



Addition, Subtraction, Deception and History: The Restorative Conservation of Historic Pianos

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Editor's note: This article is a companion to the document "Principles of Piano Conservation" which can be read as the PTG Foundation's contribution to this issue. Both articles are archived at my.ptg.org/foundation/steve-jellen-library/conservation.

As professional piano technicians, we each have ideals for what constitutes perfection in pianos. Our professional lives are dedicated to bringing those ideals to the pianos in our care. Against that yardstick, the phrase *historic piano* may have negative connotations for some. Pianos that did not benefit from the technological advances of the last century may seem to beg an extensive rebuilding and modernization. But consider that pianos from past eras were not first heard nor understood from the perspective of the twenty-first century. Composers optimized their music for the available instruments, and it has been profoundly illuminating for many of us today to hear old music as its composers and first public first heard it. Moreover, the technological history of our chosen musical instrument is most thoroughly encoded in the historic pianos themselves. As technicians, that historical archive is largely in our hands.

Yet most of the historic pianos coming into museum collections arrive with signs of past repairs or restoration by often skilled piano technicians whose work nevertheless diminished the informational content of the instruments. Conventional restorations, no matter how carefully, knowledgeably, or skillfully they are performed, follow a set of values that are not fully compatible with principles of historic preservation. Although the best piano technicians aspire to (quoting the mission statement of PTG) "the highest possible standards of piano service," the problem is that a so-called "historic" instrument has become



The damper padding on the rear of the keys on this 1816 Broadwood grand piano had been replaced by a restorer, leaving only trace evidence of the original leather and green wool padding. Better preservation of historical information could have been accomplished by at least leaving a few serviceable pads on the little-worn outer keys.

something more than a piano. It has also become a historic document.

When a piano gradually crosses that line and becomes a rare representative of a past era, or of a historic approach to design, or of a venerated place, maker or musician, then its value is measured in a new way. You could say some new duties are added to the piano's job description. The original makers and owners required it to be a piano: beautiful in sound, responsive in touch, and pristine in appearance. The day it left the factory, it was already a detailed physical record of the maker's methods, materials, and design ideals. The instrument then began to record on its surfaces and wear patterns an ongoing history of use, and a history of potentially auspicious connections to people and places, eventually becoming an artifact of rare cultural significance. Now, its role has changed. The instrument has stories to tell about the past.

Much has been written in the preservation literature about how to judge when an artifact deserves the type of care we call *conservation*. We will have to discuss those criteria another time. Meanwhile, the authors will use the term "historic" to refer to pianos that

have acquired special documentary value, sometimes also called "museum quality" or "cultural significance." While age is often a factor in this designation, as already mentioned, there are many other factors that may be as much or more important in some cases.

Just as there is a continuum of how "historic" a piano might be, so there is also a related continuum of how rigorous conservation measures should be. Some pianos deserve complete retirement from any further musical use, while other less rare examples may have parts replaced and the original parts preserved separately for their informational value. Where precisely a piano is on that continuum is a subjective judgment informed by experience. It is the authors' hope that the principles illustrated in this article will help us preserve a history we above all should cherish.

Much of the cultural importance of historic pianos is in the record inscribed on their surfaces, and potentially even in their mechanical adjustments, and in their patterns of wear. In recent decades, historians have begun to *read* physical evidence of these types, as if old artifacts were historic documents. In museums, the growing field of forensic science informs the ever-broadening frontiers of historical research now piecing together an astonishingly detailed picture of piano history. Tragically, some of the most valuable evidence is being polished away by well-meaning but misdirected restoration efforts.

That dual nature of historic pianos—as musical instruments and as historic documents—presents us with a paradox: The more thorough its restoration, the more a piano loses the authenticating and information-bearing evidence of its historical story.

The path through the paradox of restoration is a hybrid approach that

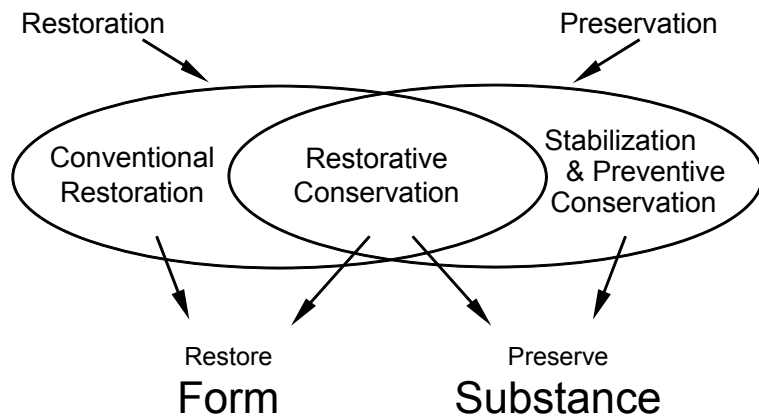


Figure 1: The goals of conventional restoration and the goals of preservation overlap in an approach to piano renewal called restorative conservation.

finds the common ground between the goals of restoration and the goals of preservation. It is called *restorative conservation* (Figure 1).

To the piano historian, every instrument is virtually a multi-volume encyclopedia about how to make a piano, authored by the firm whose name is on the nameboard. Additional volumes covering the instrument's history have been added by the subsequent owners and users of the piano. All of the information is encoded in the physical substance of the instrument, including the precise materials, dimensions, accretions, tool marks, and erosions from use. Historians skilled at interpreting the evidence are now able to derive detailed information by examining that kind of evidence.

The ultimate approach to preserving this kind of physical information is taken by some museums for their most important instruments: By completely retiring an instrument from any further restoration or musical use, all physical evidence is saved. For a few of the most iconic instruments, an accurate reproduction has been made to restore its sound in a virtual and completely non-intrusive way.¹ For historic pianos that must remain playable, however, restorative conservation is a path through the paradox of restoration.

Simply put, restorative conservation is about placing as much emphasis on preserving historical information as it does restoring musical qualities. Once

the technician understands and respects this informational content of pianos, the methods of restorative conservation become almost common sense. The remainder of this article illustrates some of the principles of restorative conservation as applied in familiar situations.

This article is *not* about the great majority of pianos most of us see in a typical week. In urging the following alternative repair and restoration methods, we are in no way suggesting they are the best practice for all pianos. However, every technician sooner or later is asked to work on a piano of particular historical significance and deserving of the specialized methods of restorative conservation.

In conventional piano restoration, thoroughness is considered a virtue, but when working with historic instruments, it may be a higher virtue to leave at least representative bits of evidence untouched. Suppose our hypothetical historic piano has worn knuckles. A historian "reading" the document might approach it with questions such as, how were the knuckles designed, what materials were used, and what kind of workmanship did the maker apply to them? If past restorers had left even a few knuckles in the less-used outer notes, the historian would get answers. If even those outer notes had been too worn to be preserved *in situ*, then a few representative samples could have been archived separately from the piano, and still at least most of the answers could be learned.

Better yet, if the original hammers and shanks had been removed to safe storage, and new ones installed in their place, that part of the instrument would have been fully restored and all information would have been saved. This was Ken's approach in 2001 when he conserved an art case Steinway at Vanderbilt Mansion, Hyde Park, NY. Original hammers, shanks, and flanges were removed and new Steinway parts were adapted for installation in the piano. The original parts were then tagged, numbered, and stored in an acid-free box in the mansion archives by the Park Service curator.

Reversibility is a useful ideal. Adhesives that are soluble are favored in conservation. If a non-reversible gap-filling adhesive like epoxy is required, whenever possible, conservators use a barrier layer of hide glue or other soluble coating on the historic surface before applying the epoxy. This renders the treatment removable.

Conservation objectives usually preclude the replacement of soundboards, whether or not they are retained outside the piano. It is worth looking again at an old but non-invasive alternative to restoring downbearing. Harpsichord technicians have found success supporting sunken bridges with a stiff compression spring from below (Figure 2). This restores downbearing, yet with surprisingly little effect on the tone. The authors are in the early stages of testing this conservation alternative.

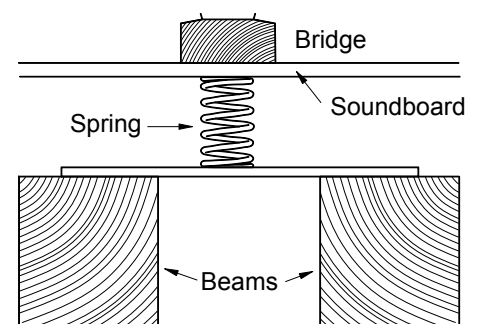


Figure 2: Is it possible to restore downbearing without damaging tone by using stiff springs under the soundboard and bridge? Early indications are encouraging that this old expedient can solve the problem while preserving the original soundboard and bridge.

Just as minimally invasive medical procedures reduce trauma to a surgical patient, so minimizing the intrusiveness of intervention reduces collateral damage to historical evidence in a piano. There are many ways to minimize the intrusions of restoration. First we must reject the idea that all signs of age constitute unacceptable damage. A visit to a museum shows how a little surface patina, including fine scratches and other signs of age, can give historic objects an air of authenticity and authority, revealing decades or centuries of use. By limiting finish work on piano casework or plate to cleaning, and treating just the more distracting scars without wiping away all evidence of age, surface evidence can be preserved.



The case finish on a 1790s Ball grand piano in this before-treatment photo is degraded but original. The grime and the smear of stray white paint can be targeted for removal without complete scraping. Then adding tinted shellac, wax, or other soluble coatings can improve appearance additively, leaving period finishing materials and other surface evidence intact.

Many condition problems that are usually solved subtractively in traditional restoration, can instead be handled additively to preserve historic material and surfaces. The previous note about improving downbearing by adding springs instead of bridge recapping or soundboard replacement is an example of an additive treatment. Old ivory does not have to be polished to a glossy shine, which is a subtractive process. Filling chips in ivory is the additive alternative to the radically subtractive recovering of the keys. Reattaching loose ribs with hide glue (note use of a soluble glue) is a good additive and reversible treatment, but drilling for screws is subtractive and unnecessary. As noted above, stripping an old finish is a wholesale loss of historical evidence.



The cotton thread in this 1857 Steinway grand piano had become too weak to function. By simply tying a loop knot around the hammer, it was possible to avoid drilling the hammers for new thread. This is an effective but additive and reversible treatment.

A difficult lesson for most of us to learn is that restoration to newness is, for a historic instrument, an attack on its historical essence and content. Yet there is much that can be done to address condition problems without losing preservation-worthy evidence and acceptable signs of age.

Finding additive, reversible, or minimally intrusive alternatives to common restoration steps is a creative process. Rather than modernizing an old Steinway pitman, which usually involves drilling holes for guide pins, think about an additive method, such as gluing sockets of layered leather to the trapwork lever and underlever tray to keep the pitman from binding in the worn bushings.

An Erard grand piano once owned by Prince Albert and now in the Smithsonian collection had severely worn hammers. Ken developed a method using long-fiber beaver fur hat felt as a thin but durable outer layer. This was an additive conservation approach that restored tone and saved the original hammers. The treatment is detailed in the Journal (June 2008, pp 18-20).

Pinblock replacement is a radically subtractive procedure. Among the great successes in piano conservation is an additive treatment that avoids replace-

ment. Using low-viscosity epoxy, the old block can be consolidated *in situ*. At the suggestion of Bill Garlick, the treatment was first developed by Ken. He described the process in the Journal article titled “Epoxy Consolidation: An Alternative Method for Restoring Piano Pinblocks” (April 2009, pp 22-25). This is not a reversible treatment, but it restores pin tightness while preserving the original pinblock and all associated historic workmanship. It also takes considerably less time than pinblock replacement. None of the pinblocks so treated have failed since Ken’s first one over 30 years ago.

Components that are considered disposable in ordinary pianos are part of the historic substance to be preserved where possible in historic instruments. If original strings have to be replaced, they, or at least portions of them, can be stored as a record of their metal alloys and workmanship of loops and wrappings. It is not necessary to replace intact original tuning pins in a historic piano if additive steps can be taken to compensate for looseness.

Sometimes conservation measures take less time than conventional methods. However, when the instrument is historic and deserving of preservation-



The lead weights in this 1831 Newman (Baltimore) square piano are corroding and splitting the key levers. In this example of inherent vice, it is best for preservation to remove and replace the weights. Scratching a date in the new lead identifies it as a replacement.

mindful treatment, a little extra effort may be required for some steps. We can, for example, preserve original tuning pins and their tightness in the block even during restringing by forming tuning pin windings on a dummy pin and leaving the tuning pins in the pinblock when the situation calls for such a measure.

Restorative conservation methods seek to reduce the replacement of original parts, but sometimes it is an act of preservation to remove original materials that are actually causing damage by their presence. Some pianos have corroding key leads. As the weights expand, they convert to toxic lead oxide powder and cause dramatic splitting of the surrounding wood. When an artifact turns destructively on itself, conservators call it *inherent vice*, and it may be an act of preservation to remove the original but offending material.

Even a drop-action spinet piano can be culturally significant, such as the

Wurlitzer spinet known to us. Now in a museum collection, it was once owned by a much venerated jazz musician. The problem of disintegrating plastic elbows in drop actions is familiar. Replacing them is necessary, but in this case, preservation objectives are served if at least one of the original elbows can be removed without too much damage and retained as a record of the original design and material.

The practical implication of the piano as historical document is that its physical substance should be as genuinely original as possible. If it is, then a future historian can put a key button or a hammer shank flange under a microscope and know he is seeing evidence of the original maker's manufacturing technology. If we have replaced those parts in our restoration, and especially if we have done so in careful imitation of original work, then the historical document is falsified and our historian misled.

This can happen most innocently but deceptively if we swap in a part from a junker action of similar date and maker. Indeed, even the most careful restorative conservation could involve at least some replacement of parts, begging the urgent question: How can we keep the historical record clear and truthful in such instances?

There are at least three methods we can use to avoid deception in restoration. (1) Create a written and photographic conservation report that details all restorative alterations that were made to each affected component and surface. (2) When a replacement part is large enough to do so, mark it indelibly and discretely with a date, choosing a location that will be noticed by a future researcher. (3) Leave intentional clues of your work so that it will be recognized as a replacement part, possibly in the choice of material or the type of tool marks, or other attributes that make the part not completely blend in with original parts if viewed closely.

So far, all of this has been the avoidance of alterations, and indeed some restorative conservation involves undoing misguided restorations of the past. In some cases, however, the past restorations could be as historic as the instrument itself. This can be a difficult judgment, as in the case of an 1814 Clementi grand piano formerly in the collection of the Metropolitan Museum. It had been restored in 1909 by Arnold Dolmetsch,



(before treatment)



(during treatment)



(after treatment)

Replacing some missing veneer on this 1831 Newman square piano in the Colonial Williamsburg collection meant fitting new veneer to the ragged edge of the remaining old wood. After color-matching and adding finish to the new portions, the repair blends with the old without any loss of old material. Leaving the seam ragged helped to disguise the repair unless examined closely. This was an additive treatment that preserved original material.

one of the founding fathers of the early music revival and an important historic figure himself.² The alterations by Dolmetsch now commemorate the historic restorer but also render the instrument unable to fully represent the 1814 work of an equally historic piano maker, Muzio Clementi. Conservation projects often require discussion with owners and other stakeholders in order to

avoid destroying potentially important historic workmanship. In the case of the Clementi piano, Ken replaced the heavy Dolmetsch-period hammers to restore the original touch, but left the twentieth-century additions to the piano's bottom and internal structure. All work was recorded in the treatment report.

For much more about the conservation of keyboard instruments, see

John Watson's book *Artifacts in Use: The Paradox of Restoration and the Conservation of Organs* (<http://aiu.preservation-theory.org/>). Although the book uses pipe organs as the primary case study, all the principles and most of the methods described are equally relevant to pianos.

The authors thank Tom and Michelle Winter for their help with this article. ■

¹This approach has been taken by the Colonial Williamsburg Foundation with their 1766 Zumpe square piano and by the National Music Museum in Vermillion, South Dakota.

²The instrument is now owned by Washington & Lee University in Lexington, Virginia.

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