed, although a very thin one may well exist. The painted design of the church apse continues the illusion of a nave created by the painting on the display pipes.

Condition: The main block of the center shade is in stable condition. The 0.5 cm. cube at the proper upper right was missing. The painted design appears indistinct, perhaps diminished by harsh cleaning with solvents in the past.

6. *The Thirty-six Display Pipes*

Construction: The limited on-site examination time did not permit in-depth review, measurement, and documentation of the individual pipes. The front surfaces of the pipes are painted to produce the illusion of columns decreasing in height due to perspective as they line the nave of a church. The pipe surfaces alternate between the lighter fronts of square columns, the side of the square column in shadow, and a blank gray pipe to serve as a space between columns.

A ground and paint cross-section was removed from pipe #7. There is a thin gray paint layer over the pine wood. A thicker brown layer is thought to be an oil mordant to adhere the gold leaf part of the design.

Condition: The condition state and repair needs of the pipes were beyond the scope of the pre-treatment condition report and the expertise of the examiner. There were scattered abrasions and accretions on the paint, but not much of the current design has been lost. Further examination is needed to determine whether the pipe surfaces have been significantly repainted. Although if they have been repainted, removal of the later paint would not be recommended.

Summary of Condition and Goals of Conservation Treatment

It was obvious that the painted surfaces of the two doors were extremely fragile and in urgent need of treatment. The proposed approach to consolidation of ground and paint layer was the same as would be recommended for the treatment of a European easel panel painting. As a cost-saving measure, filling and in-painting of the many losses of ground and paint would not be proposed. Leaving the wood exposed is an approach one often sees in Europe where large losses have occurred in panel paintings. However, the deep gouges which cut across the composition would be filled in-painted because they were so disfiguring. It was recommended that a protective varnish be applied to the paint on the doors as a protection against future abrasions and mold growth. The outer oak surface would not be treated to keep it in color harmony with the rest of the organ cabinet.

Most of the thin moldings missing from around the panels on the front of the doors were stored within the cabinet. A short missing section will need to be reproduced. It was not recommended that any attempt be made to remove the torquing distortions in the doors. Attempts to straighten the wood are likely to introduce more stress and strain at the bond of ground and paint, therefore causing more cleaving and loss.

After consolidation of the ground and paint, as much of the gray grime would be removed as safely and evenly as possible from the three pipe shades and the thirty-six display pipes. Since a varnish might darken and alter the matte paint, none was recommended for application. After treatment, painted elements should be handled only with gloves.

No technical evidence was observed during the on-site examination that would rule out a fabrication date for the painted elements in the seventeenth century. With more microscopic or pigment analysis, additional dating information may be learned. It is also the writer's opinion that the wood supports were originally intended to be painted.

Treatment of the Painted Doors

The doors were transported to the conservator's studio in Raleigh, North Carolina, on 25 January 1996. Consolidation of cracked, cupped, and cleaving ground and paint began with tests of aqueous adhesives proposed after the on-site examination of 25 August 1995. The white ground was so moisture sensitive that traditional approaches of reattaching ground and paint to wood panels could not be used. Polyvinyl acetate resin AYAA (five percent in ethanol) was applied as an adhesive to all cracks lines. Consolidation to the wood panels was completed by application of warmth and gentle pressure from a small tacking iron. It became evident that the initial adhesive application was not strong enough to bond the ground and paint to the panel. Over the next six months, additional very dilute PVA-AYAA and BEVA 371 ethylene vinyl acetate adhesives were applied to the cleaving areas followed by use of the tacking iron. After each session, the panels were observed for signs of new cleaving. The adhesive was applied minimally to avoid saturating the thin, porous white ground. Saturation would make the ground layer more transparent to the darker pinewood panels below.

Surface grime was removed using an aqueous solution of ammonium citrate adjusted to pH 7, applied with small cotton swabs gently rolled on the surface. Some areas were treated with an emulsion of water, xylene, and Triton X-100. Cleaning solution residues were removed with toluene solvent. More gray grime was removed from the surface with toluene. After grime removal, additional paint consolidation treatment was needed. This was partly accomplished with Poly (2-ethyl-2 oxazoline) resin, known as Aquazol 50, dissolved twenty percent in distilled water followed by relaxing warmth from the SP brand hot air tool and pressure from the tacking iron. The previous consolidating resins had made the ground less water sensitive.

A thin brush application of Acryloid B-72 acrylic resin (ten percent in xylene and toluene), was used as an isolating varnish layer. The larger losses and horizontal gouges were filled with a white, water-soluble putty. Because the exposed pine or spruce wood exposed by paint losses was now slightly darker than before treatment due to saturation from the adhesives, more filling and hence in-painting would be required than had been anticipated. In-painting was begun with Charbonnel acrylic resin paints made by the French

firm of Lefranc & Bourgeois. Additional spray coatings of Golden brand MSA acrylic resin varnish (three parts gloss to one part matte), dissolved ten percent in naphtha and toluene were applied. On 25 November 1996, HSL curator Richard Austin and organ committee member Fran Olsen visited the studio to view progress of the in-painting and to discuss how much further to take compensation.

It was agreed that the sky and gouge areas would be in-painted according to the standards used in easel painting, while the vertical paint losses of exposed wood would be toned with a common average color. Little in-painting was to be done to the dark outer borders beyond adjusting the tones of the earlier discolored over-paint. The goal of the in-painting was to render the images readable by reducing the visual distractions of the paint losses. The results would not hide the history of use and wear of the historical instrument. In-painting continued as agreed with intermittent spray applications of Golden MSA (three parts gloss to one part matte) which produced the sheen of an oil paint surface.

The loose moldings from the outer panels were re-adhered with hot hide glue. Part of one molding from a bottom panel of the proper right door needed to be reproduced and added. The hinges were removed from the proper left door and the splits were consolidated with hot hide glue and clamped. All the modern wood screws were removed and replaced with shorter ones. The heads were toned with raw umber Charbonnel paint. Two pins in the bottom hinge of the proper right door, were left in place. Holes left from other screws and hinge attachments were not filled in order to leave evidence for later study. Four new hinge pins were made from modern wire nails, cut and colored.

Samples were taken of the pine or spruce wood from under the lock plate, proper left door. A sample of blue pigment was taken from each door for future identification (figs. 6.4a-b).

Treatment of the Thirty-six Display Pipes

The doors were returned to Smithfield and reattached to the organ on 8 March 1997. The shade panels and display pipes were removed, packed and transported to Raleigh. The panels and pipes were documented photographically. A diagram sheet was created to note identifying marks and special condition factors for each pipe. Measurements of the pipe body length and foot length were recorded on the sheets.

Removal of surface grime from the painted surfaces of the thirty-six pipes consisted of three steps. First, an emulsion of water, xylene, Triton X-100, plus ammonium citrate was applied on small cotton swabs gently rolled on the surface. Second, a dilute solution of ammonium citrate was similarly applied. At this stage, most of the safely removable grime, was gone. The third step consisted of similarly applied toluene solvent that removed a little more grime and any residues of the first two solutions. Toluene was used to remove residues of pressure sensitive adhesive from the back, unpainted wood surfaces of the pipes. Also, some of the pipes that were painted very thinly with only gray paint did not

A

B

FIG. 6.4A-B. *The door paintings after treatment.*

receive any aqueous cleaning mixtures. During cleaning, the wood was kept dry to minimize dimensional changes.

Some areas of the C pipe from the proper right side were lighter in tone. Apparently, when the painted surfaces of the pipes received a thin application of a drying oil, the two noted areas were missed leaving the paint less saturated and lighter in tone. The areas were documented under tungsten and ultraviolet light for inclusion in the record of treatment and left as found. Small paint losses on the pipes were sized and consolidated with very dilute Acryloid B-72 then in-painted with matte Charbonnel acrylic resin paints.

Treatment of the Three Pipe Shade Panels

The three pipe shade panels received the same surface grime removal treatment as the display pipes. The lower (floor) screen panel had a heavier accumulation of surface dirt due to its slanting position in the organ. The upper (ceiling) screen panel had less dirt but more uneven discoloration and darkening from hand oils. The challenge of working with the upper panel was to return the paint surface to a more even matte quality. It became apparent that the original matte surface of the paint could not be regained by cleaning. A matte varnish would be needed to achieve an even surface.

Two wood replacement parts were made for the shades. A small cube was cut from oak for the proper right side of the smallest, center shade. A thin and shaped pine piece was cut from a 100-plus year old wood picture frame backing for the proper left bottom arched tip of the ceiling shade. An attempt was made to match the wood grain. Both additions were adhered with CM Bond M-4 white emulsion adhesive and toned with dilute, matte Charbonnel acrylic resin paints. This adhesive was selected over hide glue because it is soluble (removable) with a nonpolar solvent. Since hide glue is removed with water—a polar solvent—the grain of old wood swells obscuring surface evidence. A second reason for using a modern removable solvent is to make the intervention distinguishable from early work.

Lifting sections of paper or parchment at the points of the ceiling shade were consolidated with Lineco neutral pH polyvinyl acetate emulsion adhesive and slight warmth and pressure from a tacking iron. The three pipe shade panels were given general consolidation and sizing with a three percent solution of Acryloid B-72 in xylene applied by spray. In-painting of the paint losses and abrasions on the panels was completed in dilute and matte Charbonnel acrylic resins paints.

In order to achieve an even matte surface on the panels as originally intended, to overcome some of the unevenness in the ceiling shade due to insoluble hand oils, and to provide some protection from further handling, the three panels received a final coating. This consisted of several spray applications of Golden brand MSA matte acrylic resin varnish with ultraviolet light stabilizer diluted to ten percent in naphtha and toluene.

The panel and pipes were packed, returned, and reinstalled in the organ on 9 June 1997.

Part 3

The Historic St. Luke's Organ: A Case Study

7

Reflections on a Chamber Organ

Barbara Owen

Definition

> What is this thing we're talking about? Which of its attributes constitute its individuality and its value, or determine its potential? In other words, what is it that makes this thing worthy of notice?
>
> Dale Carr[1]

This step in the process seems obvious, yet it is easy to overlook it. How can we proceed unless we make some attempt to answer these questions? The first, of course, is easy; we're talking about a seventeenth-century English chamber organ. It is the second question for which everyone will have somewhat different answers. Though perhaps not as different as those of the blind men asked to describe an elephant, answers will be different in degree or emphasis.

Some answers can be gleaned from the organ's *biography*.[2] There is precious little left in the way of organs (or even fragments of organs) from early seventeenth-century England on which to base the age of the organ. Its condition is remarkably intact, with evidence of only one significant revision, and it has remained playable for a rather significant part of its life. Its associations are with the LeStranges and John Jenkins—important musical figures in the early seventeenth century.

Further answers may be a bit more subjective. With its unique "perspective" painted facade and fine cabinetry, the organ is visually attractive. It is an example of a type of instrument for which significant music (the literature for viols and organ) was written during a rather brief period. It is something from which historians and instrument-makers as well as musicians might learn. And, it is something that has been treasured by its former and present owners and guardians.

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[1] Dale C. Carr, "With What Aim and Purpose, and to What End, Should Historical Organs be Restored?," *Organ Yearbook* 24 (1994): 1-40.

[2] See definition below by Friedrich Jakob and n. 3.

While not everyone may attempt the answers to the second question quite as briefly or in exactly this same manner, I rather doubt that anyone will deny that this small organ is indeed fully "worthy of notice."

Biography

> The first task probably is always the writing or rewriting of an existing "biography" of the instrument to be restored; because, after all, one has to start somewhere. . . . As a matter of principle, question marks have to be placed everywhere.
>
> Friedrich Jakob[3]

The biography of the little chamber organ in Historic St. Luke's Church, Smithfield, Virginia, begins with a question. Just what, truly, *was* this attractive and interesting piece of old musical furniture which, since 1957, had stood, silent for many years, in this historic building? Despite the many visitors to Historic St. Luke's Church in Smithfield, surely including the occasional organist or historian, it was a long time before this question was seriously asked. The organ had arrived quite unheralded, along with other period furnishings, at the time the building underwent some restoration work, and it was claimed to be "a signed work" of the Restoration-period organ builder Bernard Smith.[4] About a decade later in his detailed study of English chamber organs, Michael Wilson makes mention of an anonymous "positive organ and stand," with painted doors and an "architectural" display of wooden facade pipes, which had been purchased in 1949 from Hunstanton Hall by the collector, Capt. J. Lane of Essex. And Wilson asks another question: "What were the present whereabouts of this instrument?"[5]

Here begins the paper trail that would ultimately lead to the Smithfield organ. When the contents of Hunstanton Hall were put up for auction in October of 1949, "In consequence of The Hall having been sold," a catalog was published which listed as item 581 "The Unique Tudor Organ—A Positive Organ in panelled oak case, the painted front pipes of wood mounted in perspective (ca. 1660). The inner sides of the folding doors are painted with representations of David before Saul and Jephthah's daughter. The Organ has a compass of four octaves and is in playing order." If this verbal description were not enough to identify the instrument with the one now in Historic St. Luke's Church, the accompanying photograph left no question.[6] Thus was Mr. Wilson's question answered,

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[3] Friedrich Jakob, "Basic Remarks About Organ Restoration," *ISO-Information* 32 (November 1990): 57-70.

[4] James Grote Van Derpool, *Historic Old St. Luke's: Its History and Restoration* (Smithfield, c.1958), 9.

[5] Michael Wilson, *The English Chamber Organ* (London: Bruno Cassirer, 1968), 100.

[6] Catalogue: *Hunstanton Hall, Norfolk. Extensive Sale of Decorative Furniture* (King's Lynn: Cruso & Wilkin [auctioneers], 1949).

and progress was made along the paper trail that would ultimately push back by thirty years the construction date which had been suggested by the eminent early twentieth-century organologist, Canon Galpin.[7]

Hunstanton Hall in Norfolk was, from the fifteenth century to the twentieth, the seat of the LeStrange family, who were well documented for their activities in musical circles in the seventeenth century. Particularly notable were Sir Hamon LeStrange (d. 1654) and his sons Nicholas (1604-55) and Roger (1616-1704). It was to the latter that Matthew Locke dedicated his *Melothesia*, one of the earliest English printed collections of keyboard music. Among the musicians who lived at Hunstanton Hall as music tutors and members of the household viol ensemble were Thomas Brewer (1611-post 1650) and John Jenkins (1592-1678). Along with Alfonso Ferrabosco, John [Giovanni] Coprario [Coperario], and William Lawes, Jenkins was one of the most noted composers of music for organ and viols in the seventeenth century. Many of his works are preserved in manuscripts formerly owned by the LeStrange family.[8]

The noted English musicologist Andrew Ashbee has done extensive research on Jenkins and the LeStrange family. When asked if he knew whether there had been an organ at Hunstanton Hall in the early seventeenth century, he kindly supplied a handwritten page of excerpts from the account books of 1621 to 1642 by Lady Alice LeStrange (wife of Sir Hamon). There, among a multitude of payments for "song bookes" and "voyall [viol] stringes" as well as to "Musitians," "a Trumpetter," "a Singing Woman" and a Mr. Griffin who tuned the virginals, is an entry dated 1630; £11 paid "for a payer [pair] of Organs."[9] Unfortunately, no name of a maker or vendor is mentioned, so while the paternity of the LeStrange organ remains unknown, Lady Alice has provided us with a "birth date" which is consistent with the style of the cabinetry, door paintings, and construction details of the instrument.

With the Colloquium of January 1999, and the concomitant dismantling and study of the Smithfield organ by a team of organ builders, conservators, and historians, "internal" biographical evidence began to emerge. Supporting the date in the LeStrange account book was a scrap of parchment bearing the date 1631, used to seal a split seam in one of the larger Stopped Diapason pipes. Assuming that the parchment was from a redundant document that was "recycled" in this fashion, the repair probably was done a few years after the organ was acquired, perhaps even by Mr. Griffin, who was still tuning the LeStrange virginals as late as 1635. The same bit of parchment also contains the name of Allestree, a town near Derby, but this may be of no great significance.

Internal evidence also points to a very early modification of the soundboard (and stop action) by the addition of a "piggyback" bass pallet box and channel board. This provided a better wind supply to the bass pipes of the Stopped Diapason, some of which

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[7] Christopher Hussey, "Hunstanton Hall, Norfolk–II," *Country Life* (17 April 1926): 586-95.

[8] Andrew Ashbee, "A Further Look at Some of the LeStrange Manuscripts," *Chelys* 5 (1973-74).

[9] Manuscript excerpts from account book of Lady Alice LeStrange, supplied by Andrew Ashbee.

had their upper lips lowered, probably at the same time. This would suggest that the speech of these pipes was weak and unsatisfactory when the organ was completed, and was later corrected, possibly by the original builder. However, the household accounts make no mention of repairs to the organ, and the builder may thus have made the modifications at his own expense, perhaps even before the organ was delivered to the LeStranges.

Thomas Brewer was teaching young Roger to play the viol around 1635-36, and around 1644 John Jenkins came to reside at Hunstanton Hall, remaining until about 1650. Some of his music for viols and organ seems to have been written in this period. But 1654 and 1655 saw the deaths of two of the viol players, Sir Hamon and his son Nicholas (Roger had removed to London about a decade previous), so it is quite probable that the little chamber organ received very little use after the middle of the seventeenth century.

Nonetheless, it would appear that the organ was repaired in the middle of the eighteenth century, perhaps to make it usable after a period of silence. Several pieces of newer parchment, sometimes glued over older parchment, were found sealing the channel boards. Dates of 1736 and 1758 were found on these recycled scraps. The paper trail sheds little light on exactly when these repairs were made, but it does suggest who might have required them. From 1746 to 1768 the only inhabitants of the Hall were the widow Armine LeStrange Styleman, daughter of Sir Henry LeStrange, the sixth and last baronet, and her son Robert, said to have been "a trifle wanting." They are said to have lived in only a small corner of the vast complex, and nothing is known of their musical proclivities. However, it does seem possible that Armine might have desired to put the old organ back into playing condition for her own use. If so, the repairs would have been made between 1758 (the date of the most recent parchment) and Armine's death in 1768. Hussey reports that "from 1768 to 1835 the hall had been uninhabited, though fully furnished, following the dying out of the direct line in Armine Styleman. . . ."[10]

In 1835 Henry LeStrange Styleman, Armine's great-grandson through Robert's younger brother, returned with his family to Hunstanton, rearranged his name to Henry Styleman LeStrange, and became the founder and planner of the nearby resort area. In 1852, while he and his family were on vacation in France, the Elizabethan west wing of Hunstanton Hall was gutted by fire. By the efforts of the gardeners, firemen, and villagers, "all the pictures and much of the furniture were saved."[11] It is unknown whether the organ was part of the furniture so hastily rescued, but this cannot be discounted in the light of the next concrete piece of internal evidence, which surfaced during the recent examination.

It has been evident for some time that some fairly major work was carried out on the organ in the mid nineteenth century, for a number of pipes (mostly smaller ones) were replaced, various repairs made, and an entirely new wind system installed. The original wind system almost certainly consisted of two bellows mounted atop the organ case and

[10] *Country Life*, op. cit.

[11] Ibid.

operated by a person other than the player, as would have been typical in the early seventeenth century. The present system consists of a small foot-operated feeder, located under the pallet box where the largest pipe of the Stopped Diapason once was. It is connected to a nineteenth-century double-rise bellows with an inverted fold at the top of the case—all rather ingeniously worked out. Inside the bellows, organ builder George Dawson of Cambridge and his apprentice, John Thomas Surrey, inscribed their names, along with a date of August 1855. Coming only a few years after the 1852 fire, it is possible that the organ had been damaged, and in any case was likely to have become inoperative after long years of disuse. The nineteenth-century LeStranges, who seem to have been very prone to fixing things up, may simply have decided that they wanted it made playable again—or perhaps instead, it was a member of the family harboring some of the old LeStrange musical genes who desired to play it. Little is known of the organ builder Dawson; he worked in Cambridge (at 94 Castle Street in 1855, later at other addresses) from around 1852 to around 1858 and is known to have restored other antique organs.[12] The quality of his work on the Hunstanton organ is neat and professional.

Nothing more is heard of the Hunstanton organ until 1926, when it is mentioned in the extensive article which appeared in *Country Life*. According to the article, the organ was located in a room known as "the priest's room," although it was said to have once been in the chapel, on the stairs. Canon Galpin was of the opinion that it dated from the Restoration period and might be the work of John Loosemore (1613-81) or Robert Dallam (1602-65). Although we now know Galpin's probable date was thirty years too late, one of the Dallams cannot be ruled out as a possible maker.

In 1926 the organ was still playable. "It is in excellent condition, emitting clear, fluty notes, and, with a few adjustments, would be in perfect order."[13] The "few adjustments" may have been made a few years later by one A. J. Henry, who wrote on the back of the fallboard above the keys that he had "cleaned and renovated" the organ in August 1932. His work appears to have been quite minor, although he may have been responsible for some bits of coarse paper pasted over cracks, and red paint used to seal other cracks. The next record we have of the organ occurs in 1938, when it was loaned by Bernard LeStrange for an exhibition at the Royal Society of Arts, London. It is not known whether it was played on this occasion.

On the board where Henry's note was found, there is also a later notation by Noel Mander stating that the organ came from Hunstanton Hall, as well as the words "B. Smith" written in backhanded block letters in black ink. This is presumably the source of the notion that the organ was a "signed" work of Bernard Smith. The inscription does not remotely resemble any known signature of Smith, and was in all probability made by Capt. Lane, who purchased the organ in 1949. Noel Mander, who knew Lane, and who later

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[12] *The Freeman-Edmonds Directory of British Organ Builders* (British Institute of Organ Studies, 1996), 144.

[13] *Country Life*, op. cit.

packed the organ for shipment to Smithfield, felt fairly sure that this inscription was Lane's doing, noting that Lane "had a phobia about Bernard Smith, and thought that every old organ was by him."[14]

At the time of its sale in 1949 the organ was again said to be playable, and even after its arrival in Smithfield in 1957 several people affirm that, for a while at least, it could still be played. But dry heat, rodents, and the ministrations of an amateur organ tinkerer all soon rendered the instrument silent. Nonetheless, all evidence points to the fact that from the time of its renovation by Dawson in 1855 until more than a century later, the organ could be played and heard, and this is rather significant.

* * * *

Treatment

> The news that a rare instrument is to be restored . . . provokes anxiety among scholars who fear that the process will result in physical damage and loss of evidence. Without restoration, however, an instrument gives practically no indication of its musical qualities, in contrast to paintings or sculptures whose artistic qualities are often obvious even when they remain in a damaged state.
>
> John Barnes[15]

The paradox is that purely visual objects—from the ceiling of the Sistine Chapel to a piece of Aztec jewelry—are rather routinely restored. When some madman recently slashed up a valuable Picasso, no one seems to have expressed any thought that it should be left in this condition. It was sent immediately for restoration, which presumably means that there is now a small amount of paint on its surface that did not come from Picasso's brush. Furniture, too, gets restored, although in general one is not supposed to sit on the chairs or eat from the tables. And many functional objects are often restored to operating condition. The Victoria and Albert Museum in London contains a whole wonderful room full of restored antique clocks, most of them ticking away and sounding the hours and quarters. Visually pleasing as many of them are, this would be nowhere as interesting a place if they all stood immobile and silent.

It is of course true that in the past some "restorations" have been anything but, and paintings, chairs, clocks, and musical instruments have been altered and/or damaged by cavalier and unscholarly attempts at restoration. It is also true that many ancient objects

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[14] Letter from Noel Mander, 25 September 1997.

[15] *The New Grove Dictionary of Musical Instruments* (London: Macmillan, 1984), s.v. "Restoration" by John Barnes.

are so incomplete or severely damaged that they are truly incapable of being restored, yet they remain useful as study objects for what their remains can tell us. They are musical or artistic dinosaur bones.

Between the dinosaur bones and the intact saurian there are often a lot of way stations. This seems particularly true of old musical instruments, especially keyboard instruments, and especially organs. A truly unaltered example is a rarity, but there are many different degrees of alteration: some major, some minor; some reversible, some not; some worthless, some significant. So often it is an altered instrument, rather than a pristine one, that causes the greatest controversy.

Two such instruments, and the controversies surrounding them, have been mentioned in print recently: the 1599 Ruckers harpsichord in the Handel Haus in Halle, Germany[16] and the 1702 Arp Schnitger organ in the Aa-Kerk of Gröningen, Holland.[17] In the case of the Ruckers, its alterations appear to have been minimal, and some have deemed it a good candidate for restoration, yet it was decided not to restore it on the basis of some rather shaky reasoning. It was argued that enough Ruckers harpsichords have already been restored, and copies could always be made. Assuming that this unfortunate Ruckers is not further degraded by serving as a study-cadaver for would-be copyists, one can only hope that some later generation will see fit to restore it to playing condition and allow its unique voice to be heard. The Schnitger situation, as Dale Carr has eloquently elaborated in his *Organ Yearbook* article and his illustrated talk at the symposium, is much more convoluted. Because this organ has received some rather significant alterations in its three centuries, important questions are to be answered. If the organ is restored, to what state, and for what purpose, should it be restored? As of 1999 the jury was still out on this one, but the questions are relevant.

Every instrument is unique, and therefore matters must always be judged on a case-by-case basis. It is just as irresponsible to state that every old instrument should be restored regardless of quality, historical significance, or musical relevance, as it is to pronounce—as no less a personage than the director of the Smithsonian Chamber Music Society recently did—that "we have enough instruments that have already been restored, so that those few that remain unrestored should remain as documents."[18] Regardless of whether they are worthless or priceless as either musical media or study objects? Apparently.

During the examination of the organ following the January 1999 colloquium, several facets of the Smithfield organ and its history were studied and discussed. Some basic facts that emerged are these:

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[16] José Vasquez, "The Ruckers Symposium: A Report and Commentary," *Early Music America* 3, no. 1 (spring 1997): 41-43.

[17] Carr, op. cit.

[18] Mark Longaker, "Time Machines," *Early Music America* 4, no. 2 (summer 1998): 21-27.

1. The soundboard and channel boards were modified very early on, perhaps even by its original builder. This was apparently to correct under-winding of the bass octave of the Stopt Diapason, some pipes of which also had their upper lips lowered, probably at the same time and by the same hand.

2. Despite evidence of routine and/or minor repairs in the eighteenth century, the organ remained in its seventeenth-century state until 1855. At that time, the original wind system was completely replaced by one of very different style, several missing pipes were replaced with carefully made replicas, and other minor modifications were made (possibly including the present stop-knobs, and tuning-flaps on the open pipes).

3. Documentary and remembered evidence strongly implies that from 1855 until its arrival in Smithfield, the organ was maintained and remained playable. There is no evidence of any further modification in this period. Although the organ was cleaned and repaired in 1932, and someone attempted to attach a blower to the bellows and pack loose pipe stoppers with plastic foam after its arrival in Smithfield, nothing major or irreversible was done after 1855. However, fairly shortly after being placed in Historic St. Luke's Church, the organ became unplayable as a result of rodent damage and excessively low humidity, caused by the church's heating system. The only restoration work done prior to 1999 was cosmetic—the restoration and stabilization of the case door paintings.

The organ thus had two distinct phases of existence and use. During the first, it was obviously frequently played during the first quarter-century of its existence, and repaired and tuned as needed. After that it may have seen little use until some time in the eighteenth century, when it received some further repairs and presumably was again played for a short time. During a rather long period when Hunstanton Hall was unoccupied, it probably became unplayable from disuse, and seems to have sustained some damage and loss of small pipes.

The second phase begins in 1855, when the organ was extensively repaired and significantly modified, yet in a manner that left the case, soundboard, and surviving pipes in reasonably unaltered condition. Indeed, there seems to have been a conscious effort to leave as much as possible intact. The "modernization" of the wind system was presumably prompted partly by the deteriorated state of the original bellows leather and partly by the desire to make the wind supply operable by the player. In this state it remained playable until shortly after its arrival in Smithfield.

It is clear, then, that what we have here is not "dinosaur bones," but a complete and intact musical instrument, albeit in its second, modified form. Had it remained in a suitably humid and rodent-free environment and received normal professional maintenance and tuning, it is very probable that it would have remained playable. It would seem also

that the organ builders present at the symposium—all experienced restorers—were rather in agreement that the organ could, with virtually no invasiveness, be restored to playing condition in its present (i.e., 1855) form.

The real problem, then, is not with the organ in its present form, but with the organ as it was originally built. It was in its "first form" that it had the greatest musical significance, and the burning question had to do with whether or not an attempt should be made to restore it to that form, replicating missing or altered components as best as possible. I believe that there was something of a consensus not to do this. However, this should not preclude two other options, which may sound a bit like eating one's cake and having it too. The first is that the organ be carefully and professionally returned to playing condition *in its present form.* The second is that while this is in process, careful measurements, drawings, and other documentation be made of all original components to the end of constructing a replica of the organ *as it originally was*.

One great advantage of the playable organ is, of course, in hearing the sound of the original pipes on their original soundboard. This is of inestimable worth in guiding the voicing of the replicated pipes, perhaps the most difficult exercise of all. The value of the replica is that it would spare the original from being dismantled for study again, and would be capable of being moved to other locations for concerts. Indeed, the replica should be housed in and owned by some institution other than Historic St. Luke's. Needless to say, access to the original should certainly be restricted to avoid inappropriate use. This is not to say, however, that having been restored to playability it should not be played by suitable musicians on suitable occasions. Playing the organ would in fact help to keep it in good working order. All that would really be necessary to prevent inappropriate use by tourists or other unauthorized persons would be a Plexiglas cover over the keys and the removal of the easily detachable blowing pedal.

To a historian, it seems that the ending of a century becomes a time for looking back, and this is surely a most pronounced phenomenon at the end of the twentieth century. Nostalgia is rife, paintings and artifacts from previous times command unheard-of prices at art auctions, and even ephemeral objects less than half a century old become pricey "collectibles." Support for historical societies is at an all-time high, books on historical topics roll regularly off the presses, and "period" movies play to full houses. There is a History Channel on cable TV, and enough historical web sites on the internet to give a search engine a nervous breakdown.

One positive result of this is that we are looking more carefully at things we have inherited from the past. What can we learn from them, how should we treat them, and how should they be passed on to the next generation? Nothing is permanent, of course. Two world wars in the twentieth century have destroyed an untold amount of priceless antiques, art works, documents and buildings, and even in times of peace such things are still vulnerable to fires, floods, tornadoes, earthquakes, and human frailty. Remember the flood in the library of Florence a few decades ago? The attack on

Michelangelo's *Pieta*? The fire at Windsor Castle? For that matter, how about the 1852 fire at Hunstanton Hall?

Because we regard as precious and worthy of preservation what we have inherited from the past, there is a great temptation to over-protect such objects to the point of removing them from use and even access. Last year, in my own church, a controversy arose concerning the eighteenth-century weathercock which has always graced our steeple. Some wanted it put in a bank vault and replaced with a replica, while others felt that it should continue to serve the purpose for which it was designed and made over two centuries ago. On removal during steeple repairs, it was found to be in good condition, and, after being photographed and measured, it was repaired, regilded, and set atop the steeple again, where it will symbolically greet the next millennium. I for one am happy with this decision. Perhaps it might last longer in a bank vault, but that is not what weathercocks were made for.

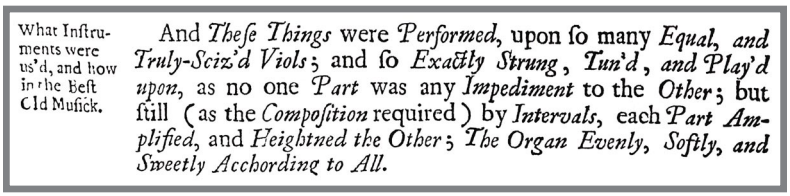
Musical instruments were made to be played and heard. If an instrument is so incomplete as to be beyond anything but highly speculative reconstruction, it still can have value as a research object for those who study, restore, or make similar instruments. The fragmentary "Dean Bargrave" chamber organ in Canterbury Cathedral, an instrument contemporaneous with the LeStrange organ, is a good case in point. It has lost its pipes and many other essential parts, yet it nonetheless has a tale to tell, albeit a silent one. The LeStrange organ at Smithfield, on the other hand, is a complete instrument, although in a somewhat modified state. Until a very recent date it was capable of being played, and, if restored to playability in its present form, there is much that it can tell us musically. Yet it can also be studied and further documented during the restoration process. It will add to the information provided by the Dean Bargrave organ and other surviving fragments, to allow a very faithful replica of an early seventeenth-century English chamber organ to be constructed. The final decisions are, of course, ultimately the responsibility of the organ's owners as well as those who would fund or execute whatever work is to be done. But the implications for the music of John Jenkins and his contemporaries are clear.

8

". . . Softly, and Sweetly Acchording to All." The Historic St. Luke's Organ and Its Contemporaneous Repertoire

CHRISTOPHER KENT

From the viewpoint of the conservation and restoration of contemporaneous instruments, the integral organ parts of these consorts are not without significant evidence concerning matters of pitch, registration, tuning, and temperament. This chapter will offer some further thoughts on the issues of tuning and temperament in the light of the repertoire and of recent essays by Christopher Field and Peter Holman.


What Inſtruments were us'd, and how in the Beſt Old Muſick.

And *Theſe Things* were *Performed*, upon ſo many *Equal, and Truly-Sciz'd Viols*; and ſo *Exactly Strung, Tun'd, and Play'd upon*, as no one *Part* was any *Impediment* to the *Other*; but ſtill (as the *Compoſition* required) by *Intervals*, each *Part Amplified*, and *Heightned the Other*; *The Organ Evenly, Softly, and Sweetly Acchording to All.*

FIG 8.1. *Thomas Mace, Musick's Monument, 1676*

If the organ is "to softly and sweetly accord to all" (fig. 8.1), it follows that its voicing and temperament must be very rarefied indeed, if it is to be compatible with the veiled timbres of viols. Temperament is now a crucial issue when contemplating an historically informed refurbishment of many keyboard instruments, especially organs. In common with many of the issues encountered in this field, possible solutions are rarely simple. Invariably, they can only be proposed in the light of detailed study and evaluation of the repertoire, context, and provenance of the instrument concerned. In the case of the chamber organs used in conjunction with consort music for stringed instruments in seventeenth century England, the bibliography of the recent book *John Jenkins and his Time*[1] reflects a sustained level of documentary research.

The original provenance of this instrument has been established: it was acquired by the LeStrange family of Hunstanton Hall, near Bury St. Edmunds with whom the foremost

[1] Andrew Ashbee, "The Transmission of Consort Music," in *John Jenkins and His Time: Studies in English Consort Music*, eds. Andrew Ashbee and Peter Holman (Oxford: Clarendon Press, 1996), 243-70.

composer of consort music, John Jenkins, was domiciled between 1644 and 1660. There are two lines of enquiry, which may elucidate the tuning system, or possibly systems, that have been applied to this instrument:

First, the instrument may contain archaeological evidence, particularly from the wooden pipework, where the insides of the bodies may reveal "witness marks" which might indicate the original positioning of the stoppers. The shanks of the stoppers themselves may be nicked or circumscribed. Were any of them at any time fixed? This evidence, if available, may also serve to give indications of pitch changes.

Second, evidence may be found in the music performed. Manuscripts made for the LeStrange family have survived. These may give significant insights into the harmonic structures and styles of the consorts in which this organ participated and therefore contain implications as to the likely system or systems of tuning that were in use.

This short chapter is limited to the second line of enquiry. None of the consort pieces known to have been performed at Hunstanton Hall was available in print. They only existed as manuscripts made expressly for particular patrons among whom they were circulated, as Andrew Ashbee notes:

> In general the transmission of consort music would have taken place on two levels. On the one hand, as Sir Nicholas Le Strange's manuscripts show, the aristocracy made available to others copies of the music in their own collection . . . and on the other the professional musicians themselves acted as couriers and copyists.[2]

When did Sir Nicholas LeStrange begin collecting manuscripts of consort music? Ashbee suggests that it was around 1630, but his two large documents of consort pieces grew over an extended period.[3]

One of these (GB LBl Add. Ms. 23779, pp. 2-65), contains John Coprario's Fantasia Suites-for One or Two Violins, Bass Viol and Organ, composed ca. 1622-26. They were copied for LeStrange, "sometime in the mid-1640s," partly in the hand of John Jenkins from John Woodington's part books (now Lbl, R.M. 24.k.3).[4] So LBl Add. Ms. 23779 is the very organ part which may have sat on the music rest of this instrument. These pieces are set in the home keys of g, d, a, e minors and C, G, D, and A majors. Ashbee notes the fact that "Le Strange seems to have been one of the earliest Englishmen to have arranged their music according to key."[5]

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[2] Ibid., 256.

[3] Ibid., 257.

[4] Christopher Field, "John Jenkins and the Cosmography of Harmony," in *John Jenkins and His Time*, 63-64.

[5] Ashbee, 247.

Tables 8.1a-b give overviews of the harmonic ambits of these pieces.[6] It shows the home key(s) of each suite and the modulations and transitions through related and distant keys. These are arranged in order of increasing distance from their tonics in the cycle of fifths. Major and minor keys are indicated by upper and lower case letters respectively.

TABLE 8.1A. John Coprario,Fantasia – Suites for Violin, Bass Viol and Organ

Suite No.	Home Key	Modulation and Transition Keys					
1.	g	B♭		F	d/D		
2.	g	B♭		F	c		
3.	G	D	e	A	B♭	E♭	F♯-B
4.	G	D	B	E	c	E♭	
5.	C	a	G	g			
6.	a	C	e	g			
7.	A	f♯	E	B			
8.	D	G	A	E			
9.	C	G	F	a/A	e/E	B♭	
10.	C	G	F	a/A	e/E		
11.	C	a	d/D	e/E			
12.	d	a/A	F				
13.	d	a/A	F	G			
14.	D	A	F♯-B				
15.	D	A	e/E				

TABLE 8.1B. John Coprario, Fantasia – Suites for Two Violins, Bass Viol and Organ

Suite No.	Home Key	Modulation and Transition Keys					
1.	C	F	d	G	a		
2.	C	G	a	d	E♭		
3.	C	G	E	B	a	d	F
4.	C	F	G	a	E♭		
5.	d	F	a				
6.	d	F	a	g			
7.	d	F	a	e/E	b/F♯-B		
8.	A	E	G	F			

The keys used in the Third of the Fantasia – Suites for one Violin, Bass Viol and Organ require a tuning system capable of accommodating enharmonic relationships. It has a remarkable interfacing of sharpwards and flatwards movements: in the Fantasia there is the succession of: G-A (bar 34) and B-e (bars 43-44), yet by bar 86, B♭-E♭ (there are no

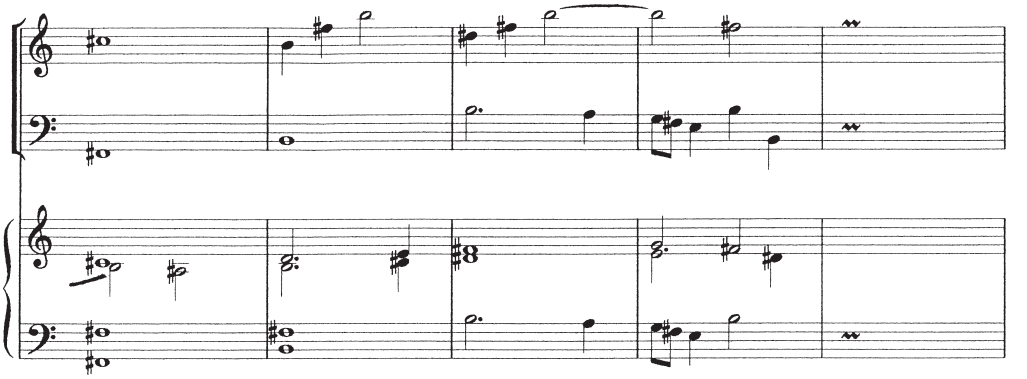
[6] Richard Charteris, trans. and ed., *John Coprario, Fantasia – Suites, in Musica Britannica*, 46 (London: Stainer and Bell, 1980).

A♭s—also only E♭ and G in the organ part—i.e., no B♭ in triad?) Similarly in the Almain there is a similar sharpwards swerve followed by a flatwards inflection: G-D (bar 7), and A-E (bars 16-7), then a full triad of F♯ as a dominant leading to B major in bars 22-23. This is followed by the B♭s of G minor in bars 25-26.

The Fourth Fantasia appears at first to be unremarkable: G-D-a, and then e in bars 62-63; but e minor is followed by a flatwards plunge to c minor in bars 64-65, and E♭ in bar 94ff. However, there are no A♭s in the key area of E♭, but there are G♯s in bars 90-91. The Almain of this Suite sets off on a sharpwards spiral: G-B major in the space of five bars. The second section (G-B-E-A) again gravitates to B by bar 16, but the movement ends in E major at bar 30.

The use of the key of A major in no.7 is uncommon in this repertoire[7] as is the transition through what we now identify as its relative minor (F♯ minor) in bar 24 of the Almain. The Fantasia and Galliard both traverse the keys of E and B (with A♯s present as the third of dominant triad of F♯). No.14 in D has similarly bold configurations in its Fantasia, with a B major cadence in bars 90-94. This is illustrated in ex. 8.1: note how the A♯s are not doubled by the strings whereas the D♯ is. Could this be significant?

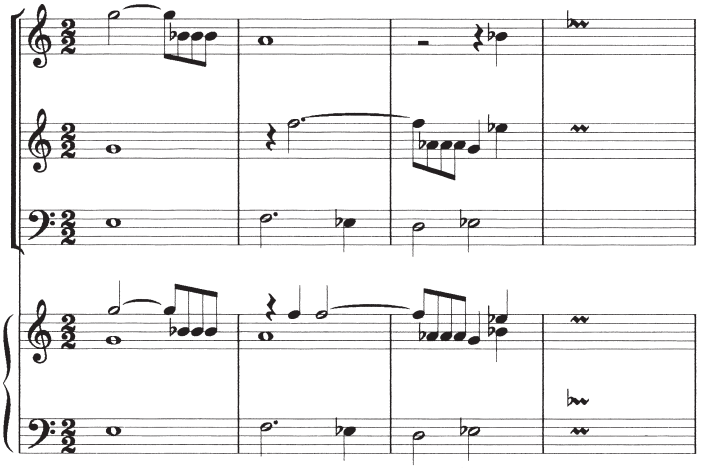
Ex. 8.1. John Coprario, Fantasia – Suite no. 14 in D for Violin, Bass Viol and Organ: Fantasia, meas. 90-93.



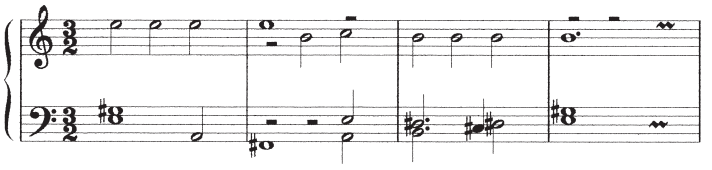
The coda of the Galliard of the Suite no. 2 in C for Two Violins, Bass Viol and Organ has an interesting "plagal" sequence into E♭, this time with A♭. It is interesting to consider whether the skeletal harmonic texture might have some bearing on the tuning, particularly with the A♭s. However, it may be significant in the Galliard of Suite no. 3 in C of this set, that the thirds of the E major and B major chords (bars 32-35) are more boldly scored than their enharmonic opposite numbers in ex. 8.2 (see ex. 8.3).

[7] Field, 62ff.

Ex. 8.2. John Coprario, Fantasia – Suite no. 2 for Two Violins, Bass Viol and Organ: Galliard, meas. 34-36.

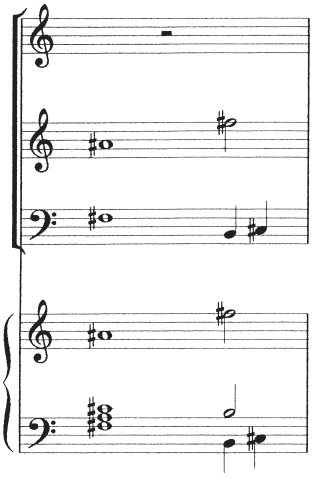


Ex. 8.3. Fantasia – Suite no. 3 for Two Violins, Bass Viol, and Organ: Galliard, meas. 32-35.



A point of interest from Suite no. 7 in d is a richly disposed F♯ major chord with a doubled third in bar 45 of the Galliard (ex. 8.4).

Ex. 8.4. Fantasia – Suite no. 7 for Two Violins, Bass Viol and Organ: Galliard, meas. 45.



The most significant enharmonic relationships within movements of the Coprario Fantasia – Suites may be summarized thus: D♯ v. E♭.

In the Third of the set for violin, bass viol and organ, the Fantasia, the perfect cadence of E minor (meas. 43-44) is followed by one in E♭ major in meas. 86: G♯ v. A♭.

In the Galliard of the Second of the set for two violins, bass viol and organ, we have the E♭s and A♭s, already mentioned in ex. 8.3, preceded by G♯s in meas. 14: A♯ v. B♭.

In the Almain of the same Suite a perfect cadence in B major in meas. 22-23 (with the doubled A♯s of its dominant in ex. 8.3) is followed by B♭s in meas. 25-26.

How do these pieces of Coprario compare harmonically and enharmonically with similar suites by John Jenkins himself? We will consider his Eight Suites for Two Violins or Treble Viols, Two Basses, and Organ.[8] The only complete manuscript source of these pieces is LBl, Add. Mss. 27550-54, a set of part books in several hands, including Stephen Bing and John Lilley,[9] copied in London in 1674[10] for the North family.[11] The organ part is not fully written out, but is a sporadically figured bass with a few melodic fragments in the tenor register. Table 8.2 gives an harmonic overview of these pieces.

TABLE 8.2. John Jenkins, Eight Suites for Two Violins or Treble Viols, Two Basses and Organ.

Suite No.	Home Key	Modulation and Transition Keys			
1.	g/G	D	F	f	b♭
2.	a/A	E	e	c♯	
3.	d/D	B♭			
4.	F	C	f	B♭	
5.	B♭	E♭	c	f	d
6.	F	C	B♭	b♭	E♭
7.	e/E	B	b	f♯	C♯
8.	D	A	b	f♯	

The enharmonic tuning implications are therefore: C♯/D♭, G♯/A♭, D♭/C♯, G♭/F♯, D♯/E♭, E♯/F, A♯/B♭, B♯/C. The only keys not used are: F♯ major, and g♯ and d♯ minors.

Jenkins's chromaticism can be seen as a part of a Renaissance tradition of circumnavigating the complete cycle of fifths (see Christopher Field's essay "Jenkins and the Cosmography of Harmony"[12]). Pieces of this kind, which require a very flexible system of tuning, perhaps

[8] Andrew Ashbee, trans. ad ed., *John Jenkins, Consort Music of Four Parts*, in Musica Britannica, 24 (London: Stainer and Bell, 1969).

[9] Field, 72-73.

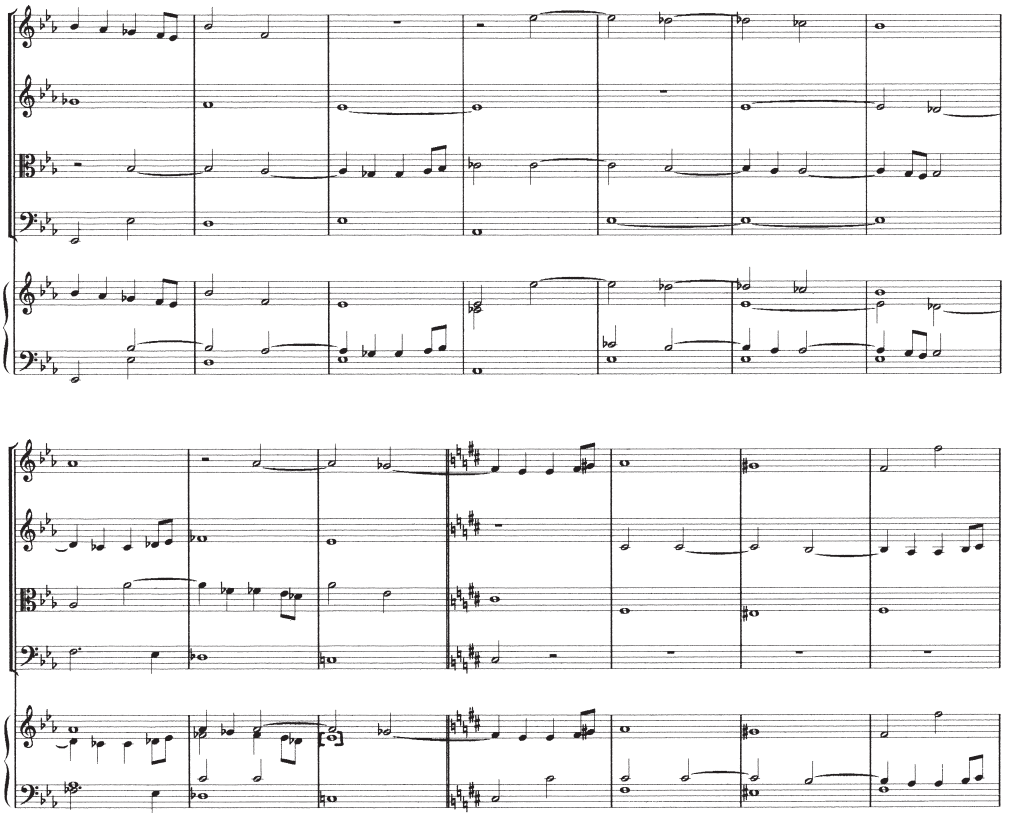
[10] Robert Thompson, "Some Late Sources of Music by John Jenkins," in *John Jenkins and His Time*, 281.

[11] Jonathan Wainwright, "The Christ Church Consort Manuscripts," in ibid., 238.

[12] In *John Jenkins and His Time*, 1-74.

approaching equal temperament, if not actually within it, pose no problem to viols with appropriate fret settings. As Field notes: "A question which continues to interest performers and scholars is how it was possible to combine viols with chamber organ in this music without the instruments sounding unacceptably out of tune."[13] One particular instance of this is the chromatic axis of Jenkins's Fantasia No.7 in C minor (ex. 8.5).[14]

Ex. 8.5. John Jenkins, Fantasia No. 7 in C minor, meas. 60-74.



Margaret Crum[15] suggests that the part books (GB:Ob, Ms. Mus. Sch.C.99) of this work were copied under the composer's supervision for the Dudley household at Kirtling Hall, Cambridgeshire, around 1654. Field also draws attention to a manuscript of the chromatic Hexachord Fantasia for viols and organ by Ferrabosco II (Mss. GB: Och,

[13] Ibid., 42-43.

[14] For the complete composition, see Musica Britannica, 24, no. 41.

[15] "The Consort Music from Kirtling Brought for the Oxford Music School from Anthony Wood, 1667," *Chelys* 4 (1972): 3-10.

Mus.436 & Mus. 397-400 and 403-408) which is associated with the Hatton family at Kirby Hall in Northamptonshire.

If the chamber organs at Kirtling and Hatton Halls were to "softly accord to all" in these pieces then equal temperament tuning would appear to have been required.

This harmonic evidence from the Fantasia-Suites of Coprario and Jenkins would indicate that equal temperament might also have been used for the present organ when played by Jenkins for the LeStrange family at Hunstanton Hall. However, in relation to Jenkins' massive output of some eight hundred surviving works, such intensive chromaticisms appear exceptional. In view of this it is pertinent to compare such harmonic sophistication with the less adventurous norms for the period amongst composers of consort music. For this purpose we will consider the music of Richard Mico (ca. 1590-1661), who was an organist and tended to write idiomatically for the instrument in his consorts.[16]

In his Fantasias for Three Viols with Organ, Mico admits the keys of d/D, g/G, a/A, F, C, and B♭. In c minor contexts he avoids A♭; but when writing for viols alone, he also employs the keys of E♭, A♭, C♯, F♯ and B majors. These are the very keys that are unserviceable in quarter-comma meantone tuning,[17] the system that would appear to suit much of the English solo keyboard repertoire of the early seventeenth century.

Harmonically adventurous pieces are also rare in the solo repertoire of the early seventeenth century: well-known examples being John Bull's chromatic *Hexachord* Fantasia,[18] and Nicholas Carleton's *A Verse of Four Parts*.[19] The Bull Fantasia has been related to instruments tuned in "extended meantone" with nineteen notes or more to the octave, made available either through split keys or two manuals.[20] Bull's Fantasia is built on a sequence of hexachord entries in upward steps a tone apart, with a central enharmonic axis. Carleton's *Verse*, without a cantus firmus, has a more tonal harmonic structure which is summarized in table 8.3.

In column one there is a sharpwards climb though minor modes of the cycle of fifths from c to g♯ (c♯ is implied modally without its leading note). A descent is evident in column two through the major modes from B to C, then, in column three, the remaining plagal major keys are traversed. The inverted tonic pedal of the "coda" restores tonal equilibrium after the chromatic excursions. There are no enharmonic pivots and only in meas. 82 (ex. 8.6) is there untidiness and some barely concealed consecutive fifths.

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[16] Andrew Hanley, trans. and ed., *Richard Mico, Consort Music*, Musica Britannica, 65 (London: Stainer and Bell, 1994), xxi.

[17] Charles A. Padgham, *The Well-Tempered Organ* (Oxford: Positif, 1986), 54.

[18] Field, 22-24, 27-28.

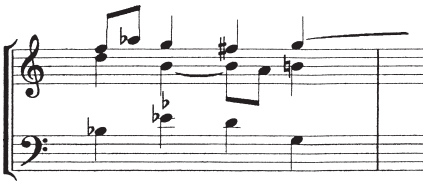
[19] John Steele, Francis Cameron, and Thurston Dart, eds., *John Bull, Keyboard Music: I*, Musica Britannica, 14, 2nd rev. ed. (London: Stainer and Bell, 1967), 53-55.

[20] *[8] Pieces from the Tomkins Manuscript*, ed. Frank Dawes, *Schott's Anthology of Early Keyboard Music: English Virginalists* (London, 1951), 9-13.

TABLE 8.3. Nicholas Carleton, *A Verse of Four Parts*.

Meas. nos.	Key(s)	Meas. nos.	Key(s)	Meas. nos.	Key(s)
1-7	c	52-53	B	72-74	g/G
8-22	g d	54-55	E	77-78	E♭
22-24	a	56-57	A	78-79	A♭/D♭
28-30	d	58-59	f♯/F♯	80-81	B♭
31-33	a	60-61	A	82-83	E♭-c
34-37	e	62-63	D	94-95	f
38-39	b	66-67	b	92-105	c/C
40-41	f♯/F♯	69-70	G		
44	g♯	70-71	C		
47	f♯				

EX. 8.6. Nicholas Carleton, *A Verse of Four Parts*, meas. 82.



Whether this piece was originally a keyboard solo or a transcription of a viol consort doesn't matter, since it only serves to suggest that the seeds of plurality in organ tuning systems in England commented upon by Benjamin Flight in 1819[21] may have been a reality some 200 years earlier. To conclude, it would seem premature if not simplistic in the light of the present evidence (which may in any case be corroborated or refuted by any archaeological findings from an examination of the pipework of the Historic St. Luke's organ), to suggest only that this repertoire would imply the existence of irregular systems of meantone temperament of considerable versatility if the organ was to be heard: "Softly, and Sweetly Acchording to All."

[21] Benjamin Flight, *Flight's Practical Tuned for the Organ or Pianoforte* (London, 1819): "tuning by unequal temperament is used for Church Organs . . . Pianofortes and Organs, used for the Concert-room, are tuned by equal temperament . . . ," cited by Christopher Kent, in "Tuning and Temperament and the British Organ, 1750-1850: A Century of Change viewed through the Repertoire," *Journal of the British Institute of Organ Studies* 14 (1990): 21-34.

9

The Chamber Organ in Stuart England: The Background to the Historic St. Luke's Organ

Dominic Gwynn

In his "Notes of Me," written around 1695, Roger North describes the music in the houses of his grandfather, Dudley, 3rd Lord North, in the period before the civil wars, "to shew how a retired old fantastik courtier could entertein himself."[1]

> he play'd on that antiquated instrument called the treble viol, now abrogated wholly by the use of the violin; and not onely his eldest son, my father . . . , play'd, but his eldest son Charles, and yonger son the Lord Keeper, most exquisitely and judiciously. And he kept an organist in the house, which was seldome without a profes't musick master. And the servants of parade, as gentleman ushers, and the steward, and clerck of the kitchen also play'd; which with the yong ladys my sisters singing, made a society of musick, such as was well esteemed in those times. And the course of the family was to have solemne musick 3 days in the week, and often every day, as masters supply'd noveltys for the enterteinement of the old lord. And on Sunday night, voices to the organ were a constant practise, and at other times symphonys intermixt with the instruments.

North extols the "country enterteinement," with consorts "usually all viols to the organ or harpsichord. . . . When the hands were well supply'd, then a whole chest went to work, that is 6 violls, musick being formed for it; which would seem a strange sort of musick now, being an interwoven hum-drum, compared with the brisk battuta [or beat] derived from the French and Italian." The old viol Fancies had "a strange tranquill harmony in them—nothing of hurry, but as a temperate air flowing and the battuta scarce discernible, and keeping time just needful to keep the performers together," which "will let one sleep or drouse in the hearing of it." He contrasts this with the "now-reigning humour, of running to London . . . where heads are brisk and airey hunting of enterteinements," etc.

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[1] *Roger North on Music*, ed. John Wilson (London: Novello, 1959). "Notes of Me" is a manuscript autobiography quoted in extracts in *Roger North on Music*.

This chapter is about the organs used for such musical entertainment, in the decades before and after an organ was bought for the delight of the LeStranges at Hunstanton Hall, in 1630. Until recently, the history of these organs was obscure, and their attribution and purpose was mistaken. But the organs themselves are now being examined more closely, which has helped to classify them and reveal their essential characteristics.[2] Their musical purpose and social context are being illuminated by research into the aristocratic musical patronage of the late sixteenth and early seventeenth centuries, especially by those interested in the rich seams of English viol consort music and domestic devotional activity.[3] Much of this research has yet to filter through to organ historians, who remain obstinately insular in their interests.

The myths associated with these organs—and the Hunstanton Hall organ is no exception—started early. They are neatly encapsulated in this reference—a footnote to the 1862 edition of the correspondence of that indefatigable champion of Handel, Mrs. Delaney (Mary Granville)—concerning her brother's manuscript collection of Handel's music assembled during the 1740s:[4]

> Mr Granville had also an organ built under Handel's supervision, by Father Smith, which is still in the family, as well as the MS. music, and amongst old papers of Mr Granville's was the following memorandum, probably given by Handel for Mr Granville's information—"Father Smith's chamber organs generally consist of a stop diapason of all wood. Sometimes there is an open diapason of wood. Down to Cesaut [*sic*], an open flute of wood, a fifteenth of wood, a bass mixture of wood; that is to middle C. of two ranks, the cornet of wood of two ranks to meet the mixture in the middle. Sometimes the mixture

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[2] See Martin Goetze and Dominic Gwynn, Harley monographs on Canons Ashby in Northants, St. George's Nottingham, and Staunton Harold in Leicestershire, and workshop reports on other organs, including the Dean Bargrave organ at Canterbury, Compton Wynyates Hall in Warwickshire, N.P. Mander's workshop in East London, the Galpin organ at Canterbury Cathedral, Thornton in Lincolnshire, the Royal College of Music Museum, Belchamp Walter Hall in Essex and Wollaton Hall in Nottingham; Dominic Gwynn, "The Sound of the Seventeenth-century English Chamber Organ," *Chelys* 125 (1996-97); Barbara Owen (on the Smithfield organ), "A 'Payer of Organs' and a 'Voyal'," *The Tracker* 41, no. 2 (1997); Martin Renshaw (on the Knole organ), "An Early 17th century British Organ," *BIOS Journal of the British Institute of Organ Studies* 4 (1980); James Collier, Harley monographs on the remains of 1629 Dean Bargrave organ in Canterbury Cathedral Library, and the remains of the 1643 Christian Smith organ at N.P.Mander Ltd; James Collier, "Dean Bargrave's organ at Canterbury," in ibid., 21 (1997).

[3] In particular by Andrew Ashbee, Lynn Hulse (see forthcoming article in *BIOS Journal*), Jonathan Wainwright, and Peter Holman.

[4] *The Autobiography and Correspondence of Mary Granville, Mrs Delaney*, ed. Lady Llanover, series 2 (London, 1861-62), vol. 1, p. 568, note.

> is of mettle, as is the cornet. N.B.—If it is stiled 'a furniture' it is not one of his, that is, if the mixture is stil'd so it is not. Remark that all the wooden pipes are of clean yallow deal."

Even though this was recent history for the 1740s, Smith and Handel are being associated in a way beloved of English church guide books. Unfortunately, Father Smith died ten years before Handel came to England. Handel was connected with organs made by Father Smith's nephew Gerard, for they would have known each other, and organs in this style were still being made and sold in the early years of the eighteenth century.

However, the association with Father Smith is more complicated than originally thought. He could not have originated the style, or made all of them, for these chamber organs were being made before he came to England in 1665, and he would not have known anything like them before he came, either in North Germany or in Holland. Even so, the tradition is so tenacious that most of these organs appear in the books about Father Smith by Andrew Freeman in 1926 and John Rowntree in 1977. There is a connection with Germanic builders, for some of the organs have note marks on the pipes and in the chest which are characteristic of Northern Europe. Smith employees were making chamber organs in the early years of the eighteenth century. Gerard Smith, or someone like him, may have rebuilt the chamber organ at Staunton Harold in 1686, and made the chamber organ at Wollaton Hall in about 1700. But in the elaborate organ at Compton Wynyates (and therefore the organs at Canons Ashby, Manders, and Canterbury, which were made by the same workman) "Are Cart" has been scribed on the foot of AA of the Fifteenth, suggesting a maker of French extraction. Of the twenty organs in table 9.1, only three or four could have had associations with the Smith workshop.

The stops listed in the memorandum were common to chamber organs of the seventeenth century, not to mention the eighteenth. The earliest surviving English organ is the chest organ at Knole in Kent, which dates from the first decade of the seventeenth century. With its oak pipes, it may be representative of an older part of the tradition, but it is otherwise similar to the later organs. The latest organs with narrow scaled stopped and open wood pipes are those at Forde Abbey, where there is a chamber organ of 1759, whose original pipes are almost indistinguishable from seventeenth century examples. Also at Merton College, Oxford there is a chamber organ of about 1760 by Thomas Parker, again with traditional open and stopped wooden pipes. This was a mainstream tradition, no doubt pursued by all the organ building workshops of the times in which they were made.

Although it is quite easy to dispose of the existing traditions, it is nevertheless difficult to find others to put in their place. One problem is the difficulty of tracing the provenance of most of these organs. Another is their uniformity of style and manufacture, which makes it difficult to trace developments from archaeological evidence. We are left with informed guesswork.

TABLE 9.1. Comparison of Stop Lists.

		STOP LISTS						
Organ	Date	Stop Diap	Open Diap	Prin	Flute	12th	15th	Mix
Knole	ca. 1606	X		X		X	X	
Dean Bargrave	1629	X		X		X	X	
Hunstanton Hall	1630	X b/tr	X	X b/tr			X b/tr	
Staunton Harold	1630s	X	X tr	X		X	X	
Christian Smith	1643	X	X tr	X		X	X	
Worcester Cathedral	1663	?	?	?			?	
Compton Wynyates		X	X tr	X	X m		X m	X m
Canons Ashby		X		X			X b/tr	X b/tr
Mander		X		X			X m	X m?
Canterbury Cathedral		X		X			X	X b/tr
Hounslow Heath		X		X		X b/tr	X b/tr	X b/tr
St. George Nottingham		X		X			X	X tr
Staunton Harold rebuild	1686	X	X tr	X	X	X	X	
Granville's memo		X	X tr	X			X	X b/tr
Dingestow		X	X tr	X		X	X	X b/tr
Russell Collection		X b/tr		X b/tr			X	X tr?
Thornton (Lincs)	?	X	X tr	X			X	X ?
RCM museum	1702?	X	X tr	X			X b	X tr
Guy Oldham		X	X tr m	X			?	?
Belchamp Walter		X		X				X m
Wollaton Hall	ca. 1700	X		X m	X	X m	X m	X m

There were many chamber organs in seventeenth-century England. The tables include twenty fairly complete and reliable examples. Another ten could have been included which are less well-preserved or authenticated. Remains, ranging from organs with casework and wind chest, to no more than a rank or two of pipes, survive from at least twenty-five others. Compared to the dearth of contemporary chamber organs in France or Holland, the number is remarkable. As there are also many contemporary references in household accounts and memoirs, it is clear that they were part of a flourishing musical culture.

This culture was partly recreational, but in the Puritan century from 1560 to 1660, it must have been primarily devotional. This period saw the loss of church organs, partly because of the loss of the screens and the context in which they were used, partly because of the enthusiastic despoiling of the traditional church, and partly because of a horror of popish superstition. No doubt a number of organs remained in silence, but by the late sixteenth century, by which time rood screens, altars, vestments, and images had already been systematically removed from parish churches, most church organs must have been demolished or unused. The musical Puritan, as well as the committed musical Catholic,

resorted to domestic music-making. For the Puritan, there was no contradiction; the godly house was as important a part of right living as church attendance, but the activities in God's House were restricted to the exposition of His Word. These chamber organs can be seen as a part of Puritan culture as much as Roman or Laudian.

One can imagine that there was no shortage of skilled organ builders. All we can tell for certain is that many of the people who made chamber organs in the late sixteenth and early seventeenth centuries did not have names known to us as church organ builders. The impression is of a vernacular, and now largely anonymous, trade of conservative craftsmen, absorbed in the later seventeenth century by the larger workshops, which acted as agents. By that stage, much of the buying would have been done in London, where almost all the workshops were, thanks to the "now-reigning humour, of running to London." Hence the connection with Father Smith.

These organs were of a uniform, largely vernacular, style. It is quite difficult to date them from internal evidence, for there are very few progressive developments, though there are some clues, which will no doubt be added to as research continues. The organs dating from before the Restoration might have a Twelfth, whereas the organs built after the Restoration might have a mixture. Most of the surviving organs from before the Restoration have at least a treble Open Diapason, and the Historic St. Luke's organ has a full compass Open, using the Stop Diapason and Principal combined for the bottom octave. The pitch tends to be close to modern pitch for the earlier organs, higher after the Restoration, and lower for the later ones. The compass tends to expand through the century, though the Historic St. Luke's compass of forty-nine notes remained common into the eighteenth century.

The connection with movements of fashion in metropolitan culture is perhaps more obvious in the structure of the case and the decoration of the pipe front. The cases at Staunton Harold and Lichfield still have a mediaeval corner post construction. The cases of the Historic St. Luke's organ and the four organs by the Compton Wynyates builder are made with paneled frames, butt-jointed at the corners to make boxes. The later seventeenth-century organs are made with two boxes, the lower for the bellows, and the upper for the wind chest, mechanism and pipes. The moldings for the plinth, impost, and entablature are attached to the boxes, whereas in eighteenth-century chamber organs they would be attached to separate carcasses, holding the loose panels of upper and lower case in place. The Russell Collection organ (Edinburgh) does have a dovetailed box to support the entablature moldings, as well as the flat, eighteenth-century consort pitch indicating a later date. Surprisingly, the 1629 Dean Bargrave organ has the sides dovetailed to the floor and a dovetailed carcass for the entablature on top. At this period, dovetail joints are usually attributed to immigrant continental craftsman, though these might confirm its London provenance.

It is unfortunately impossible to say what the earliest style of front looked like, though the smallest organs would have had simple mitre-shaped pipe fronts. This we know from the earliest surviving representations: the memorial tablets to Matthew Godwin at Exeter and to Sir Thomas Bodley at Merton College, Oxford. Historic St. Luke's and the Christian

Smith organ (fig. 9.1) have perspective fronts, which would have been considered sophisticated in the 1620s and 1630s. The general idea was incorporated into later fronts, like those at Canons Ashby and N.P. Mander, Ltd. The Compton Wynyates organ has an elaborate pipe front (fig. 9.2), reflecting the organ's design as a miniature church organ. The case front now incorporated into the Mander organ at Jesus College Cambridge must have advertised a similar purpose.

These organs have fine carving from the native school before Grinling Gibbons. Rather more up-to-date is the carving on the Hounslow Heath organ, though it is com-bined with a perspective style of front, consisting of painted dummy wooden pipes. Painted and decorated pipes remained popular throughout the century, though the arabesque decoration becomes more sophisticated; at Belchamp Walter the dummy pipes have a gilded ground like the 1704 Father Smith organ at Finedon. The organs belonging to Guy Oldham and Wollaton Hall have the only front pipes surviving in old English organs which have patterns incised in the metal in the German fashion. The organ cases at St George in the Meadows in Nottingham, and at the Royal College of Music in London (1702?) have dummy front pipes that are gilded—a decorative feature which was to become common in the eighteenth century.

After the Restoration in 1660, all the surviving chamber organs are laid out in the same way, with the bellows in the lower case, and the rest of the organ in the upper case. The variety was greater in the earlier organs. Matthew Godwin's organ stood on a table with the bellows behind, feeding straight into the back of the chest. The 1630 organ at Blair Athol, which apparently does not look English, is of this type, the commonest in the rest of Europe at this time. The Knole organ is England's sole surviving historic box organ, with the bellows under the chest in the base of the organ, and long stickers under the keys resting on the pallets. There are the three surviving table organs, the Dean Bargrave, the Historic St. Luke's organ and the Christian Smith, which all have, or had, a permanent open stand, and the bellows in the roof. The organs at Lichfield and Staunton Harold were conventional chamber organs, the type which all the surviving chamber organs from after the Restoration follow.

The keys never extend more than an inch behind the covered part, with a parchment hinge held on a rail, and a leathered bed which also serves as a register for the stickers on which the keys rest. The chest is therefore more or less as wide as the keyboard, though the short stickers can splay out at an alarming angle to allow more room in the bass. At Historic St. Luke's, Canons Ashby (fig. 9.3), and Compton Wynyates bass pipes are grooved to the treble end of each upper board. At St George's Nottingham there is a tiny rollerboard.

The chest design seems to date from a time when organs had a chest near the keys, and conduits leading to toe boards. Classical Iberian organs have this system, sometimes to excess, and it is illustrated in Salomon de Caus's *La Raison des Forces Mouvantes*, published in Heidelberg in 1616, but assembled during his stay in England. The Theeuws claviorgan in the Victoria & Albert Museum, made by an immigrant from Antwerp in 1579, also has a

FIG. 9.1. *The decorative pipe front of the 1643 chamber organ by Christian Smith at N.P. Mander, Ltd. with a perspective front of speaking wooden pipes, and a cornet and a sackbut player on the tiled pavement*

FIG. 9.2. *The chamber organ of about 1675 at Compton Wynyates House in Warwickshire, conceived as a miniature church organ*

FIG. 9.3. *The chamber organ probably made for Cheshunt Great House in Hertfordshire in around 1675, now the property of the National Trust at Canons Ashby, with a front of speaking wooden pipes shaped like metal pipes*

small chest, with large grooved upper boards attached to the back and top surfaces, each overlapping the one below. The Dean Bargrave has the same system, with two upper boards against the back of the chest, the lower leading to the larger rank at the back, the next overlapping it leading to the next rank in front of it, and the next two ranks on the upper board resting on top of the chest behind the keys, also overlapping the upper board underneath. Historic St. Luke's has three upper boards against the back of the chest, two for Stop Diapason and Open Flute, and one for the Fifteenth, and the Principal (which is in the front) on top. Staunton Harold had a conventional chest, as deep as the case, with all the upper boards on top, but the organs at Canons Ashby and Compton Wynyates still use the older style. The grooving connecting the slider hole to the upper board hole is astonishing in all these organs.

The sliders are usually controlled with iron rollers, which emerge as shaped levers next to the keys. The sliders in the Historic St. Luke's and Staunton Harold organs are controlled with knobs attached to the ends of the sliders, emerging through the side of the case. This is an older system, surviving from the mediaeval organ (e.g., Old Radnor in Powys, ca. 1540).

In all the original organs, the bellows have been replaced, though traces of pedal pivot points, brackets, and holes survive. The bellows in the later organs would have consisted of a multifold reservoir with feeder, probably activated by a belt through the treble side of the lower case, and perhaps with a pedal as well. The mid-eighteenth-century bellows in the Galpin organ at Canterbury are of this type. In the early organs, wind was provided by two gravity-fed bellows feeding into the back of the chest, raised alternately. In Matthew Godwin's organ these would have been behind the organ. In the Dean Bargrave organ, the bottom boards of the bellows survive, with their inlet holes, in the roof of the organ.

The list in table 9.1 (see p. 108) is in a tentative chronological order, based on these and other indicators. It gives the simple stop lists in tabular form. It looks as if there is more likely to be a Twelfth in the earlier organs, and a mixture in the later organs. Divided and treble stops are a feature of the later organs (apart from the Historic St. Luke's organ). Open Diapason trebles are commoner amongst the earlier and later organs. The few stopped flutes only appear in later organs. It is difficult to generalize from this evidence, but the importance of the Open Diapason in accompanying viols, and the tendency of later organs to imitate the church organs of the period, with a few of their imitative stops, could be inferred (see table 9.1, p. 108).

It is also noticeable that there are no metal pipes in the organs which can be dated from before the Restoration. These earlier organs can be seen as part of a tradition that was already an established tradition in the early sixteenth century. Organs with choruses of wooden pipes are mentioned in an inventory at Christ's College, Cambridge in 1509, and at Durham Cathedral before the Reformation, where the exquisite organ "only opened and played upon at principal feasts" had "the pipes . . . all made of most fine wood." English wooden pipes are made and voiced in a fashion unlike any other in the organ building

traditions. They resemble metal pipes made in wood, in that the block, with its beveled top edge projects above the lower lip of the cap as if it were a languid bevel, and the flue is in the cap rather than the block. The front pipes at Canons Ashby have rounded front walls and shaped feet so that they resemble metal pipes. Moreover, the scales of wooden pipes can follow metal pipe scales in the same organ. In the church organs of Father Smith the metal and wooden pipes have the same inner circumference, and the mouth width is identical. Such comparisons cannot be made in these chamber organs, but it is not impossible that the mouth widths have been calculated using the geometry of a circle rather than a simple arithmetical proportion.

The sound is soft and delicate (table 9.2). The scales are very narrow (table 9.3). In the Christian Smith organ, and at Canons Ashby, they are as narrow as they can possibly be, so much so, that tuning can attract the lower octave to overblow to the upper. This produces a rich stringy sound. To control it, the manufacture and the voicing have to be very exact, with the side walls perfectly parallel, the front wall perfectly in line with the block, the flue widths and the thickness of the upper lips exact, and the toe-holes plugged to the correct proportion. It is not sufficient to reduce the volume by plugging the toe-holes, they also have to be in correct proportion to the flue area (figs. 9.4-9.5).

TABLE 9.2. Comparison of key compass and pitch.

KEY COMPASS AND PITCH					
Organ	Date	No. of Notes	Compass	b/tr Division Treble Stop	Pitch
Knole	ca. 1606	45	C/E-c^3		+ 1/2 HT
Dean Bargrave	1629	46	C-a^2	b/c^1	
Hunstanton Hall	1630	49	C AA D-c^3	b/c^1	- 1/2 HT
Staunton Harold	1630s	50	GG C AA D-c^3	$c^{\#1}$	+ 1 HT
Christian Smith	1643	49	C AA D-c^3	$c^1/c^{\#1}$	+ 1/2 HT
Worcester Cathedral	1663	?			
Compton Wynyates		49	C AA D-c^3		+ 1 1/2 HT
Canons Ashby		49	C AA D-c^3	$c^1/c^{\#1}$	+ 1/2 HT
Mander		49	C AA D-c^3		
Canterbury Cathedral		49	C AA D-c^3	$c^1/c^{\#1}$	+ 2 HT
Hounslow Heath		48	C D-c^3		
St. George Nottingham		49	C AA D-c^3	$c^{\#1}$	+ 1 1/2 HT
Russell Collection		51	C AA D-d^3	$c^1/c^{\#1}$	- 1/2 HT
Dingestow		?			
Russell Collection		51	C AA D-d^3	$c^1/c^{\#1}$	- 1/2 HT
Thornton (Lincs)	?	51	C AA D-d^3		
RCM museum	1702?	49	C AA D-c^3	$c^1/c^{\#1}$	+ 2 HT
Guy Oldham		50	GG C AA D-c^3		
Belchamp Walter		49	C AA D-c^3	$c^1/c^{\#1}$	+ 1/2 HT
Wollaton Hall	ca. 1700	?	C AA D-?		+ 1/4 HT

TABLE 9.3. Comparative pipe scales

COMPARING 17TH WITH 18TH CENTURY CHAMBER ORGAN SCALES

Stop Diapason circumferences (twice width x depth)

Organ	Hunstanton Hall 1630	Christian Smith 1643	Kedleston Hall ca. 1740	Russell Collection ca. 1760
C	303.4	301.2	386.6	340
c^{o}	167	175.4	210	215
c^{1}	104	96.6	125	129
c^{2}	54*	59.4	77.6	78
c^{3}	32*	28	50	51

*C18 pipes

COMPARING 17TH CENTURY CHAMBER ORGAN SCALES

Open wood pipe circumferences (twice width x depth)

Organ	Hunstanton Hall 1630	Staunton Harold ca. 1630	Christian Smith 1643	Canons Ashby ca. 1675	St. George Nottingham ca. 1675
pitch	Prin $g^{\#}$	Prin $g^{\#}$	Prin $g^{\#}$	Prin g	Prin g
4′ G	125.2	157.2	138.2	116.6	147.4
g^{o}	73.2	85.8	70.6 (Op)	63.0	75.2
g^{1}	41.8	56.6	41.4 (Op)	37.2	41.0
g^{2}	26.8 (15th)	37.0	28.2	23.0	35.2

Open wood pipe mouth widths/circumferences

4′ G	1/4.38	1/4.7	1/4.72	1/4.18	1/4.54
g^{o}	1/4.46	1/5.14	1/4.33	1/4.44	1/4.82
g^{1}	1/4.5	1/5.15	1/4.5	1/4.23	1/4.51
g^{2}	1/4.32*	1/5.29	1/4.48	1/4.18	1/4.51

*$a^{\#2}$ 1/4.36

Open wood pipe mouth heights/widths

4′ G	1/4.61	1/3.63	1/4.19	1/4.04	1/3.32
g^{o}	1/5.12	1/3.8	1/3	1/3.16	1/2.26
g^{1}	1/4.43	1/3.21	1/2.88	1/3.26	1/2.07
g^{2}	1/2.82*	1/2.69	1/4.5	1/2.11	1/2.17

*$a^{\#2}$ 1/4.66

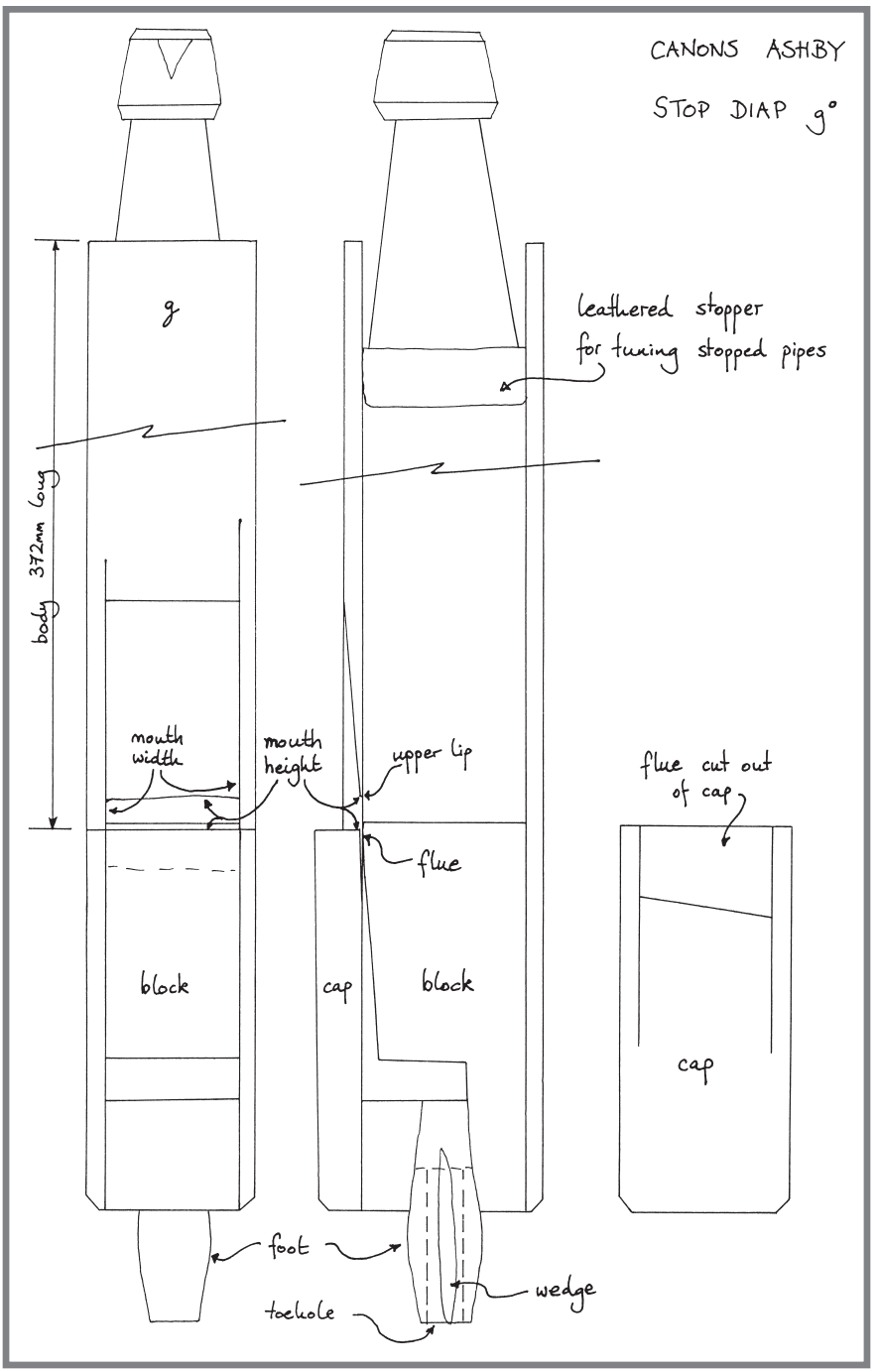


FIG. 9.4. *Diagram of Stop Diapason g° in the organ at Canons Ashby, made of pine, with oak block, cap and stopper, showing the flue in the block and the cap, the narrowness of the scale and the thinness of the upper lip*

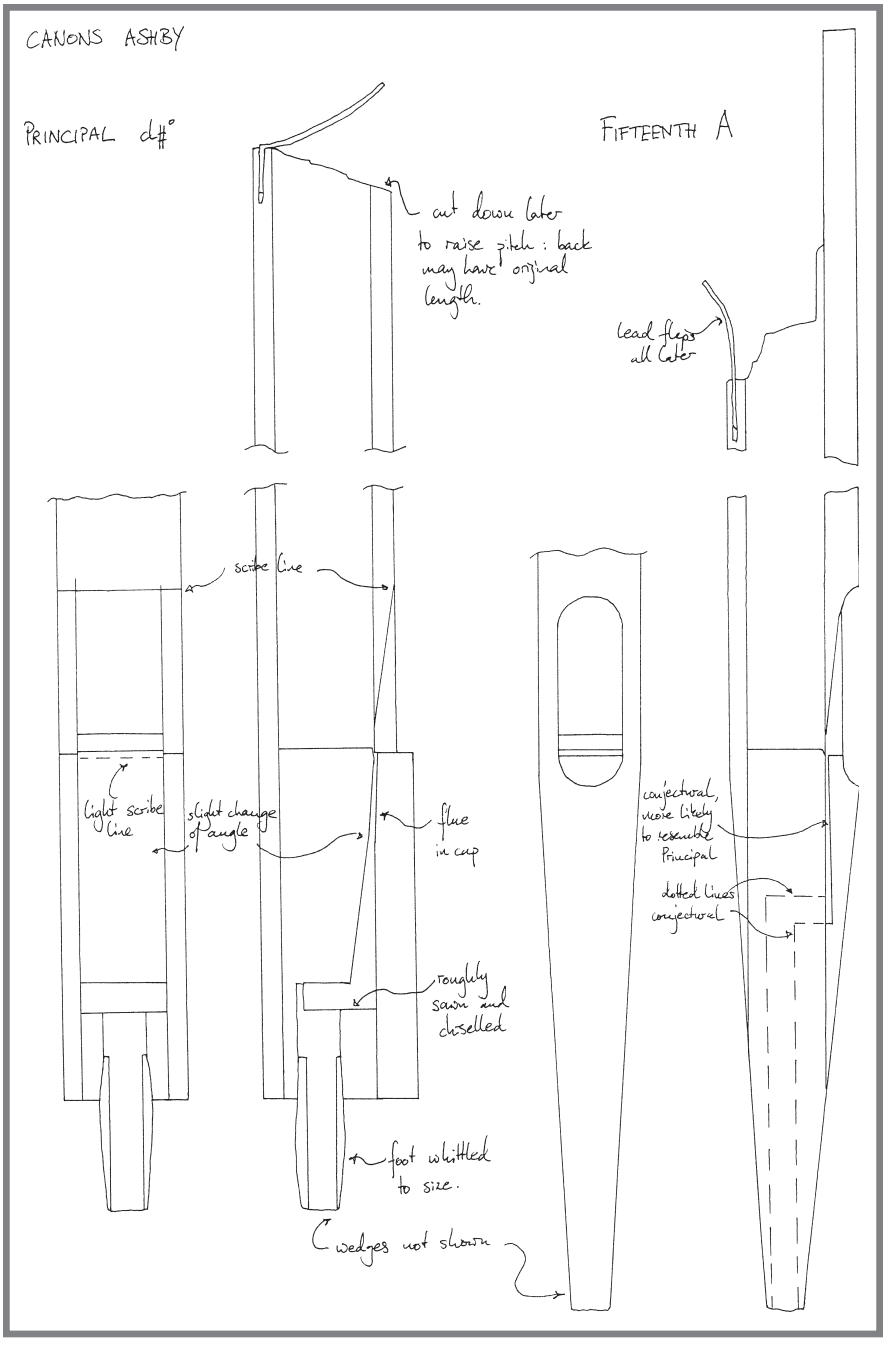


FIG. 9.5. *Diagram of the Principal d#° and the Fifteenth A in the organ at Canons Ashby, showing the way the latter is rounded to resemble a metal pipe. The pipes have been reduced in height and the tuning flaps are probably later, but give a pitch close to the original length*

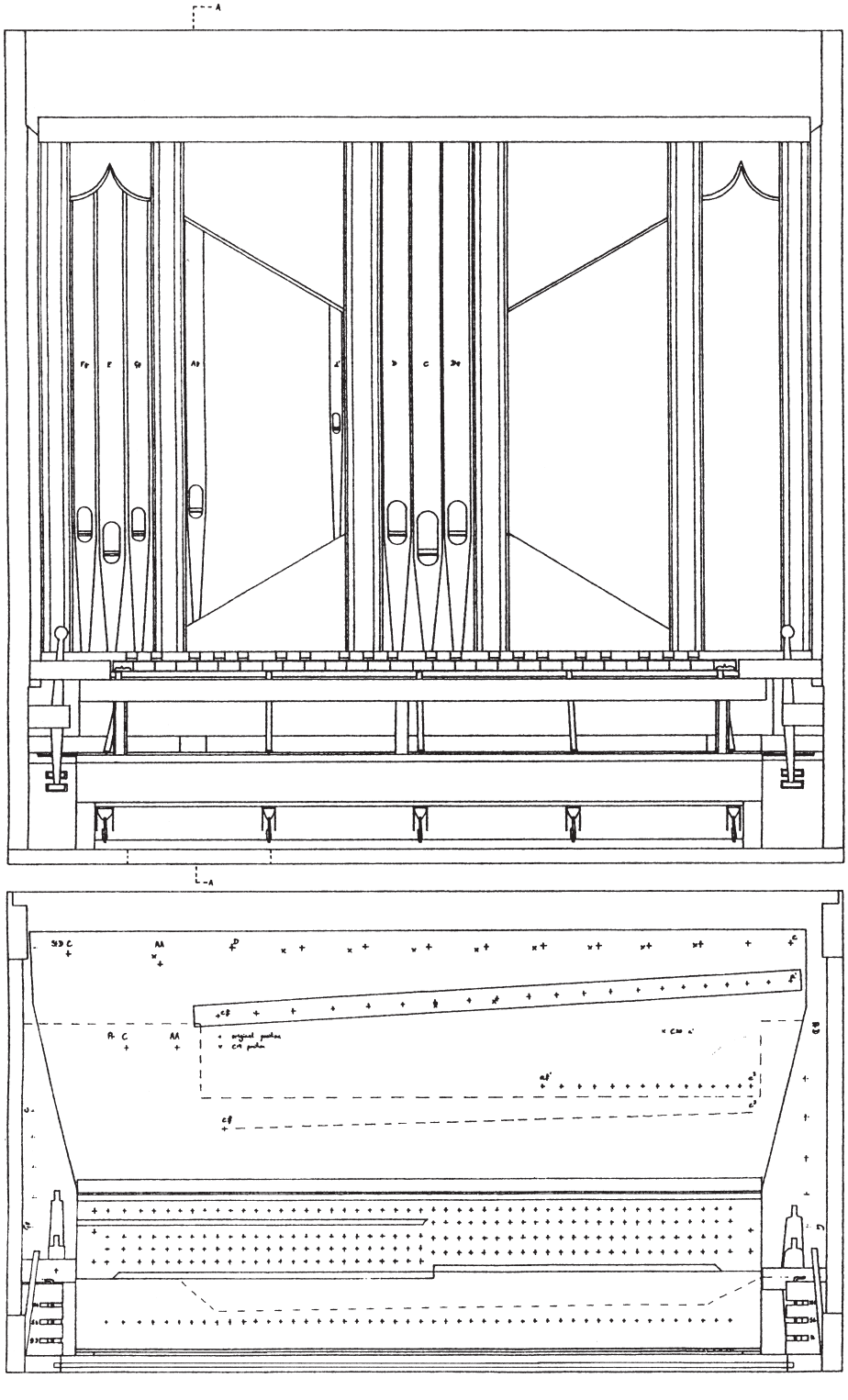
By comparison, the height of the cap below the top edge of the block can seem a bit haphazard, which is odd. It makes little difference to the direction of the wind stream, but it does affect the mouth height, which is measured to the cap (in a metal pipe, the lower lip). The bevel on the top edge of the block can also seem a bit haphazard, but seems to be the variable, and therefore the last part of the voicing, compensating for misalignment of the front wall and the cap.

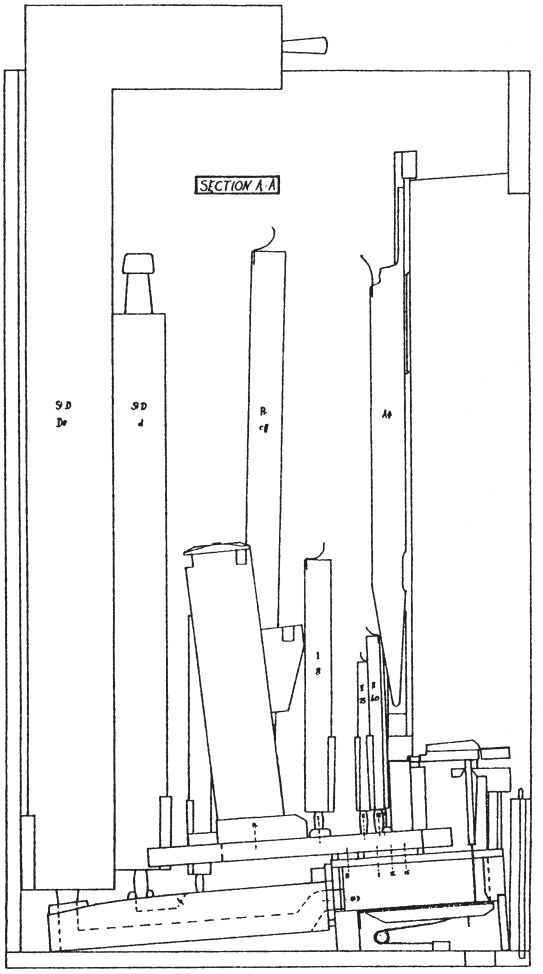
The direction of the wind stream is determined by the flue, which is cut away in the block lower down, and in the top of the cap. Although the flue is in front of the lower lip, the wind stream is directed into the pipe as much as possible, which reduces the amount of turbulence at the lower lip. The onset of the speech is on the slow side, and there is hardly any extra sound—i.e., the sound made at the beginning of the note is no different from the steady tone. With the stopped pipes, the margins for the voicer are wider, and there is slightly more definition to the note. The combination of the two diapasons is therefore particularly suitable for use with viol consort. The sound is as close to a viol as an organ pipe can achieve, but with just enough presence to govern the time and the harmony. No other kind of organ can act as a substitute.

A voicing system with narrow scales and low cut ups has to have checks and balances elsewhere. In the case of these organs, control of the wind at the foot is most important. Toe-holes are difficult to measure, for wedges inserted in the toe usually supply the control, but the toe-hole area is always less than the flue area. There is a surprising range of wind pressures. At Knole the pressure is 80mm, at Staunton Harold 65mm, and at Canons Ashby it is 42mm (fig. 9.6). In these places, the original pressure has been lost with the bellows, but this range continues into the eighteenth century. At Great Packington in ca. 1750, the wind pressure is 50mm, whereas it is 75mm at Kedleston; both pressures must be close to the original. The effect is surprisingly small, suggesting that the variable effect of the pressure is smaller than the amount of wind admitted to the pipes at toe and flue.

The tuning most suitable for these organs has been lost, and has to be recovered from the music which they would have been required to play. I suspect that the tuning would have been fixed; in pipes which have not been cut down, the inside edge of the pipe tops have been chamfered with a knife to sharpen them, or built-up with wax, to flatten them. This suggests that the lead tuning shades came later, though not after the pitch was raised in the nineteenth century: the pipes have been cut down towards the fronts, leaving the back walls with their lead tuning shades at their original length.

The pitch of these organs was therefore sharper than we realize today, for the lead tuning shades lower it by up to a semitone. Most already indicate a high original pitch, varying from slightly sharp to about two semitones above modern pitch. The Russell Collection organ was definitely made at something close to the eighteenth century concert pitch (i.e., about a half semitone flat), and perhaps Belchamp Walter too, both organs perhaps dating from the end of our period. The Historic St. Luke's organ seems also to have been on the flat side. The others are all at varying degrees of sharpness.





ELEVATION, PLAN & SECTION
OF THE TOP CASE
OF THE
SEVENTEENTH CENTURY ORGAN
NOW AT CANONS ASHBY HOUSE IN NORTHAMPTONSHIRE
indicating the original disposition of the pipes
DRAWN BY DOMINIC GWYNN: WELBECK: MARCH 21st 1986

0 100 200 300 400 mm
SCALE 1:2

FIG. 9.6. *An elevation, plan and section through the upper half of the organ at Canons Ashby. The leaning pipes are not original, but are probably the result of an inexpert removal of the chest from thebottom board of the upper case, to which it was glued.*

This appears to confirm the widespread suspicion that our ancestors had a careless attitude to pitch, which is mistaken, and contradicts the general finding that viols of the period produced a low pitch. It may be that viols were made at different pitches, according to the composition of the set (whether it had a big bass for instance), and the type of accompanying instrument (lute, harpsichord, or organ). But it may have had as much to do with the way in which musicians and instrument makers were patronized, and music was made. After all, the LeStrange musicians would not have cared greatly what pitch the North musicians were using, nor would they necessarily have bought their instruments at the same shop. When a gentleman set up a musical establishment, he set out to engage musicians, collect manuscript music, buy viols and an organ, and find as good a music master as he could inveigle into his service. These all had to combine satisfactorily. If the music had notes not available on the keyboard, or the pitch of organ and viols did not agree sufficiently, or the tuning of the organ made life difficult for the viol players, then there would have been problems. Such matters would have been borne in mind. It would not have been too difficult for an organ builder to provide his organs at semitone steps, for these organs were built up in sequence from the base board and not assembled from more or less standardized parts, as became the practice in the eighteenth century.

What is particularly exciting about present studies of the music in aristocratic and gentry households of the seventeenth century is that these connections are starting to be revealed. It is only recently that the organ at Historic St. Luke's was associated with John Jenkins, who wrote some of the finest music in the viol consort repertoire of his time, while in the employment of the LeStranges at Hunstanton Hall in Norfolk, the Norths at Kirtling in Cambridgeshire, and elsewhere. It also looks as if the organ at Staunton Harold can be associated with the career of William Lawes, the other great composer of viol consort music in the twenty years after Orlando Gibbons died in 1625. His patrons at Staunton Harold—the Shirley family—collected 116 pieces in the Shirley partbooks, mostly in the hand of Lawes. Sixty-eight of them are also found in his *Great Set*, the collection which includes his most ambitious music for viols.

The place of the organ in this repertoire is also being recognized. Nobody has really explored the organ's importance in accompanying devotional music (e.g., in the recusant chapel and later the Laudian church at Staunton Harold) nor in songs (e.g., Roger North's sisters singing from their grandfather's poetry, set partly by Jenkins, in his collection published in 1645 as "The Forrest of Varrietys"). The organ's role has only somewhat been explored in viol consort music. Here, the organ—"evenly, softly, and sweetly acchording to all" as Thomas Mace put it in 1675—regulated the time and harmony of the players, occasionally supplied missing entries, or took an equal part in the conversation between the instruments. Its participation in the music of the period was probably the rule rather than the exception.[5]

[5] Peter Holman, "'Evenly, softly, and sweetly according to all'," in *John Jenkins Studies*, ed. Ashbee and Holman (Oxford: Clarendon, 1996), 353-82; Annette Otterstedt, "The compatibility of the viol consort with the organ in the early seventeenth century," *Chelys* 25 (1996-97): 32-52.

Finally, we still have a great deal to learn about the kind of contribution the organ would have made. The old instruments all stand in places remote from modern music making. The practical problems of bringing them into modern musical life means that they have been forgotten in the general quest for authenticity. Players have been content with the sound made by all-purpose anodyne, fluty box organs, and have tended to avoid the problems of using organs if at all possible. The result is that much music that should use organ does not. Whereas the homogenous sound of the seventeenth-century chamber organ encourages its player to take his part, the intrusive and unsuitable sound of the modern box organ encourages as modest a participation by the organ as possible. The parts are usually replicated by the unison stop, and discouraged when the texture is thin. Instead, the organ should be treated as an equal partner when it has an obviously independent part, and allowed to flourish in the consort texture. Nobody questions why the organ uses a complete chorus when it is accompanying a group of singers. Why should the rules be different for a group of viols?[6]

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[6] Editor's note: Dominic Gwynn has recently contributed *Historic Organ Conservation*, published by Church House Publishing in 2001.

Part 4

European and American Case Studies

10

Toward Restoration of the Salem Tannenberg Organ

George Taylor and Bruce Shull

The revival of traditional organ building skills in the late twentieth century is due in large part to builders' experience with old European organs, particularly those from the eighteenth century and before. For an American organ builder, however, there often seems to be little connection between the early European tradition and our own, which is now so strongly imprinted by the tastes of the nineteenth century. Rarely does the occasion arise to study the work of a truly eighteenth-century American builder. Yet the connection does exist and deserves serious attention. Any survey of American organ building in those formative years must focus in large degree on the work of David Tannenberg (1728-1804), the most prominent builder of his day. Tannenberg was a Moravian immigrant from Herrnhut, Saxony who learned his trade during a two-year period in Pennsylvania from the elderly Johann Clemm, a native of Dresden. Following Clemm's death in 1762, Tannenberg built some forty organs, largely for Lutheran and Moravian congregations. Although most of his instruments were small by our standards—single manual without pedal—his work was universally admired for its musicality and quality of construction. Of the nine Tannenberg organs surviving today, the most noteworthy are the three-stop organ built for the Moravian Church in Graceham, Maryland and the eight stop organ at Hebron Lutheran Church in Madison, Virginia. The latter has been in constant use by its congregation since 1802.

The only extant two-manual example of Tannenberg's work was built in 1800 for the Moravian frontier settlement of Salem, North Carolina. This thirteen-stop organ was Tannenberg's third largest, built at the conclusion of his career. In a letter to the church fathers of Salem, Tannenberg described the organ for Home Moravian Church as one of his finest.[1] Unfortunately his advancing age and failing health prevented him from making the long journey from his shop in Lititz, Pennsylvania to Salem for its installation. He had no choice but to send his son-in-law, Phillip Bachmann, whom he did not like or trust, to deliver and finish the organ. It is apparent from correspondence between Tannenberg and Salem that Bachmann's installation was less than satisfactory, especially in the matter

[1] The authors thank Paula Locklair and Nola Reed Knouse for supplying historical information from the files of the Moravian Archives, the Moravian Music Foundation, and Old Salem Inc., Winston-Salem, North Carolina.

of tuning, which was always a problem thereafter. The organ later suffered many intrusive alterations by itinerant craftsmen in ill-considered attempts to make it fit Romantic tastes. Since 1913 it has been in makeshift storage where, although little was lost, it has suffered severe damage.

During the past half-century, the village of Salem has been faithfully restored as an historic monument. The climate of historic preservation there has long fostered the dream of resurrecting the Home Church organ from the forlorn heap of parts it has become. On the recommendation of Barbara Owen, we were invited to consider the feasibility of its restoration. Her enthusiastic report on the remaining parts sparked our interest. Our prior experience in working with historic instruments included the repair and or restoration of some six eighteenth-century organs, three of which came to us in the 1970s when we were with the firm of John Brombaugh & Co. in Ohio. The first two organs required relatively minor attention. These were the Dutch cabinet organ by Strumpfler in the Toledo Museum of Art and the French parlor organ in the Frick collection at Pittsburgh. This delicate little instrument reputedly belonged to the daughter of Louis XV. An identical example is illustrated by Dom Bedos. Later projects involved increasingly more comprehensive restoration. Both the 1698 Johann Hartmann organ at the Church of the Brethren headquarters in Elgin Illinois, and the W. H. cabinet organ 1798 now in the Governor's Palace at Colonial Williamsburg arrived at our shop as a jumbled basket of parts. Both of these projects demanded skills of a high level.

The restoration which best prepared us for the Salem project, however, was the rescue in 1970 of the Madison Tannenberg organ which was at the time scheduled to be irretrievably damaged by conversion to electric action. This beautiful organ, still standing as built in a rural church in piedmont Virginia, had been repaired, but never altered in any significant way. Although its two multiple-fold wedge bellows had been bypassed by an execrable modern wind system, they still held a fleeting breath of wind when pumped by hand. The organ fairly begged to be saved. It was bold of us to tackle this project early in our careers, but the alternatives were worse. The work was in fact minimal, consisting of removing spurious parts, releathering the bellows and repairing those metal pipes which had been damaged by rodents. Pipe-scales were documented, confirming the intriguing connection between Tannenberg and Georg Andreas Sorge, the Saxon theorist and early advocate of equal temperament and logarithmic scaling, whose ideas Tannenberg incorporated long before they came into vogue. Unique and problematic characteristics of Tannenberg's pipe construction with his peculiar flat-faced languids (where did he learn this?) and the use of very low wind pressure (40mm) made for interesting discoveries during the project. After six weeks of work on site we were able to return the Madison organ to its original form. Today this instrument is considered the best surviving example of Tannenberg's work. It has had a profound influence on the wind systems of contemporary organs for it was in Madison that Charles Fisk first demonstrated the importance of having more than one bellows in stabilizing flexible wind.

Now, nearly thirty years later we approach the Salem restoration with both caution and curiosity. Opinions have long been rife about its original state and the authenticity of its parts. Some fear that in an effort to restore it to original condition worthy changes by nineteenth-century builders may be lost. In the face of these caveats, we decided to start by simply reassembling the remaining pieces as best we could. This plan left us free to study the organ without pressure to make decisions for its future. The reassembly on site proved invaluable, for we discovered, as we suspected, that some parts from the other organ which Tannenberg had built for Salem in 1798 were in fact stored together with pieces of the larger organ. This five-stop organ, known as the Saal organ, had been reconstructed by Charles McMannis in 1964 in the Single Brothers House at Old Salem. At that time, McMannis was unable to find the pipes of its three metal stops and so he substituted new pipes for them. In the absence of any traces of the original specification, he chose to copy pipes in the Madison organ as appropriate models. Recent discovery of the original Saal organ stop-list has proved that his choices were incorrect.

In July 1998, the Home Church organ was set up in the main gallery of the Museum of Early Southern Decorative Arts (MESDA) at Old Salem. The work was open to public view with the intention of raising awareness of the significance of this long-obscured treasure. It was by no means clear at the outset of the project how many parts of the two organs could be found or how much they had been altered from Tannenberg's design. Many lines of research had to be followed in order to make sense of the puzzle. One important key lay in the Moravian penchant for never throwing anything away. This meant that once the assembly showed parts to be missing, relentless searching of various dark attics where the organs were known to have been stored produced almost every component required for a meaningful restoration. In 1976, Norman Ryan of Durham, North Carolina had made the first important step toward the restoration by sorting the pipes and storing the parts carefully to prevent further damage. Also, the Moravian archives in Salem provided numerous documents without which we would have been unable to sort out the organs' dispositions nor follow the trail of alterations which both instruments underwent during the nineteenth century. Clues for separating original parts from later ones were found by dating materials and traces of tooling with the help of the museum staff. By the time the reassembly was completed, there was sufficient evidence to construct a hypothetical history of changes made to the instrument.

A particularly fruitful line of research throughout the project has been in the study of archival photographs of the organ. The earliest of the photographs (fig. 10.1) dates from about 1860, and was taken from the church's east gallery showing most of the church sanctuary with the Tannenberg organ in the opposite gallery. The sparse furnishings of the church with its non-upholstered, reflective surfaces bespeak a bright, reverberant space where the relatively gentle sounds of an organ voiced on low wind pressure must have been enthralling. In the photograph, the organ is housed in a light colored painted case with polished metal facade pipes. The top of the detached, reversed console and music rack is visible in the

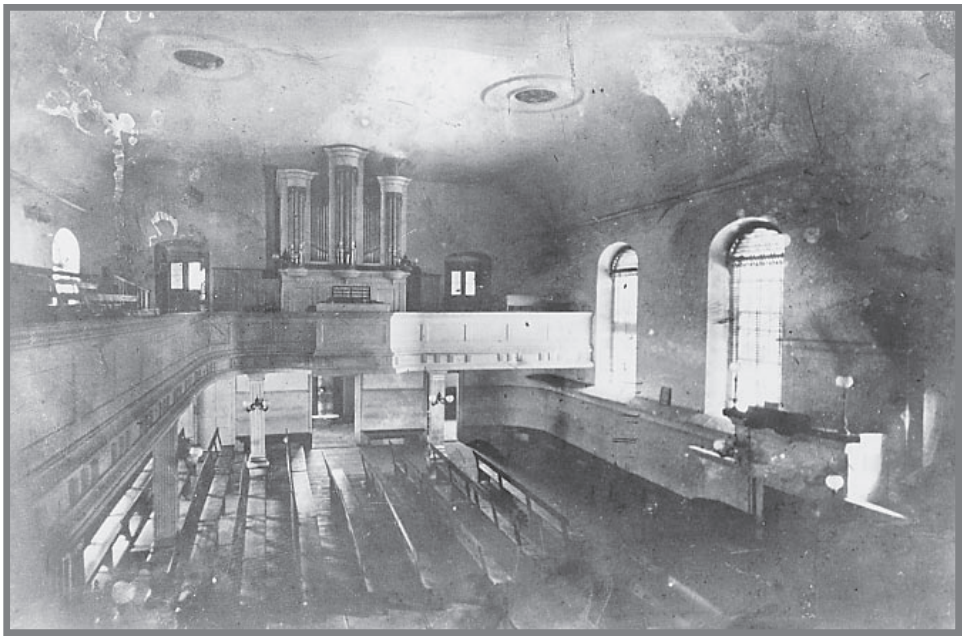

FIG 10.1. *The Home Moravian Church organ around 1860*

center and in front of the organ case. Church records of the construction of the church and organ mention the need for the projection in the gallery rail around the console.

On the left side of the case, the lower access door into the case stands open. Behind the door and running down the wall outside the left side of the case is the main wind line for the organ, which delivered wind to the organ from the three bellows in the attic. There seems to be a hint of some sort of decorative banding, perhaps gold or silver leaf, in the cornice and impost moldings. Projecting from the top of the case at the right side are three rectangular poles, apparently of wood. These clearly relate to pumping the bellows above. Written documentation and evidence in the case side panels suggest that this was not the original configuration for pumping the organ. Indeed there was much discussion regarding the pumping of the organ as it was being planned and built. The Salem Board Minutes of 22 April 1800 report, "We discussed whether the bellows for our new organ should be made for treading or for pulling, but decided to leave it to the organ builder." A footnote says that treading was chosen. The Aufseher Collegium records of less than a month later on 13 May 1800 remark, "We talked to Br. Bachmann, and he said that because of the suspension work and the rafters it is impossible to install the bellows for treading because there is so little space left for them. We thought that we should talk once more about this to him in the Collegium, because it is of such importance for our organ, and a possibility should be found to install the bellows so that they can be treaded." Perhaps it was important to early American Moravians that the pumper be out of sight, possibly in the attic. For whatever reason, the original bellows pumping configuration

proved unsatisfactory and less than two years after the organ was dedicated, we read in the Salem Diary of 14 October 1802, "The *Singstunden* were omitted this week while the bellows of the organ were being changed so that they could be blown by treading in the organ gallery." We believe that the photograph shows this configuration.

Apart from this ongoing concern about the bellows and pumping mechanism, the first recorded alteration to the organ came in 1845 with the addition by George Corrie of two treble nags-head swell boxes to the *Hinterwerk* chest. Rack-boards between the bass and tenor pipes were sawed through in order to fit the swell boxes against the toe boards. Each box was upholstered on the inside with cotton fabric over batting. The presence of these boxes greatly limited access to the pipework on both manual chests for tuning from that time on.

A second photograph (fig. 10.2) shows the organ after the repairs and extensive modification in 1870 by William Schwarze, the southern representative of the New York firm of Henry Erben. Schwarze replaced Tannenberg's keyboards with fashionable new

FIG. 10.2. *The Home Moravian Church organ after 1870*

ones and made the first alterations to the stoplist. He added windchest space on the back of the *Hinterwerk* grid for two sliders and filled out his tonal plan by cannibalizing the Saal organ for pipes. At that time, the Saal organ was dismantled and stored in the attic above the Home Church organ. To make room for these additions he had to violate the integrity of Tannenberg's backframe, which supported the cornice boxes. The most visible change was the painted wood graining of the case in walnut "to correspond with the pulpit." The bellows pumping rods can be seen in the photograph, projecting from inside the case up through the ceiling. The balcony had been deepened by this time next to the console, necessitating changes to the console's appearance. Originally the console was tucked into the niche in the railing and so had no side or back panels. Crude side panels were installed by Schwarze and uncarved scrollwork was added to the console sides on top of the gallery rail. The top molding on the console was enlarged by applying a molding over the smaller original. Note also in this photograph that the windline outside the case on the left side is gone but the wall has not been painted where it had been. Additions to the stop-list must have required more wind than the original windline could supply, for the windline was repositioned to enter the organ inside the case above the right side and an auxiliary duct was added to supply additional wind to the *Hinterwerk* pallet box.

Note the curious fretwork that runs around the organ at the top of the impost. It is quite plain, unlike the skillfully carved pipe shades. The fretwork sits in a slot grooved into the top of the impost molding and as such seems likely to have been part of the organ's original construction. This detail and the similar grilles beside the pedal pipes are unique among the extant Tannenberg organs. Both the organ for Tannenberg's home church in Lititz, Pennsylvania and his last organ, now in the York Historical Society have the same two stop pedal dispositions as the Salem organ, yet in both the Lititz and York organs the pedal divisions sit outside the organ cases behind the organ. The Salem organ case was built from Tannenberg's drawings in Salem under the supervision of Bachmann, with the assistance of a local Moravian cabinet maker, Jacob Fetter. Perhaps it was decided on site to extend the case sides and add the grilles to enclose the pedal.

The photograph of fig. 10.3 dates from around 1880 and shows the organ as it appeared until its removal from the church in 1913. Both the church and the organ had been extensively redecorated in Victorian style. Front pipes were painted and stenciled. The lower case was grained to resemble quarter-sawn white oak, although some of the previous walnut graining was left in bands on the impost. The upper case was painted and the cornice friezes stenciled. Note what appears to be a patch in the ceiling where the original windline had been. The main windline is visible entering the case through the right side tower behind the pumping rods. The rods themselves have changed from rectangular to round and are noticeably smaller than before. The slots in the ceiling for the rods have been extended, allowing the rods from the ceiling to pass through some roughly cut holes in the cornice molding outside the case panels. Again, something had changed in the bellows pumping but we are not sure of what or why.

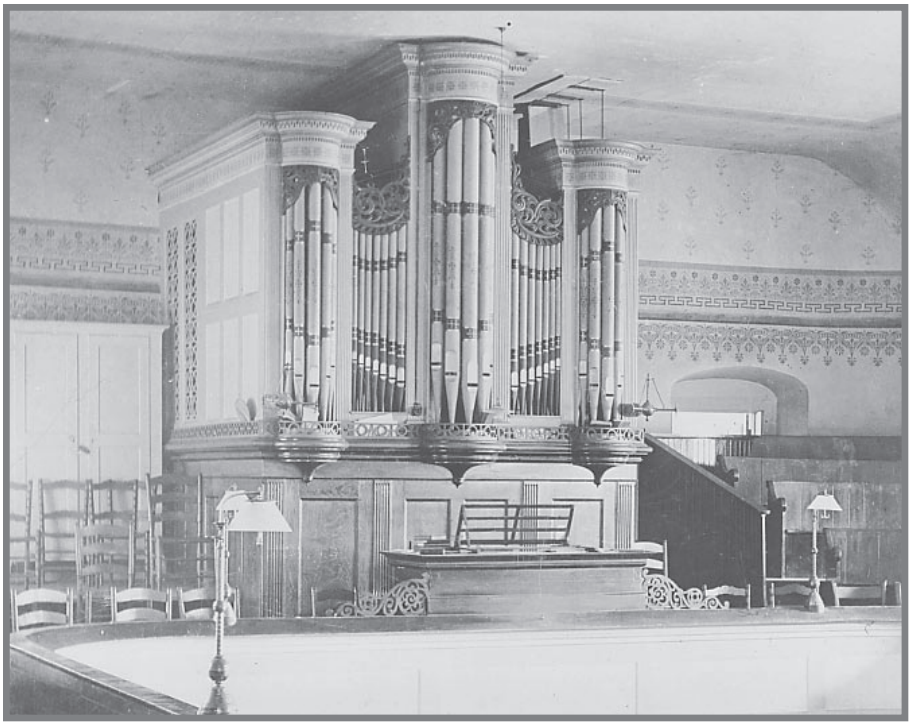

FIG. 10.3. *The Home Moravian Church organ around 1880*

In 1910, the organ suffered one last revision by S. E. Peterson, whose poor workmanship must have left the organ even less dependable than before, for three years later it was dismantled for storage. It was Peterson's stop-list which served as the starting point in the search for Tannenberg's disposition. Little progress was made in this regard until the startling discovery by the museum's curator, Paula Locklair, of original stop-lists for both the Saal and Home Church organs in the *Losungen*, or daily texts, from 1801 of Frederick W. Marshall. It became apparent from the order in which Marshall listed the stops that he copied them from top to bottom of the stop jambs, first to the left and then to the right of the keyboards. Armed with this information, plus the pipes (all of which proved to be of eighteenth-century provenance) and the much-altered stop action and rack-boards from Peterson's ill-fated revisions, it was possible to reconstruct the history of alterations in the placement of pipes (see fig. 10.4).

Figure 10.5 shows the Home Church organ following its reassembly in the gallery at MESDA. Though it appears somewhat the worse for wear, a portion of its original glory nonetheless shines through. Of its 644 pipes, 629 were found. The condition of much of the pipework is disheartening, especially in the facade where all the principal pipes had been effectively flattened. The lone facade pipe pictured here was restored to playing condition in our shop several years ago and gives sweet promise of the voice long silent in its sisters. And its bellows (fig. 10.6) survive in their original position in the attic of the church. They are the only example of a triple bellows eighteenth-century wind system left to us today. Furthermore, all but twenty of the 150 metal pipes for three stops of the Saal organ were the unexpected bonus of the reassembly project.

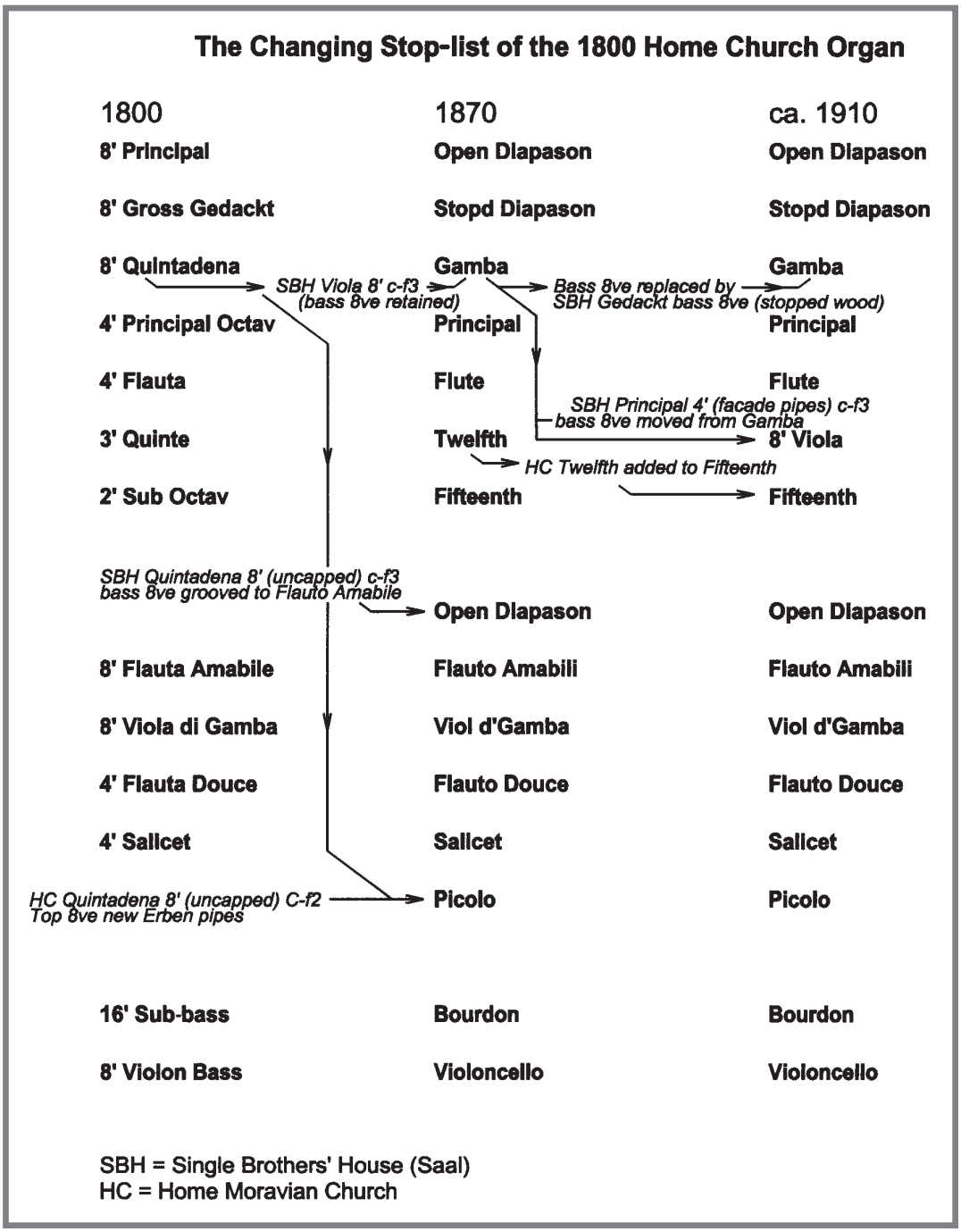

FIG. 10.4. *History of alterations to pipe placement and stop-list*

FIG. 10.5. *The Home Moravian Church organ after temporary reassembly, 1998*

FIG. 10. 6. *The original triple bellows in the attic of Home Moravian Church*

In November 1998, a conference was held at Old Salem to discuss these findings and the possibilities and pitfalls of restoration among interested parties. These included Barbara Owen, Charles McMannis, Laurence Libin, and several local authorities on Moravian traditions. The insights of Kristian Wegscheider, organ builder and restorer from Dresden, were particularly enlightening. Because of Tannenberg's Saxon origins and Johann Clemm's connection with Dresden, Wegscheider and others expected to find strong ties between Tannenberg's work and that of the famous Gottfried Silbermann. On studying the Madison and Salem organs, however, Wegscheider concluded that Tannenberg's work reflects the older organ building traditions of Saxony which were eclipsed by the Silbermann school. Rather than the bold voicing of Silbermann, these organs express the pietistic musical ideal of Lieblichkeit, or loveliness and sweetness, qualities so desperately lacking in our society today. One need only hear a poignant Moravian hymn played on the frail Dolce Principal in Madison to experience this in a way that words cannot describe. Wegscheider was convinced that the Salem organ fits this rural Saxon tradition in so many details that one can surmise with reasonable assurance how its few missing parts would have been made, and thus could be replaced.

Nevertheless, several important questions remain. We know that the pitch of both organs has been altered. Hopefully, Tannenberg's pitch can be ascertained from the facade pipes once they are restored, since their overlength may indicate original slot heights. In this regard, two small open wood pipes from the Saal organ were discovered which had been overlooked and replaced in the 1964 restoration of that instrument. These pipes play a lower pitch than the present organ, possibly offering a clue to its first pitch. There is also a question to what degree it is wise or possible to reverse modifications made to the voicing during the nineteenth century. Also, the original keyboards and stop rods are missing; we have no other examples of either from a two manual Tannenberg organ with a detached console to copy. This much seems clear: since the rebuilding of the Home Church organ utilized pipework from the Saal organ, any restoration of the organ other than to its original state is unreasonable. To do so would deprive the Saal organ of its original pipework. This conclusion, fortunately, falls in line with the current European dictum in organ restoration which maintains that only material of equal or higher quality construction as the original should be considered for retaining. On this point there can be no quarrel. With the possible exception of alterations to the wind system, which may have been inadequate from the beginning, subsequent changes to the Home Church organ do not reflect the craftsmanship of America's first organ builder.

Finding a proper place for the restored organ is problematic. The shape of the gallery at Home Church has been radically changed since the organ was removed and the church's acoustics no longer offer a friendly setting for the Tannenberg's eighteenth-century voice. Plans are currently underway to construct a small hall to display the organ in the Old Salem visitor center. The musical success of this venture, and indeed of the entire restoration, will hinge on the degree to which the new space complements the organ acoustically and evokes the spirit of its first home. One can hardly exaggerate the importance of this issue.

These questions notwithstanding, it appears that a meaningful restoration of this instrument in its original configuration is eminently possible. Its museum setting encourages the most careful research prior to the work of restoration. It is our hope in this undertaking to bring together our own experience with the knowledge of many others and, laying aside prejudices, to allow this lovely organ to tell us what it once was and what it should now be.

We have recently reflected afresh on the meaning of our encounters with the Salem organ and other extraordinary antiques. Each project has been proven unique in what it has required of us and in what it has given us in return. This dynamic encounter between craftsman and artifact seems to me to lie at the very heart of what has saved organ building today from a dismal future. Through our privileged interaction with instruments from periods more aesthetically astute than our own, we have found the organs themselves to be the real teachers who continually surprise us by expanding our horizons. It is as if we are stepping forward into the past. We are well aware that this enterprise is fraught with risk. Any alteration to a musical instrument new or old, even routine maintenance for that matter, risks changes to the builder's intentions. One need only consider what a fine line there is between maintenance, repair, and restoration. Mistakes are bound to be made from time to time. In those cases, such as with the Smithfield organ where, because of its rarity and poorly understood history, a path toward restoration is not obvious, the greatest caution and respect must be shown. There is no question that we shall be held responsible for our decisions by future generations, who will have little patience with damage we cause through recklessness, ignorance, or pride. But we would argue that without the flesh and blood involvement of organ-builders with their heritage, the craft will once again wither. Had we not dared to take one hopelessly damaged reed tongue in that little French organ and make it play again (with such astounding results) we might never have learned what we now know about tempering reed brass. Likewise, little is so rewarding to an instrument builder as to ponder how one should solve a problem in restoration only to discover later in the project as we did with the Hartmann organ that the builder had reached the same conclusion. It is this brotherhood of craftsmanship, this meeting of the minds across the centuries that infuses our work daily with interest and vitality. As builders we would like to think that, at the risk of some loss to our instruments, our followers may find our organs to deserve their care and improvement and perhaps to learn from them in some small way what we have so richly inherited from our forebears. We can only hope that our predecessors would pardon our offenses and be pleased to know that their work speaks to us as fits our needs.

11

Organ Restoration: Problems and Solutions

Raymond J. Brunner

During the twentieth century, the appreciation of our musical heritage increasingly resulted in the preservation and restoration of historic pipe organs. We now have numerous instruments of many builders which have been carefully preserved and restored, allowing us to hear the music of eighteenth- and nineteenth-century composers exactly as they heard it. The ability to experience the sounds of these diverse organs has been a great educational tool in understanding the development of organ music in America and elsewhere. It is organ restorers who have been entrusted with the task of bringing these organs back to life, and their decisions can greatly affect the outcome and the authenticity of the sound.

As recently as fifty years ago, the concept of organ restoration as we know it today in the United States was essentially unknown. Old organs were often discarded in favor of new organs or, if kept, were often substantially altered or modernized. Organs of the eighteenth or early nineteenth centuries which had managed to survive were often silent, consigned to the category of quaint artifacts. Organ builders had always built new organs in the style of the day and few would even consider working on a historic instrument. In the 1950s, interest in historic organs began in earnest, paralleling the revived interest in mechanical-action instruments. The Organ Historical Society was founded in 1956, and active efforts at preserving and restoring organs began.

The organs of Pennsylvania German builders are of particular interest. This school of organ building had its basis in the work of Johann Clemm, David Tannenberg, and other German immigrants. They built German-baroque style organs for Pennsylvania churches well into the nineteenth century. Many of these unique instruments have survived in country churches in Pennsylvania and in local historical societies and museums. Most of the instruments were not so fortunate, falling victim to changing tastes, church congregations outgrowing the buildings or organs, and loss by fire.

The systematic destruction of these organs continued until the end of the 1950s. During this decade, a four-stop Tannenberg positive organ of 1775 was removed from a church museum, its pipes and internal parts removed and thrown away, and the Chippendale case turned into a bookcase. In 1957, a disastrous fire at Lititz Moravian Church destroyed fifty percent of the 1787 Tannenberg organ stored in the attic, including most of the casework

and the bellows. That same year, an 1857 Thomas Dieffenbach organ was hauled to the dump, and in 1959, an 1818 Christian Dieffenbach organ was destroyed by fire. Since then, we are fortunate that no more of these important early organs have been lost.

At about the time this destruction was ending, efforts were being made to preserve and restore some of the organs. The 1804 Tannenberg organ was brought out of storage and set up in the museum of the Historical Society of York County, where E. Power Biggs brought attention to it by recording several pieces. A 1793 Tannenberg positiv organ was moved from Graceham, Maryland to the Lititz Moravian Church where it remains in use. In 1960, the Organ Historical Society visited many of the early Pennsylvania organs, encouraging churches and museums to use and respect the instruments. Organs built by the Dieffenbach family, the Krauss family, and by John Ziegler, were repaired and put back into use by churches and museums. Probably more than one of these organs escaped destruction due to these efforts.

Unfortunately, some of the restoration work done on these organs was carried out by well-intentioned, but poorly trained individuals who lacked an understanding of historical methods or were little more than amateurs. Restorations entrusted to organ factories or local technicians were not much better. This work often resulted in unfortunate destruction of original parts and irreversible damage to the organs. The result was sometimes far from musical and rarely authentic, but at least the organs were being saved and there was a growing respect for them.

Alterations made to historic organs are usually difficult to undo. Many original winding systems were discarded over the years in favor of supply house regulators and blowers, the original bellows being judged too difficult to restore. The results of these winding changes were almost always severe, as oversized or worn-out blowers provided turbulent and noisy wind to small, spring-loaded reservoirs, feeding the windchests with flexible rubber ducting. Early restoration attempts often left these types of alterations in place, or even worse, continued the practice of removing the original winding system. Often, keyboards, casework, and pipes also fell victim to change.

More challenging and difficult decisions arise when another builder whose work merits preservation, did the alterations. An example of this problem involves organs built by the Dieffenbach family. Most of the organs built by Christian Dieffenbach early in the nineteenth century were modified fifty years later by his grandson, Thomas. These changes are part of the evolution of the instruments and have historical value in themselves. We must not be too quick to undo these changes, particularly when the changes involve useful additions.

Another common alteration was the changing of original pitch and temperament. Few early organs have escaped the periodic attention of organ builders and tuners. Pipes were often cut down to raise the pitch, original temperaments were lost, cutups were raised or lanquids received additional nicking. What should we do in this case? Some restorers go so far as to melt down and recast the pipes in an attempt to recover historic characteristics. Is this really restoration, or simply further destruction? It certainly is not preservation.

Every restoration presents new problems and difficult decisions. The following three examples illustrate how two centuries of change and restoration have affected them. The first example is the 1787 David Tannenberg organ built for the Moravian Church in Lititz, Pennsylvania (fig. 11.1). This organ underwent a century of use followed by moving, alterations, and rebuilding, years of storage, and, finally, near destruction by fire.

FIG. 11.1. *David Tannenberg organ built in 1787, restored 1983, Lititz Moravian Church*

Significantly, Tannenberg built the 1787 organ for his own church. Tannenberg's original intention to build a two-manual organ were rejected by church elders, and he had to settle for a one-manual and pedal organ of nine ranks. The organ remained in use in Lititz until 1879, when it was moved to the Moravian Church in South Bethlehem.[1] The original

[1] William H. Armstrong, *Organs for America, The Life and Work of David Tannenberg* (Philadelphia: University of Pennsylvania Press, 1967), 100.

double attic bellows were left behind in Lititz, and a new hand-pumped feeder and reservoir system was built for it. The builder who constructed the new winding and set up the organ in Bethlehem, was probably Charles F. Durner of nearby Quakertown. The pitch of the organ was probably altered at this time. Other changes were made to the appearance; the original white painted case was partially grain painted, and the moldings of the tower cornices were painted Victorian pink and purple colors.

In 1910, the organ was dismantled and returned to Lititz, where it was placed in storage. The motives for this are unclear, but it indicates the high regard with which the Moravians held Tannenberg organs over a century after his death. It appears that some parts of the organ were stored in the church attic and other parts were stored in the adjacent single brother's house attic. As workmen were burning paint off the exterior of the church in 1957, they accidentally set fire to straw insulation in the roof. The fire quickly consumed the church, along with the bellows and other parts of the organ.

In the 1970s, a project was initiated to restore the organ. James R. McFarland was selected to conduct the restoration. His task was not only to restore the surviving parts of the organ, but also to reconstruct the missing portions as well. This involved considerable research before beginning any work. Fortunately, there was much material upon which to draw. McFarland set about visiting and studying the eight remaining Tannenberg organs, documenting with photographs and measurements the parts which were similar to missing parts of the Lititz organ. The two-manual organ in storage in Winston-Salem yielded much valuable information, as it contains the only original attic bellows and pedal windchest, both missing from the Lititz organ. In addition, an important discovery was Tannenberg's original dimensioned case sketch of the organ in Moravian archives. This drawing was almost certainly the plan given to the cabinetmaker responsible for the original construction of the case in 1787. These plans were invaluable since all the casework had been lost except for the front pilasters, upper side panels, two tower cornices, and assorted carvings. All missing portions of the organ were faithfully recreated, including a new attic bellows. This thoughtful and responsible approach resulted in a historically accurate reconstruction of the organ.

The next example is the 1804 Tannenberg organ, built for Christ Lutheran Church in York, Pennsylvania (see fig. 11.2). This one-manual and pedal, thirteen-rank organ was the last instrument which Tannenberg built; during the final tuning, he collapsed and died. As with the Lititz organ, this instrument also underwent substantial alterations. The first changes were probably made when the organ was moved to a reconstructed gallery when the church building was remodeled in the nineteenth century. A photograph from this period shows that the organ was painted a dark color, probably with the simulated grain painting fashionable during the time. The center tower was also lowered by about a foot to fit the new gallery. After Christ Lutheran obtained a new Felgemaker organ in 1893, the Tannenberg organ was moved to the chapel. Midmer and Sons of New York undertook the move in 1906, and made considerable structural changes at that time. The main windchest, which in all Tannenberg organs is supported by the casework, was now installed on an

FIG. 11.2. *Last organ built by David Tannenberg, 1804, for Christ Lutheran Church in York, Pennsylvania. Shown at Historical Society of York County after 1990 restoration work.*

internal chassis. The case was cut apart, with the front kept intact and the lower side panels installed on either side of the front with dummy, zinc facade pipes above the impost. The upper side panels and back were discarded but, fortunately, the sides and backs of the tower cornices were left intact. A typical nineteenth-century style internal bellows was installed with feeders and reservoir. The stop action was altered and new manual and pedal keyboards were provided. While the manual key action was left intact, the pedal windchest and coupler action were replaced by a tubular pneumatic system to allow the Pedal pipes to be placed at the sides of the organ. Tonal changes included replacement of the Trumpet with a new Oboe and removal of the tierce rank from the Mixture. The wind pressure was increased, requiring the cutups to be raised on the wood flutes and Quintadena basses of the Gamba.[2]

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[2] Raymond J. Brunner, *That Ingenious Business, Pennsylvania German Organ Builders* (Birdsboro: The Pennsylvania German Society, 1990), 93-95.

The organ was used in the chapel until 1945 when it was taken down and given to the Historical Society of York County. The organ was put in storage until 1959 when a restoration was undertaken by Fred Furst of York. Almost all of the Midmer changes were left intact except for the changes to the case and the addition of an electric blower. A York cabinetmaker made new upper case sides and grill panels to hide the pedal, dutifully copying details from the Winston-Salem organ. No back was provided, and the sides were simply provided with cleats and screwed to the front.

Mr. Furst was a local organ builder whose business involved recycling used pipework from old tracker and pneumatic-action organs for use in new electro-pneumatic instruments. According to his standard procedure, he painted every square inch of the Tannenberg organ, inside and out, with yellow paint. Misunderstanding Tannenberg's pipe marking system, the restorer mixed up many principal ranks, remarked pipes, and installed them wherever they seemed to fit. Finally, the pitch was raised, slide tuners were installed, and slivers of metal cut off the pipes were carefully saved in a cigar box. Clearly, inappropriate things were done to the organ at that time. The purpose of presenting this is not to condemn those involved with the work, but to show how far we have come in restoration practice. In spite of the shortcomings of this work, the organ received considerable notice and certainly helped encourage an appreciation for historic instruments.

In 1989, the Historical Society of York County undertook a major renovation of its galleries, which necessitated moving the Tannenberg organ. As part of the move, funding was available to begin serious restoration work on the instrument. Our firm, R. J. Brunner & Co., was chosen to do the work. With personal experience gained in reconstructing the casework of the Lititz organ, as well as restoration projects on a number of other Pennsylvania German instruments, we felt well prepared to undertake the project. Since funding did not allow a complete restoration, we had to decide how much could be accomplished in this first phase of work. Our actions are described below, with the goals they were to address:

1. Restore the casework to its original appearance. This meant reconstructing the floor frame and impost, which had been cut apart. Missing portions were replaced and the dovetail joints at the corners were carefully recreated, using whatever original woodwork remained. New upper side panels were made, as were new stiles and back panels. The center tower was restored to its original height, and the three largest facade pipes, which had been mitered back, were straightened. The main windchest could then once again rest within the impost, supported entirely by the casework as Tannenberg intended. All new wood surfaces were carefully hand-planed to duplicate the look and feel of the original parts. The exterior of the casework was carefully sanded, primed, and finish coated in the original off-white color. We avoided stripping off the many previous layers of paint, choosing to repair most of the mechanical damage and sand the moldings to restore the detail. All paint was carefully brushed on to duplicate the original look and feel.

2. Restore the main windchest. German windchests present some unique challenges. An advantage of this type of chest is the use of sponcils to fill in the note channels, eliminating the troubles of an applied table, as in English organs. A common problem with a German sponcil chest is cracking and loss of wind from the note channels, caused by low humidity. Since the cracks on the bottom of the windchest are working joints, any solid filler would be sure to fail. The solution in this case was to glue strips of leather over the cracks to prevent air leakage, yet allow wood movement. We have found that even in a museum situation where attempts are made to maintain constant humidity levels, they usually fluctuate enough to cause significant expansion and contraction of the wood seasonally. Other windchest restoration included replacement of the slider bed leather on the top of the chest, new pallet valves to replace the considerably altered originals, and new leather purse seals on the pallet valve pull-down wires.
3. Restore the manual key and stop action. The original roller board, square rail, and backfalls survived, as did most of the manual trackers. Midmer had replaced most of the stop action, so new stop toggles and trundles were made.
4. Remove all yellow paint. This part of the restoration required many hours of carefully stripping paint, without destroying the original wood surfaces.
5. Partially restore pipework. All pipework was cleaned and repaired as needed. Stopper leather on wood pipes was replaced and cutups were lowered on the 4′ Flute by applying thin wood veneer to the upper lips. The missing third rank of the Mixture was replaced. The Trumpet stop presents a more difficult challenge, as there are no extant reed stops from any Tannenberg organ to copy or even an accurate description of one. For now, the Midmer Oboe remains in place.

We hope that future work on this organ can include replication of the missing pedal windchest, action and coupler, and provision of a falling bellows system.

My final example is the Samuel Green organ that our firm completed for the Metropolitan Museum of Art in 1998 (see fig. 11.3). This is a fine example of an English chamber organ, built late in Green's career. The nameboard inscription records that Green made the organ in Isleworth, Middlesex to which Green moved in 1789. The organ was thus made between this date and 1796 when Green died.[3] Exactly how it came to North America is uncertain, but it eventually made its way to Plattsburgh, New York, where it stood for many years in the Kent-Delord house, and was finally acquired by the Metropolitan Museum. It is a four-rank organ containing an 8′ Open Diapason, 8′ Stopped Diapason, 4′ Principal, and 2′ Fifteenth. The Open Diapason shares basses with the Stopped Diapason; and the Principal and Fifteenth are divided.

[3] David C. Wickens, *The Instruments of Samuel Green* (Metuchen, N.J.: Scarecrow Press, 1987), 6.

FIG. 11.3. *Chamber organ by Samuel Green, ca. 1796. Restored in 1998 and on loan to Moravian College, Bethlehem, Pa., from the Metropolitan Museum of Art, New York.*

The restoration of this organ was straightforward in many ways, compared to the more severe problems encountered in the previous examples. The organ has survived in a remarkable state of preservation, retaining all its original pipes, action, and winding. All the original leather was intact in the wind-chest. The only past rebuilding work of any consequence was releathering of the bellows, first by an organ shop in the nineteenth century, and then by an amateur in the 1950s or 60s. The beautiful mahogany casework even retains its original finish.

While most aspects of this restoration were typical, such as cleaning, bellows releathering, keyboard and action work, and pipe repairs, there were some difficult problems to deal with. Remarkably, the windchest had never been rebuilt, but the oak table was severely cracked. The dry North American climate was not kind to this windchest, and wide cracks

had opened under each slider, most of the cracks passing through borings in the table or along glue joints. It was obvious that the organ had not been played for many years—perhaps a century—due to the failure of the windchest table.

Not wanting to remove any more original material than necessary, we chose to repair the original table. Complete removal and re-gluing of the table did not seem viable, as the wood had shrunk considerably, and the total width of the table would no longer match the windchest grid. We chose to rout along the cracks and inlay oak strips to fill the voids. We then carefully re-glued the table to the grid wherever it had come loose. After inlaying the new wood, any lost holes were rebored and aligned with the sliders and toe boards. The slider bed leather was replaced and the sliders were carefully refitted.

The bottom of the windchest presented some problems as well. The chest bottom was covered with leather, unlike German windchests with their wood fill-ins or sponcils. This required removal of the wood spine, as this member had been installed after the grid was covered with leather. Once all the leather was removed, we were able to seal all the note channels and the underside of the table to prevent runs. After covering the chest bottom with new leather, the spine was re-glued, and the releathered pallet valves were glued in place.

Although the organ had survived in a fine state of preservation, one significant alteration had been made to it. Probably after it arrived in America, the pitch of the organ had been raised considerably to make it conform to the higher pitch then in use. It had also been tuned to equal temperament. Examination showed that the three metal principal ranks had been cut down, but the wood Stopped Diapason was mostly uncut, with the stoppers simply pushed down in the pipes to sharpen them. A decision was made to install stainless steel slide tuners on the Open Diapason, Principal, and Fifteenth so that the pitch could be lowered and an appropriate temperament could be used. We viewed this as a noninvasive, adjustable, and removable addition to the organ. It also gives us the opportunity to try different temperaments without any damage to the organ. The organ is currently at A-435 and set to the mean-tone temperament of the Green chamber organ at Attingham Park, England. The addition of metal to the pipes is an option that could be considered at some future time.

Finally, I would like to stress that restoration of a historic instrument involves careful preservation of as much original material as possible. Great care must be taken to avoid nonreversible procedures. Once an original part or pipe is replaced, or the surface patina of the wood and metal is destroyed, it can never be regained. When there is doubt, a careful restorer will err on the side of doing too little to the organ. The temptation to over-restore must be avoided, especially when it involves removal of historic changes or speculative recreation of missing parts. We must make sure that our work is well researched, documented, and carried out with the same craftsmanship used by the original builder. Only in this way will our work be respected by future generations.

12

The Only One in the World: Two Case Studies from the Baltic States

GÖRAN GRAHN

Since the Baltic States, Estonia, Latvia, and Lithuania regained their independence in 1990-91, their churches could act freely again, and religious teaching was again allowed with growing congregations as a result. To a large extent, during the time of Soviet occupation (1940-41 and 1944-91) the church buildings had been converted to factories, stores, or museums. As church buildings have been returned to their previous owners, the question of restoring organs has come up. During the occupation, the lack of financial resources very much hindered restoration activity. In order to prevent future mistakes, the author has recently been active in assisting with advice for future restorations as financial situations improve. These countries possess organ builders with good skills and competence, able to carry out future restorations of their instruments. The two instruments described in these case studies are not yet restored. Conclusions and restoration suggestions must be preliminary, since many questions are bound to arise when actual restoration work commences. The case studies are based on observations and documentation preliminary to writing restoration programs.

Edole

The first organ described here is situated in the village church of Edole (Edwahlen)[1] in the county of Kurzeme (Courland), Latvia. It was built in 1784[2] by Christoph Wilhelm Braveleit, who was an apprentice of the organ-builder dynasties of Caspari and Casparini in Königsberg.[3]

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[1] Place names are shown in the modern form followed by the older German form in parentheses.

[2] According to a damaged label glued inside the organ case, "dass durch dieser . . .dieser Kirche derü allein(. . .) Jesu Christ[r] Zuversicht anbeten(. . .) Im Jahr des Herrn 1784 habe ich Herrmann Friedrich Behr Erbherr der Edwahlischen Güter Weise Orgel von Grunde aus neu Wunsch dem Herrn Orgel-Bauer Christian Willhelm Braweleit wohnhaft zu Tuchum bauen lassen wofür Ihm die alte Orgel un vierhundert Rhtt.alb."

[3] Paul Campe, *Lexikon liv- und kurländischer Baumeister, Bauhandwerker und Baugestalter von 1400-1850*, I:338, no. 2138 (Stockholm, 1951); in typescript, Swedish Royal Library, Stockholm, L57Q/24.

The organ is built in the Königsberg[4] tradition and shows great similarities with the organ in the Dominican church in Vilnius, Lithuania built by Adam Gottlob Casparini in 1776.[5] The Vilnius organ is the only large organ (II/P 30) surviving from this builder and tradition.

The Edole organ (fig. 12.1) originally had thirteen stops on one manual. The exact original specification is not known, but compared with other organs of the same tradition preserved in Lithuania, and a documented original specification of a preserved organ case in the R.C. Church in Kuldiga (Goldingen), a possible original specification of the Edole organ can be assumed (see Appendix 1). A major rebuilding of the organ was made in 1852, by a local organ builder Karl Herrmann of Liepaja (Liebau).[6] He romanticised the organ and reduced the number of stops from thirteen to eight. This consisted of lowering the windchest in order to house an open bass of an added 8′ principal. He also extended the case at the back by retaining and moving the back wall and adding new sides to add a Sub-bass. The original pallet box was adapted with new pallets for the added 16′ pedal Sub-bass and the rest of the manual pallet holes were blocked (fig. 12.2). The probable 8′ Trumpet was removed and its place was used for a toe board connected with lead tubes underneath the catwalk to the Sub-bass pipes. A manual coupler was avoided by letting the pedal pallets let in air to both the manual and separated pedal channels. The original manual pallets were moved into a new, second pallet box at the front end of the windchest. The pedal action tracker threads were led between the manual keys via squares to a new second roller frame underneath the original one for the manual. The roller arms of the manual rollers were moved to the front end to fit the new pallet box. The restorer also exchanged the original bellows for two new wedge bellows.

Although the exact specification after Herrmann's redesign is unknown, it is clear that he used most of the original pipework, and moved pipes in order to obtain a wider scale and a more romantic concept (see Appendix 1). Some parts of the case 4′ principal were used in the rebuilding. The principal treble was disconnected completely, and has therefore remained as one of the better preserved parts of the organ. By trying some of the treble pipes, it seems even possible to reconstruct parts of the original temperament. This will of course be further investigated when the actual restoration work starts.

The original Bourdon 16′ and Gedackt 8′ were reused almost intact and so are also well preserved. The original Mixture was recomposed, using various fitting pipes from the original principal chorus and Spitzflöte 4′. It becomes quite obvious that, to a great extent, Herrmann must have improvised on the spot in order to obtain a romantic, low-pitch two-to-three rank Mixture.

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[4] The town Königsberg is today called Kaliningrad and lies in the territory of the Russian Federation.

[5] Carved signature on organ case.

[6] Campe, vol. 1, p. 411.

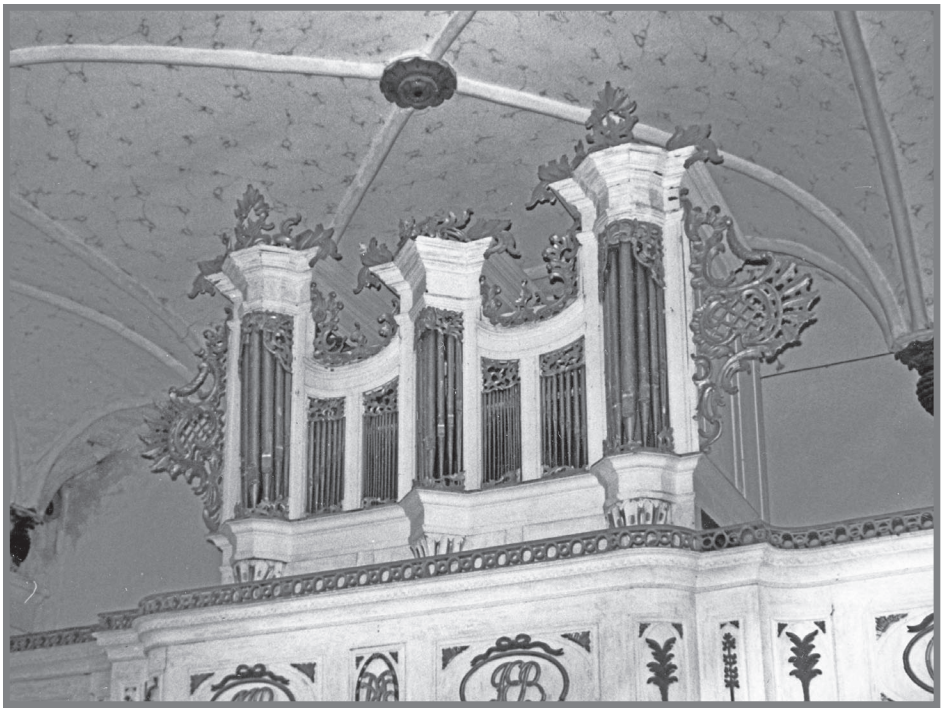

FIG. 12.1. *The organ at Edole, Latvia*

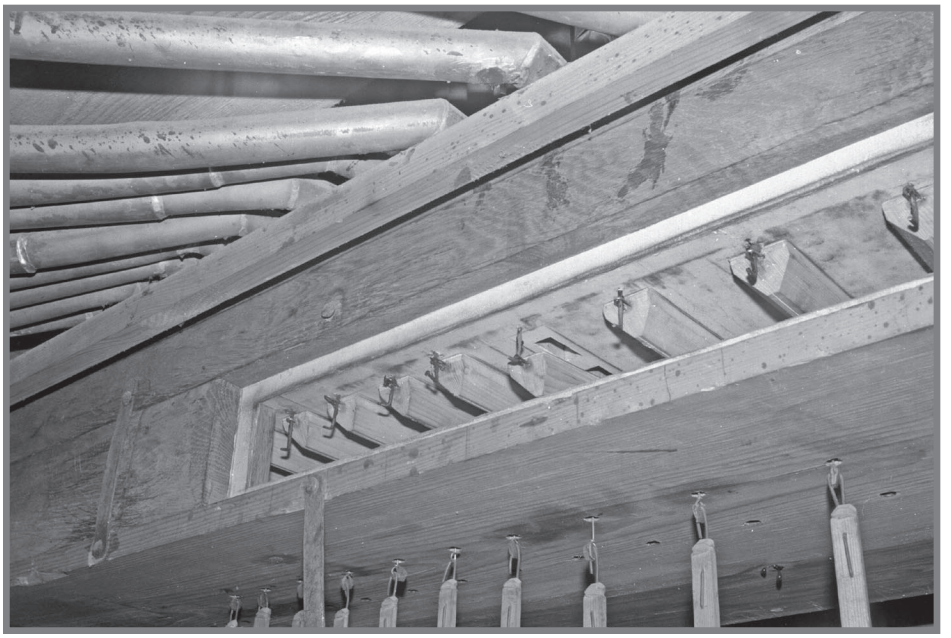

FIG. 12.2. *Edole organ. Pallets for pedal pipes in original pallet box*

In 1902, Karl Alexander Herrmann, son of Karl, rebuilt the organ a second time. He redesigned the original console on the south side of the organ case and exchanged many of the action parts to imported factory-made ones. He also exchanged two of the stops for two romantic 8′ string stops of imported factory-made pipes. In this state, the organ has remained until today with no alterations except from tuning and adding an electric blower.

The 1902 rebuilt organ deviated furthest from the original concept. By comparison with better preserved similar instruments, its sound is a shadow of the presumed original. However, most of the original pipes have fairly well-preserved voicing. The rebuilds of them have also not been carried out well enough to form a convincing whole as a romanticised instrument worth preserving as such, especially when compared to other preserved instruments that were built new by father and son Herrmann.

In a future restoration, the most important aim should be to preserve the original *Braveleit* material in the best possible way. A restoration or repair of the organ in its present state would surely cause further damage to the original pipes, since they would have to be adjusted and tuned to a position and pitch for which they were not designed. The suggested future restoration has thus been to substantially reconstruct the organ's assumed original state. Some parts from the first rebuilt organ will fit well enough to the original state that they can be retained, such as the wedge bellows made in 1852. This will also mean retaining the extension of the case at the back to house these bellows. The extension can also continue to house the Sub-bass, but a new separate windchest in the style of Herrmann can be added. By these measures, it will be possible to retain part of the organ's history, including the slightly extended usability it possesses by the added pedal board.

The reasons for coming to these preliminary conclusions have been the following:

- There are good examples for reconstruction of details, including stop leavers and keyboards in preserved instruments by Casparini and his followers in Lithuania.
- The original pipework is in great need of repair and should be "immunized" against possible future unprofessional repair. A well carried out restoration that appears orderly inside will not be so prone to damage by tuners. The reconstructed parts will not remove or alter any of the original material, which means that the reconstructed stops can be remade later if future research would give new results.

The suggested measures would then be as follows:

- Make detailed documentation of all parts of the instrument.
- Restore the windchest to its original state; move back the original pallets to the original pallet box and place the windchest on its original level.
- Reconstruct the original console, following the design of the Casparini organ in Vilnius.

- Restore the action, and move its parts back to their original positions.
- Reuse the bellows built in 1852, and reconstruct the original windtrunks.
- Return all original pipes to their original positions, reconstruct missing stops, following examples from the existing pipes in the organ, and, when not existing, from the Casparini organ in Vilnius.
- Whether the original pipes should be lengthened by soldering on new metal, or by adding tuning-slides is still to be discussed. The Swedish practice has so far been to solder on new metal, whereas organ builders in the Baltic States often use tuning-slides, in order to avoid cutting off original material.
- Retain the pedal pipes and add a separate, new windchest in the 1852 case extension; reuse the pedal pallets from 1852 in the new pedal windchest.
- Mark all removed parts and store them in specially constructed cases near the organ or in the church tower.

This case study has shown that reconstruction in one way or another appears to be the most logical way to proceed, in order to obtain the most careful treatment of the original material, as well as giving it back some of its original vigor.

Kihelkonna

The organ described in the following case study stands in the village church of Kihelkonna on the island of Saaremaa in western Estonia. The organ was built in 1805 by Johann Andreas Stein.[7] Stein came to the Baltic region during the mid-eighteenth century together with his father-in-law, Heinrich Andreas Contius.[8] They both came from Thuringia (Thüringen) in Germany where they had been active as organ builders. They represent the other great influence on the organ building tradition of the Baltic region, parallel to that of the Königsberg builders. Their first works in this region were to rebuild the organ in Riga Cathedral, Holy Trinity Church in Liepaja (Liebau), and also to build new organs in Jekaba baznica (Jacobikirche) in Riga, Oleviste kirik (Olaikirche) in Tallinn, and elsewhere. Today their most substantial surviving fragments are in the heavily enlarged organ in the Holy Trinity Church in Liepaja, and the case of the organ of the Jekaba baznica (Jacobikirche) in Riga (today the R.C. Cathedral). When Contius died, Stein settled in Pärnu (Pernau) in Estonia where he built up his workshop. The only remains from Stein's

[7] The donor's dedication plate on the case, as well as an inscription in pencil on the inside of the case: Campe, vol. 2, p. 160.

[8] Campe, vol. 1, p. 296, no. 1931.

work today, apart from Liepaja, are the case and some pipes of the organ in the village church of Suure-Jaani in Estonia, built in 1804, and the organ at Kihelkonna in Estonia, built in 1805 (fig. 12.3).

FIG. 12.3. *The organ at Kihelkonna, Estonia*

The organ at Kihelkonna was originally built with one manual and pedal and fourteen stops. In 1848, it was repaired by Ernst Kessler from Tartu (Dorpat), Estonia.[9] The relationship between Stein and Kessler has not yet been researched, but their case designs show some similarities, with Kessler being rather old-fashioned for his time.

[9] Pencil inscription on inside of case.

The greatest rebuilding work took place in 1890 when Fridrich Weissenborn of Jekabpils (Jacobstadt), Latvia added a second manual in a swell-box. He also built a completely new console with enlarged manual compass. Although the added second manual and the lower keyboard and manual coupler has a C-f′′′ compass, the lower manual is only connected to the notes of the original manual compass—C-c′′′. The original pedal compass C-c′ was retained, although with a new pedal keyboard. The original key and stop action were left intact from the rollerboards to the windchest. The new console was traditional in its use of suspended action on both manuals.

The original pipework of the manual was rearranged on the chest to obtain wider scaling. This also resulted in some changes in the specification (see Appendix 2):

- The Bordun 16′ and Gedackt 8′ were all moved up two semitones. The Bordun 16′ had previously begun at F♯. It was later completed in 1890 with new wooden bass pipes positioned in place of the removed Trumpet 8′ bass and connected with lead tubes to the Bordun 16′ toe board.
- The 8′ Principal was left intact in the case. The pipes of the original 4′ Octave were used to recompose the Mixture whereby most of the 4′ Octave was replaced with new pipes.
- The present day Gamba 8′ consists of pipes of nineteenth-century type, of which one is signed "Freÿmann 1872." This is probably a replacement for an earlier Gamba or Salzinal 8′.
- Most of the Quinte 3′ and Octave 2′ were moved up one third. They also consist of odd pipes from the Octave 4′.
- It has been impossible to determine the composition of the 1890 recomposed Mixture, since the pipes were completely rearranged in the latest repair. However, many of the original pipes of the Octave 4′ can still be found here.[10]
- The bass of the Trumpet 8′ was removed, and the added bass pipes of the Bordun 16′ were put in its place. The treble part of the Trumpet is only partly preserved today.
- The pedal stops were left intact except for the Octavbasz 4′, which was moved up two semitones.

At the author's first inspection of this organ in 1991, the instrument was headed for repair and cleaning without any plan and documentation. Most of the metal pipes had been taken outside, washed with water, and heavily scrubbed with a brush. The professional organ builders and preservation authorities of the country later intervened to stop these measures, insisting that the pipes be returned to the organ.

[10] This organ has suffered rather badly from recent unprofessional repair.

The following conclusions and recommendations for this organ are from the author's preliminary documentation and restoration program.[11] The organ as it stands today with the added second manual is a convincing whole, since the added parts and the console are well designed and professionally built. An attempt to reconstruct this organ's original state would involve too much speculation, since there are no surviving examples of Stein/Contius consoles. It would also be difficult to motivate the parish to reduce their present two-manual organ to one of only a single manual. It is therefore suggested that the organ be kept in the state in which it stands today, albeit with some changes and slight reconstruction of the original pipework.

One of the great problems to be solved in a future restoration is pitch. The rescaling of the old pipes was probably based in part upon a desire to move the pitch down from the original choir pitch[12] to modern pitch. Attention to this will be essential in the coming restoration. The aim should always be to make as little change as possible to the original substance.

Pipes should be returned to their original positions as far as possible. This means, for example, that the 4′ Octave pipes now spread through-out the recomposed Mixture and in other stops, should be returned, while the present 4′ Octave pipes from 1890 should be stored. The Mixture should be reconstructed following examples from Liepaja and other closely related organs in Germany. When Weissenborn recomposed the Mixture in 1890, it is obvious that he had problems finding space for the larger pipes. Some of them are attached to the adjacent, later Bourdon 16′ bass pipes (fig. 12.4), and connected with long tubes to the Mixture toe board.

FIG. 12.4. *Kihelkonna organ. Pipes from the Mixture hung up on Bourdon pipes*

[11] Göran Grahn: Restoration Program 1996.

[12] The original pitch appears to have been two semitones above modern pitch.

The added bass pipes of the Bourdon 16′ should be removed and stored and the bass of the trumpet should be reconstructed following examples from Liepaja. The rest of the original pipework should be brought back as near to its original state as possible. This might require adjusting the pipes of the second manual to choir pitch—an acceptable procedure since these are common factory-made pipes.

Before the restoration, a detailed documentation should also be undertaken. As the time for restoration draws near, all these issues will need further discussion.

In view of these two case studies, a question arises about the value for organ restoration practice gained by studying and restoring heavily rebuilt organs. First, the conflict between museum ethics and practices for preservation of old organs and the needs of a parish in possession of an historic organ is obvious, both in historical retrospect and in discussions about future measures. However, the continuous use of an historic organ for centuries has great historical value in itself, providing important information for coming generations.

In contrast to stringed keyboard instruments, organs are not threatened by tension; the best way to preserve a pipe is to have it standing in the organ on its toe-board. The only wear and tear of a pipe is by tuning. Therefore, historical organs in use in parishes would need different criteria for preservation than organs kept in museums, where they have been removed from regular use. However, restrictions on playing time can be necessary for organs which are in regular use but which have historic action parts deserving of preservation. Unique organs should thus not be used for practice. We must continually educate owners and players of historic organs to use their instruments in a sensible and careful way, establishing appropriate measures for their long-term survival.

Preliminary work in the Baltic States has created new interest in the care of historic monuments such as these organs. The desire by local organ builders to study these practical and ethical issues points toward a promising future for these organs. Perhaps they will be able to avoid the mistakes made in other parts of Europe during the 1950s and 1960s.[13]

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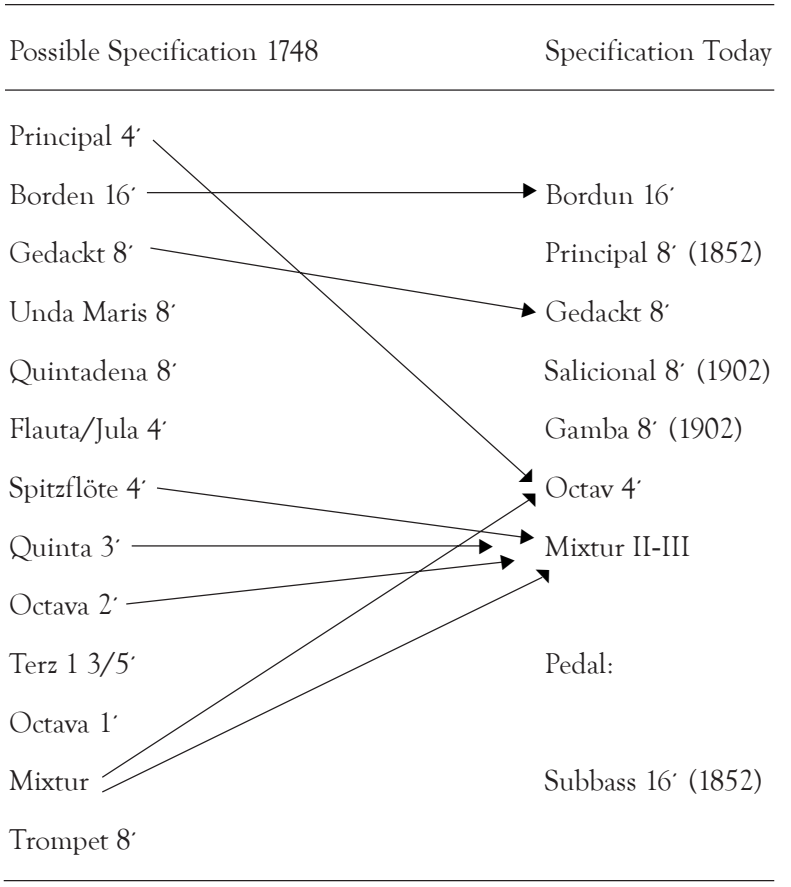
[13] Andrew McCrea and Göran Grahn, "Towards a History of Organ-Building in the Baltic States," *The Organ Yearbook* 25 (1995): 1-32; Andrew McCrea, *Pre-Nineteenth Century Organ-building History in the Baltic States* (M.Mus. thesis, University of Reading, 1996); Hillar Saha, *Easti Muusika Ajaloo Lugemik*, II (Tallinn, 1940) (in Estonian); Ilma Grauzdina, *Tukstos Melem Ergeles Spele* (Riga, 1987) (in Latvian); Paul Campe, *Lexicon liv- und kurländischer Baumeister, Bauhandwerker und Baugestalter von 1400-1850* (Stockholm, 1950), 2 vols.

APPENDIX 1

Edole

Moving Pipes at Rebuilding Work in 1852 and 1901



Appendix 2

Kilelkonna.
Changes in Specification

Possible Original Specification	Specification Index
Manual C-c′′′	**Manual C-C′′′ (coupl. to f′′′)**
Bordun 16′ from A	Bordun 16′ from C 1805/90
Prinzipal 8′	Principal 8′ 1805
Gedacht 8′	Gedakt 8′ 1805
Gamba or Salzinal 8′	Gamba 8′ (Freÿmann 1872)
Octave 4′	Octave 4′ (Greater part new 1890)
Flöte 4′	Flöte 4′ 1805
Quinte 3′	Quinte 3′ 1805
Octave 2′	Octave 2′ 1805
Mixtur III	Mixtur III 1805 (recomposed 1890)
Trompete 8′	Trompete 8′ (Bass removed 1890)
Pedal C-c′	**Manual II C-f′′′ (in swellbox)**
Subbass 16′	Geigenprinzipal 8′ 1890
Principalbass 8′	Hohlflöte 8′ 1890
Octavbass 4′	Piano 8′ 1890
Posaune 8′	Geigenprinzipal 4′ 1890
	Pedal C-c′ 1805
	Subbasz 16′
	Prinzipalbasz 8′
	Octavbasz 4′
	Posaune 8′

13

An Organized Piano by Alpheus Babcock

Darcy Kuronen

As the piano became increasingly popular in the late eighteenth century, several instrument makers constructed examples that were combined with a pipe organ, especially in England.[1] London music dealers Longman and Broderip often listed so-called organized pianos among their stock, and in 1798 John Geib claimed to have constructed about four hundred examples himself.[2] Even in America a few keyboard instrument makers produced organized pianos, but only a handful of examples are known to survive.[3] Interest in combined instruments seems to have been short-lived, though, as their manufacture dropped off considerably, beginning in the early nineteenth century.

As to exactly how organized pianos were used musically we are mostly left to guess. Various eighteenth-century sources praise both harpsichords and pianos combined with an organ for their novel tonal combinations. However, contemporary reports also indicate the difficulty of maintaining such an instrument and keeping the two components in tune with each other, in some cases leading to the permanent separation of the two parts.[4] The organ disposition of many surviving organized pianos, such as those by Longman and Broderip, is limited to a single eight-foot stop. Also, nearly all the known instruments are constructed

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Some of the material contained here was originally presented at the First Annual Symposium of the Westfield Center in Northampton, Massachusetts, October 1994.

[1] See *The New Grove Dictionary of Musical Instruments*, s.v. "Claviorgan" by Peter Williams (London and New York: Macmillan, 1984); Wilson Barry, "Preliminary Guidelines for a Classification of Claviorgana," *Organ Yearbook* 15 (1984): 98-107; and F. J. De Hen and Arthur W. J. G. Ord-Hume, "Combination Pianos," in *Encyclopedia of Keyboard Instruments: 1, The Piano*, ed. Robert Palmieri (New York: Garland Publishing, Inc., 1994).

[2] See an advertisement of 1800 quoted in Rita Susswein Gottesman, *The Arts and Crafts in New York 1726-1804* (New York: New York Historical Society, 1938-1965), 328-29.

[3] During the 1850s, Timothy Gilbert's piano manufactory in Boston produced numerous square pianos that contained a so-called Æolian attachment, which was a single rank of free reeds and bellows. However, these instruments were technically much simpler than earlier pianos combined with actual organ pipes. See John Koster, *Keyboard Musical Instruments in the Museum of Fine Arts Boston* (Boston: Museum of Fine Arts, 1994), 293-99.

[4] See *The New Grove Dictionary of Music and Musicians*, s.v. "Claviorgan" by Peter Williams, 2d ed. (London: Macmillan, 2001).

using square pianos rather than grands, suggesting that their musical applications were not overly serious. Regardless of whether instruments like these were in demand among musicians, craftsmen and inventors will often combine two mechanical devices simply for the challenge of doing so.

The Babcock instrument at the Museum of Fine Arts (MFA) in Boston (fig. 13.1) is comprised of a rectangular organ case with a square piano resting on top that can be tilted back on two massive hinges to allow access to the pipes and bellows below (fig. 13.2). By itself, the piano portion is highly significant, since it incorporates one of the earliest known examples of a one-piece cast-iron frame, an idea that Babcock himself was the first to patent in Boston on 17 December 1825. Until the discovery of this organized piano, the only other known Babcock piano with such an iron frame was one at the Smithsonian Institution, the nameboard of which indicates that it was made by Babcock in Philadelphia, during his employment with William Swift between 1833 and 1837. A third surviving Babcock square piano with an iron frame (privately owned in Rhode Island) was discovered in 1998. Like the MFA's organized piano, it predates the Smithsonian instrument.

FIG. 13.1. *Organized piano made by Alpheus Babcock, Boston, about 1829*

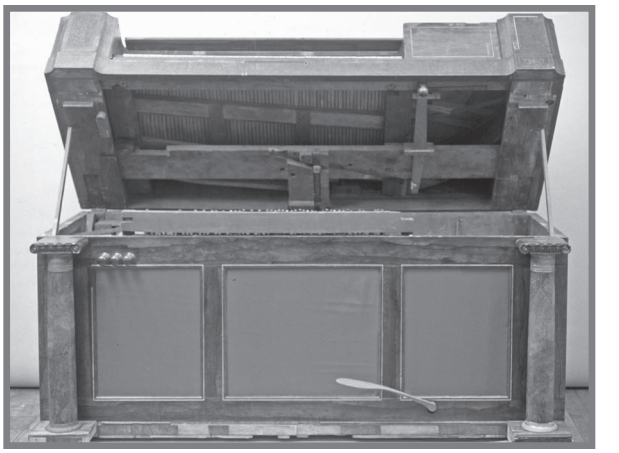

FIG. 13.2. *Piano portion of instrument tilted back for access to organ pipes and bellows*

The existing patent drawing of Babcock's iron frame was reconstructed in the late 1830s, since the original from 1825 (along with all other early American patents) was destroyed by fire in 1836 (fig. 13.3). The frame depicted in this drawing bears some resemblance to that in the Smithsonian piano, but is unlike those in either of the earlier Boston-made instruments. The most noticeable difference is in the portion called the hitch-pin plate, which in the Boston instruments curves away from the right end of the case. As in other American and English pianos made before about 1830 that use a separate hitch-pin plate of metal or wood, there is a wide area the strings must span between the bridge and the plate (fig. 13.4). In Babcock's patent drawing and the Smithsonian piano,

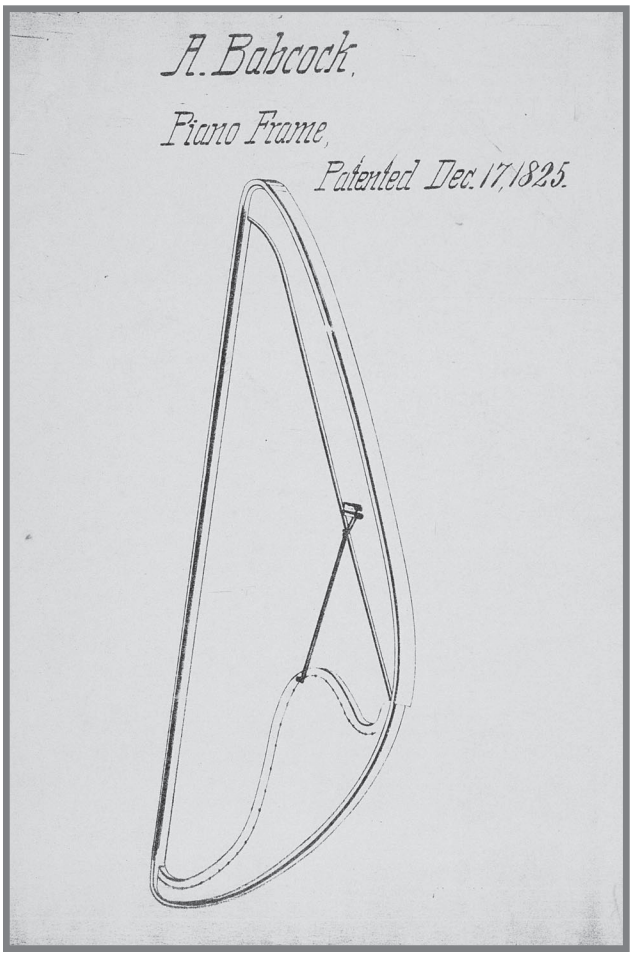

FIG. 13.3. *Patent drawing by Alpheus Babcock for a one-piece cast-iron frame for pianos*

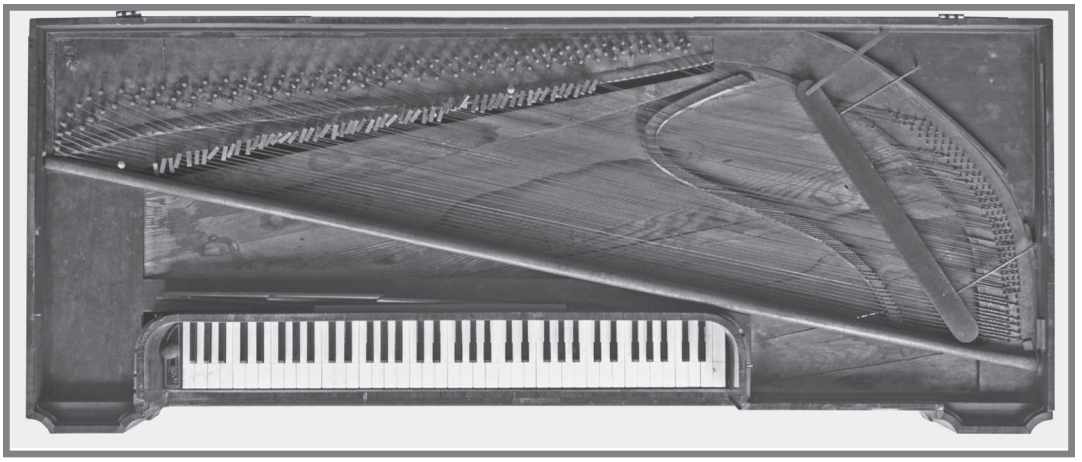

FIG. 13.4. *Plan view of instrument showing layout of cast-iron frame*

the hitch-pin plate closely follows the contours of the bridge, thereby eliminating most of this so-called after-length of the string. James Shudi Broadwood patented an iron hitch-pin plate of this same design (but not incorporated into a full iron frame) in London on 9 April 1827 (British patent no. 5485). Similar plates began to appear in American pianos soon after. One of Broadwood's specific reasons behind this style of plate was to eliminate string after-length. A long after-length usually produces a ringing sound from the strings, typically eliminated by weaving a thin strip of wool "listing cloth" through the strings in this area. Many Babcock pianos from the 1820s (including the organized piano and the Rhode Island instrument) employ a pedal to lift a cloth-padded bar from the string after-lengths to allow them to ring intentionally. William Frederick Collard patented such a device as the "harmonic swell" on 8 March 1821 (British patent no. 4542). Among American piano builders only Babcock and his Boston competitor Jonas Chickering are known to have used it (Chickering only rarely), and practical experience suggests that it is not very useful musically.

In summary, the form of the hitch-pin plates in the MFA and Rhode Island instruments strongly suggests that their iron frames represent an earlier design by Babcock than that used in the Smithsonian piano. Lacking the original patent drawing, it cannot be known if it, too, illustrated a different shape than the reconstructed one. Whatever the case, Babcock must have had confidence in his iron frame design, since in all three of the pianos that have it the thickness of the rear case wall of wood is reduced to about fifteen millimeters. This is about one-third the thickness of the walls in his instruments without iron frames, where the strength of the back is vital in resisting string tension. Wood-framed pianos must also have a strong, thick bottom to maintain a rigid structure, but the piano case of the organized piano has no bottom at all. This might have been to save weight, but may also be a further indication of Babcock's faith in iron.

There are a number of factors indicating that the Babcock organized piano was made in late 1828 or 1829. First, the piano's wood hammer heads have small pieces of lead set into their tops, a design patented on 14 August 1828 by John Mackay, Babcock's apparent financial backer at the time. The purpose seems to have been to create a slightly firmer and heavier foundation for the surrounding leather coverings. Also of interest, though less critical to the instrument's dating, is the presence of back-checks for the hammers, a very uncommon feature in Babcock pianos, but one regularly employed by Chickering and his teacher, John Osborne. The instrument's serial number (570) is the highest known of any Boston-made piano by Babcock.[5] (In one area the serial number has a five stamped over a four, but other parts of the instrument are clearly marked with a five only.) The piano also shares two features found in other Babcock instruments with high serial numbers (i.e., those numbered above about 349): a full six-octave compass from FF to f4 and the presence of Babcock's name alone on the nameboard without the inclusion of any of his financial

[5] John Koster first proposed that serial numbers used by Babcock during his Boston period are cumulative. See Koster, *Keyboard Musical Instruments*, pp. 248 and 250, n. 16. Unpublished research by the present author has substantially corroborated this theory.

backers (such as members of the Mackay family). Taken together, these facts suggest that the organized piano was one of the very last instruments made by Babcock in Boston before leaving for Philadelphia, where he is said to have arrived by the latter part of 1829.

Circumstantial evidence about the organ portion of the instrument also implies that it was made in the very late 1820s. An 1834 biography of Boston organ builder William Goodrich cites five specific instances during his career when he "organized" a piano.[6] The last of these instruments was made in 1828 or 1829 for a Boston client named Caleb Eddy, using a Babcock piano in particular. Given the rarity of organized pianos, the example at the MFA could very well have been Mr. Eddy's, and the organ part therefore made by Goodrich (fig. 13.5).

Preliminary investigation about Caleb Eddy has proven interesting in relation to this organized piano. Boston directories initially show him as a ship chandler, but beginning in 1825 he is listed as a canal agent, and for the next twenty years he served as superintendent

FIG. 13.5. *Interior view of organ pipes*

[6] See "Biographical Memoir of William A. Goodrich," *New England Magazine* (January 1834), 28, 32-33.

of the Middlesex Canal, an important transit system connecting Boston with Lowell, Massachusetts. With such a job, Eddy certainly possessed the financial means to commission an instrument as complex as an organized piano. Perhaps more interesting, though, is that Eddy was one of two witnesses who signed the 1840 patent for Jonas Chickering's one-piece cast-iron frame for square pianos, which incorporated certain improvements on Babcock's design. This may only be coincidence, but it would be interesting to know if Eddy was otherwise involved in Boston's musical instrument industry. Of related interest is that Eddy's son Robert, a civil engineer and "solicitor of patents," was a signed witness on two other Boston piano patents, one by Babcock in 1839 for an improved piano action and another in 1843 for Chickering's cast-iron frame for grand pianos.

From the beginning of the nineteenth century, William Goodrich was connected with many of Boston's other builders of keyboard instruments. In 1804 he briefly formed a partnership with Benjamin Crehore, Babcock's teacher, explicitly for the purpose of constructing organized pianos. Goodrich was also no stranger to Babcock, having worked with him and several other instrument makers at Boston's Franklin Music Manufactory between about 1815 and 1820. Barbara Owen, an expert on New England organs, briefly examined the Babcock organized piano in 1993 and concluded that the construction style of the pipes is within the workshop tradition of William Goodrich. However, she also stressed that this tradition must necessarily include William's younger brother, Ebenezer, and his brother-in-law, Thomas Appleton, both of whom learned their craft from the elder Goodrich. Although attribution of the instrument's organ works to William Goodrich may never be conclusive, there is no doubt that he is the likeliest candidate given his documented interest in organized pianos.

The Babcock/Goodrich instrument has three registers of organ pipes, the unlabeled stop knobs for which are situated beneath the keyboard at the bass end. The first is an eight-foot Stopped Diapason encompassing five-and-one-half octaves from C to f^4 (fig. 13.6). Most of its pipes are constructed of mahogany, but the lowest octave and a third are of pine. A second eight-foot register is comprised of open pipes made of red pine and cherry with lead tuning shades, running four octaves from f to the top f^4 of the keyboard (fig. 13.7). Of particular interest is that the lips in this register are cut on the inside of the pipe bodies, rather than on the outside, and the cut-ups are very low, resulting in quite soft voicing. No exact name can be determined for this register. But there are other early New England organs in which a labeled stop knob is still present for a register of pipes that was removed during later rebuilding. As some of these stop names are rather unusual, one of them may be the term that was used to denote the middle register of the MFA instrument. All the wood pipes of the two eight-foot registers survive intact, but a four-foot Dulciana register of open lead pipes is represented by only twenty-two surviving pipes of the original forty-nine, the compass being four octaves from f to f^4 (fig. 13.8). It appears that the missing pipes were removed randomly (perhaps by children who used them for whistles) during a period when the instrument was in storage.

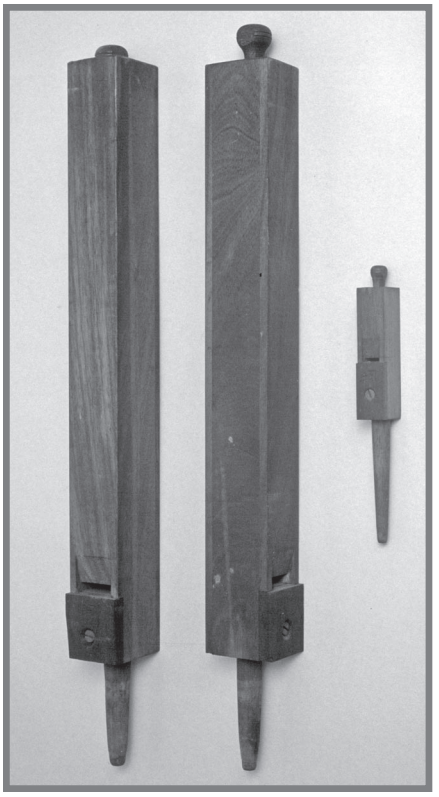

FIG. 13.6. *Eight-foot Stopped Diapason pipes*

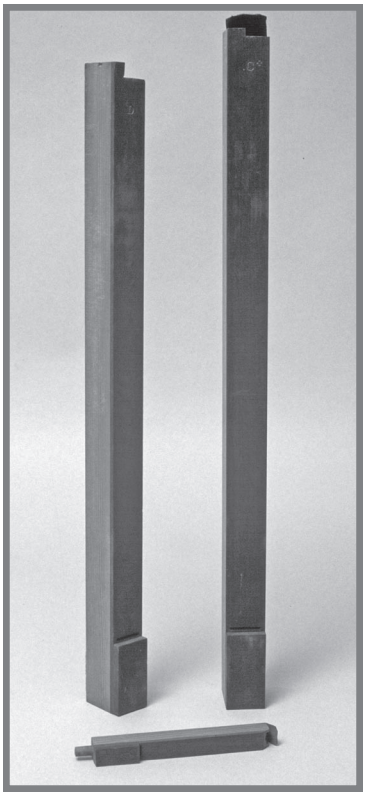

FIG. 13.7. *Pipes from unlabeled eight-foot register*

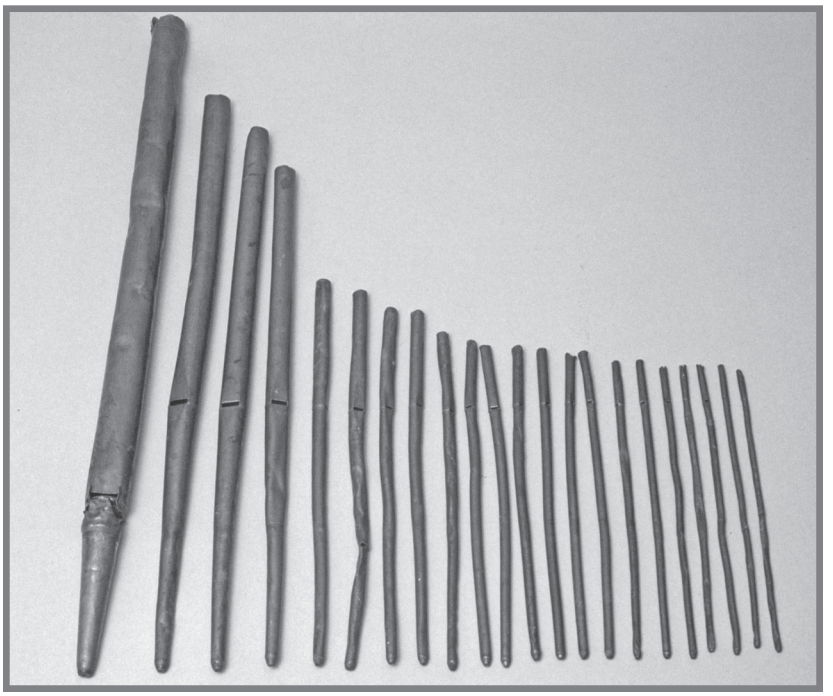

FIG. 13.8. *Four-foot* Dulciana *pipes*

There is a single-feed bellows at the right end of the organ case, which is of a type used in small organs to maximize efficiency by pumping air both when the pedal is depressed and released (fig. 13.9). A surviving iron pedal can be operated by the player when positioned at the front of the case, or it can be moved to the right end of the case for assisted pumping (fig. 13.10).

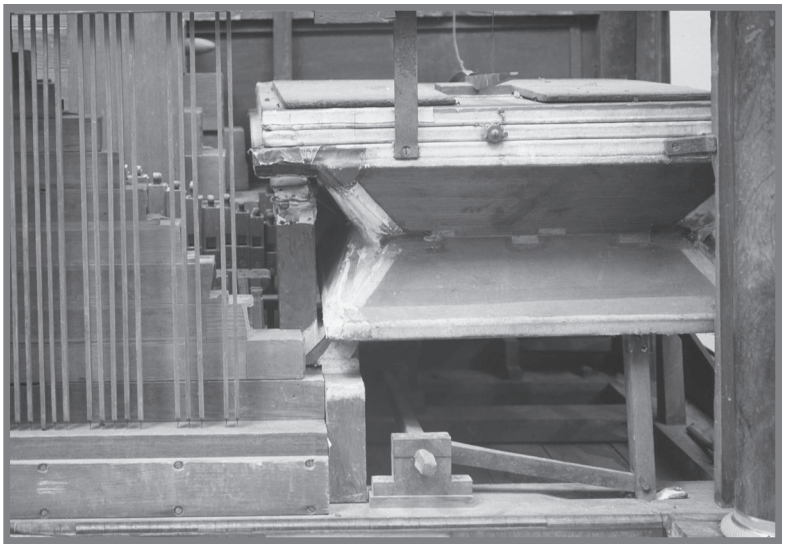

FIG. 13.9. *Bellows as seen from front of case*

FIG. 13.10. *Bellows as seen from right end of case*

Below the keyboard at the treble end is a long wood lever that allows the player to disengage the piano action so that only the organ plays. This is accomplished by forcing a rail to lift up the underhammers of the instrument's English double action. Likewise, a knob at the bass end of the keyboard disengages the organ action to allow only the piano to be played. By moving this knob, a rail containing leather-hinged stickers is pushed out of alignment with pads on the underside of the key levers, thus stopping transmission of motion to the stickers (fig. 13.11).

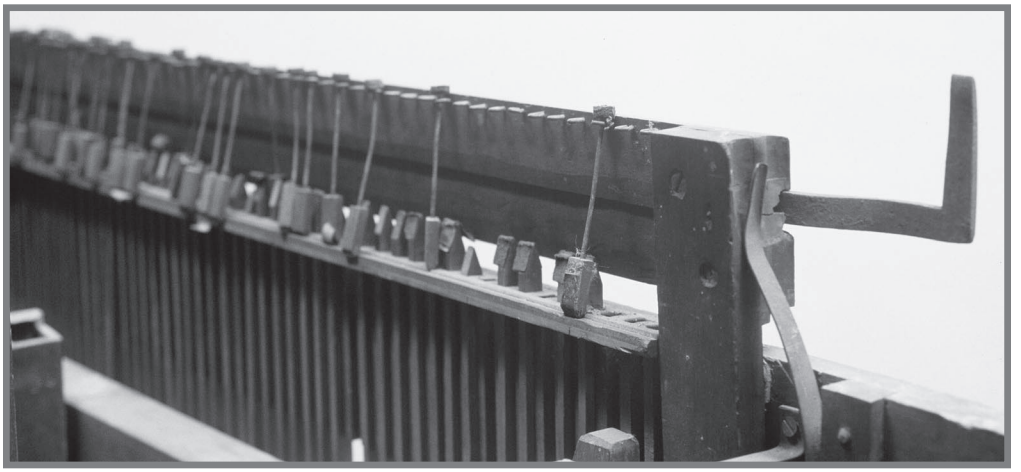

FIG. 13.11. *Wood stickers along front edge of case*

The case decoration is in Empire style, and is relatively ornate compared with much of Boston's conservative furniture of the time. Highly figured rosewood veneer is accented by foliate brass inlay on the nameboard and projecting front corners, and straight brass stringing on virtually every other surface, including the back of the case. Supporting the front corners are columnar legs with carved capitals and imported gilt-bronze mounts. The openings in the frame of the organ case were originally filled with panels of pleated silk cloth, including one in a radial pattern at the center. Such a lavish case befits the elaborate mechanisms housed inside, and would have helped reflect the owner's status.

There is evidence that the instrument was kept at least somewhat operable in the latter part of the nineteenth century. A stamp found in three places on the iron frame and casework bears the name of H. W. Berry, a piano dealer first active in Boston in the 1870s. Berry might have re-sold the instrument and/or had some minor work done to it, although there is no indication that a thorough overhaul was undertaken.

It has proven difficult to reconstruct the ownership history for this organized piano. The MFA acquired the instrument from an individual in Rochester, New York, who had discovered it in about 1989 in the town of Bethlehem in northern New Hampshire. It belonged to an antique dealer who often sold old pianos, and was considering converting

the instrument into a player organ. Thankfully, the purchaser from Rochester saw the wisdom of not undertaking such drastic measures to make it operable. Regrettably, though, the Bethlehem dealer passed away shortly before the MFA was able to contact him, and his widow was reluctant to discuss the past. Consequently, it is not known how and when the instrument came to rest in New Hampshire. It can be conjectured, however, that the instrument spent a considerable period of time in a barn or other outbuilding. The casework is quite dirty inside and out, the shellac finish has suffered considerable deterioration, and there are numerous losses of rosewood veneer and decorative brass stringing, especially along the lower portion of the organ case. Most telling of the instrument's past storage conditions was ample evidence of rodent infestation, including nests, droppings, and chewed-up corncobs. Gratefully, the damage inflicted by the rodents was minimal, consisting of some gnawing on a few pipes and other less essential wood parts.

The relative rarity and significance of this instrument mandate caution when considering what steps, if any, should be undertaken for its restoration. Since acquiring it, the MFA has been faced with concerns about how best to share it with the public. Although the instrument is clearly of great historical importance, the poor condition of its casework would belie this significance to all but the most informed museum visitor, were it on public view. The MFA makes a regular practice of restoring its musical instruments cosmetically—i.e., they are conservatively returned to a state where they may be appreciated visually. Exterior surfaces are cleaned, missing material is often replaced, and ephemeral components such as strings, reeds, and mouthpieces are put on to give the instruments a complete appearance. From the outset, this has been the intended approach for the organized piano as well.

Regarding the deteriorated state of the casework, advice has been sought from a respected furniture conservation firm in the Boston area, which supplied an estimate of the amount and type of work needed to make the instrument presentable. Particular features of rosewood cause difficulties in retaining shellac coatings, so there are considerable areas of the case where the finish is virtually gone. Although due efforts will be made to retain as much of the original finish as possible, it is clear that new shellac will need to be added in several locations to present a cohesive appearance. A thorough cosmetic restoration raises only moderate concerns, since there is little danger of losing vital information about the instrument's construction, and numerous other examples of Boston-made furniture survive from the period with original finishes.

Undertaking restoration of the organized piano's musical mechanisms would present many more complications. Both pianos and organs contain a multitude of moving parts, which often include materials that are quite susceptible to deterioration, such as leather and cloth. Even the structure of wood and iron can break down rather rapidly if not cared for properly. With many mechanical objects, it is often unrealistic to expect them to function as originally intended without the wholesale replacement of components that are worn out. Materials removed can be saved for future examination, but they can never again be studied in quite the same way as when they were attached to the main object. There

is also a real danger, even in a museum setting, of removed materials becoming separated from their original source, and then becoming lost or discarded. If all historical pianos and organs have their worn-out materials systematically replaced, there will soon be no instruments from which to draw accurate conclusions about past construction methods. Although it may be unrealistic to advocate that all antique keyboard instruments be preserved in whatever state their caretakers discover them, it seems prudent to carefully conserve the information contained in particularly rare and significant examples.

The Babcock/Goodrich instrument is an interesting instance of an early New England organ that has avoided receiving major alteration in the past one hundred and seventy years, and which therefore may survive into the coming centuries as a relatively pure example of such work. Probably the instrument's greatest safeguard is that it has become part of a museum collection, and will therefore be subjected not only to favorable storage conditions, but also objective and informed reasoning about what measures should be taken with its restoration and preservation. One of the particular reasons this organized piano has come to rest in a museum is its small size, since few such institutions are equipped to display or store even modest-sized church organs, which are often quite tall. Since it is a chamber organ, the Babcock/Goodrich instrument was probably never owned by a church, so it escaped an economic need to be updated and kept in continuous operation. Also, unlike many large organs that were essentially "built in" to a church, it avoided destruction to make way for an entirely new instrument.

The instrument's peculiarity may further serve to save it from overzealous restoration, since it would be less compelling to restore the organ component to playing condition if the piano portion cannot also be made operable. Since features in both parts of the instrument are almost equally rare and important, their inseparable presence in one unit should provide twice as much incentive to proceed cautiously. Although an organized piano is a relatively complex piece of musical machinery, it would be within economic reason to consider constructing an accurate reproduction of this instrument, provided there is a strong enough desire to experience its musical capabilities.

In conclusion, the Babcock/Goodrich organized piano at the Museum of Fine Arts, Boston, is a virtually unique instrument, which historians should be grateful has survived to present times in such an intact state. It is equally fortuitous that it has come to rest in a major cultural institution, where it can be preserved, interpreted, and hopefully displayed to the public someday soon. This fascinating instrument has much to tell us about the state of piano and organ building in New England at a time when those crafts had reached the first stages of maturity in America.

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About the Book

This volume brings together a series of essays delivered at the international colloquium "Historic Organs Reconsidered: Restoration and Conservation for a New Century," held in 1999 at the Historic St. Luke's Church in Smithfield, Virginia. With St. Luke's exceptionally rare 1630 English chamber organ as a backdrop, invited authorities from seven countries offered diverse views on musical, ethical, and historical issues driving organ restoration today. Part 1 of the book places the often-vexing issues of organ restoration in the broader context of musical instrument restoration and historic preservation, and considers the implications of emerging "forensic" examination methods for restoration ethics. Part 2 visits two conservation laboratories, providing an inside glimpse of new approaches to preservation-minded restoration. Part 3 focuses specifically on the Historic St. Luke's organ and its musical history, with attention to the organ's possible builder, its first owners, and early repertory. Part 4 offers perspectives on restoration through case studies of other historic organs in Europe and America.

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