

TRANSLATOR'S PREFACE

A few years ago, when I first read Claude Montal's *l'Art d'Accorder soi-même son piano*, I was particularly struck by the immediacy of his writing style. Here was someone speaking to me across a span of over 150 years, yet the experiences he was describing were precisely the same as my own, as a working piano tuner and technician. The differences lay mostly in the fact that, where I might face a spinet upright piano of the 20th century, the sort of inexpensive instrument Montal would usually have serviced was a small square piano without escapement. Piano designs had changed, but the procedures and experiences remain very familiar.

I became intrigued with Montal's life, and was more and more impressed as I was able to piece together his biography. Born in 1800, he was left completely blind by a childhood illness but continued to actively play with his friends and attend school. His father was a saddlemaker, and young Montal learned to use the tools of that trade, manufacturing various items that he was able to sell. When he was 16 years old, his parents managed to get him admitted to the National Institute for Blind Youth [Institut National des Jeunes Aveugles] of Par-

is, a progressive institution that took the education of blind people seriously, trying to give them skills and knowledge to become contributing members of society and to live relatively normal lives.

Montal was an apt student, and by the age of 20 he had become a teacher at the Institute, of such subjects as grammar, geography, and mathematics. Though he then seemed destined to spend his life teaching at the Institute, such a life was not for him. An earlier student had managed to learn to tune pianos, and was successful in making a decent living at that trade, so Montal set out to learn those skills, at the same time teaching himself to dismantle and repair pianos. He hired someone to read to him everything he could find about the theory and practice of tuning, and soon had developed his own method of setting a temperament, based, as he liked to put it, on both theory and practice.

At the age of 30, Montal left the Institute and set off to make his living as an independent piano technician. He soon branched out into other areas, teaching classes in piano tuning at a piano store, and buying, repairing, and reselling used instruments. His tuning classes became the basis for a short book about tuning, *Abrégé de l'art d'accorder soi-même son piano* [*Manual of the Art of Tuning Your Piano Yourself*].¹ This he sold at the Paris Exposition of 1834, and two years later expanded it into a much longer, more detailed work. Meanwhile his piano-repair business was evolving into the manufacture of new pianos. He began with one helper in 1833, and by 1839 he had 13 employees and had completed 175 instruments. (The Montal firm continued for several years after his death under his successors Tessereau and Donasson.)

By 1839, Montal was exhibiting his own pianos at the Universal Expositions of Paris, showing off his own, patented in-

¹[This book was published under the same title as his later, much longer book: *l'Art d'accorder soi-même son piano*. He added the words “*Abrégé de*” (literally “*Abridgement of*”) to the beginning of the title to distinguish the two. I have rendered it as “*Manual of . . .*” —Trans.]

ventions in piano and action design. He aspired to be one of the foremost piano manufacturers of his day, and over the next two decades he made considerable progress toward that goal, earning many medals and other awards, including the coveted Legion of Honor—presented, as he proudly reported, by the Emperor of France himself.

Shortly before his death, in 1865, Montal decided to revise his book, which had been the authoritative text on piano tuning and repair from its first publication, but which, in the ensuing decades, had become dated and somewhat obsolete due to changes in piano design. His revision took those changes into account, especially the transition from the square to the upright piano as the dominant form. The 1865 edition is the basis for this translation, but in footnotes and appendices I include material from the original edition of 1836 whenever it is of significant interest in revealing how the piano developed during the intervening years—three decades that were definitive in the evolution of the modern instrument.

Further details of Montal's life appear in Chapter 21, where he inserted excerpts of biographical studies of him published during his lifetime, as well as in his own Appendix, which is devoted largely to his career as a piano manufacturer.

Translation Issues

Montal wrote in a rather idiosyncratic manner that in some sections contains elements of the florid formal style of the 19th century, but in others is informal and direct. Sentences are often enormously long, with dependent clauses added to dependent clauses, and there are many inconsistencies; e.g., his various systems of listing the steps of repair procedures. Some of these characteristics stemmed, no doubt, from the fact that he dictated the book, and relied on others to do the practical work of editing and layout.

In creating this translation I have tried to balance a number of aims. I have sought to be as true to the original as possible, while at the same time smoothing over awkward constructions

and making obscure passages more easily intelligible. I have retained some of the 19th-century flavor while somewhat modernizing the style to increase readability. Above all, I have tried to retain Montal's own voice as I hear it in my mind's ear—the voice of a direct and persuasive person who wants very much to share his enthusiasm for everything about the piano.

Montal's Approach to Tuning

When Montal wrote his book, very little was available in print on the topic of piano tuning, and almost nothing describing repairs and maintenance. The theoretical background of tuning was confined to works written by and for scholars, and was not very accessible to someone who wished simply to learn to tune. The various manuals on tuning available in France at the time, all of them brief and many filled with errors, are described in Montal's introduction. Typically they consisted of a string of fifths to be tuned to one another, sometimes with rudimentary "test chords." Other, similar manuals were available in England and Germany, though these were probably not available to or known by Montal.

Montal set out to explain, clearly and in detail, everything a prospective piano tuner, amateur or professional, would need to know, beginning with the basics of scales, chords, and harmony. His approach to setting equal temperament—"partition," as it was called at the time—is particularly noteworthy, as it was developed from his practical experiments in teaching himself to tune, then refined over a period of years when he taught others his method. Quite different from any procedure then available in print, it was far more detailed and more carefully explained. Earlier manuals simply gave a series of notes to be tuned, with a brief description of what to listen for; Montal began by offering a series of pragmatic exercises to train the ear.

Montal's first step is for the student to learn the sound of "just" (pure, beatless) intervals, the main focus being on fifths and major thirds. These two intervals are then combined to

form chords, and the student is to learn the sound of just chords in all inversions. The other just intervals—fourths, minor thirds, major and minor sixths—are created during this process, so their sound is also available to be heard.

The next step is to learn how to “temper” (detune in a controlled way) these same intervals so that the octave will be divided into 12 equal parts. One of the basic problems of temperament is the fact that three just major thirds, stacked on top of one another (“contiguous”), fall short of an octave by a significant amount. Montal asks his students to begin by learning to tune just major thirds, and then to discover, by practice and aural judgment, how wide major thirds have to be made so that three will fit evenly into an octave. They are to make all major thirds equally wide, “false but tolerable to the ear”—the result will be equally tempered major thirds. This is a judgment based on perception of “out-of-tune-ness,” rather than a comparison of beat rates. Montal was quite aware of beats, and described them in the tuning of unisons and octaves, but did not mention them in reference to tuning thirds.

When the student’s ear can recognize and produce the equally tempered major third, the size of the fifth is addressed. A series of four just fifths generates a major third wider than the equally tempered third, an experiment the student is asked to execute. Each fifth is then to be made narrow enough that a series of four fifths will produce the false but tolerable equally tempered third. And finally, based on these tempered thirds and fifths, chords are tuned and played in all inversions, to accustom the ear to the sound of equally tempered chords.

Once the ear has learned to recognize false but tolerable chords, it is time to learn how to divide the octave into 12 notes in the procedure called partition. The process of executing a partition is laid out in great detail, with many proofs along the way: chords and intervals to play to ascertain that all is going well. Having presented his partition, Montal proceeds to describe a “counter-partition”—a partition laid out in reverse, to help in correcting any errors that may have arisen during the initial partition.

Montal's method is meticulous, and capable of producing a very close approach to equal temperament, as I have found from my own experimentation. On my first attempt, trying to follow the instructions as literally as possible, listening only to the quality of the chords and intervals and ignoring beat rates, I produced a temperament that scored 90% on an emulated Piano Technicians Guild tuning exam (80% is a passing grade). Subsequent trials have yielded varying results, but have always produced a musically acceptable tuning.

At the end of the main text, Chapter 22, "Acoustics," gives a full mathematical account of the basis for equal temperament, with a detailed explanation of how the mathematics corresponds to Montal's method of tuning. As Montal was fond of saying, because he was well trained in mathematics and music before he learned to tune, he was uniquely qualified to join the theoretical with the practical in developing his tuning method.

In Germany during this period, Johann Heinrich Scheibler had developed a very different method of setting equal temperament. He calculated very precise mathematical frequencies for all notes, and suggested using the interference between frequencies, commonly called beats, to tune. His initial instructions were for the organ, where beats between fifths could be counted with precision over a period of 10 seconds, feasible since the organ can sustain as long as necessary. Because this was not practical for pianos, Scheibler proposed the use of a series of 12 tuning forks each precisely tuned so as to be flat of its target frequency by the same number of cycles per second. To use these forks, the tuner set a metronome to a particular speed and would tune the appropriate string so that it beat precisely four times for each metronome tick.

Scheibler's method, rather complicated and cumbersome both to understand and to execute, was explained and promulgated in books published by Johann Loehr and J.G. Töpfer in the late 1830s and early 1840s, contemporary with the first edition of Montal's book. Considering the difficulties of using Scheibler's method in practice, it is not surprising that Montal's earlier, brief book outlining his tuning method, published

in France in 1834, was immediately translated into German and published in Germany in 1835, where it remained in print for many years.

Scheibler's mathematical approach led directly to the tuning methods that became predominant in England and the United States, based on precisely calculated beat rates between various intervals. Students of tuning are expected to learn to distinguish beat rates for major thirds in the range of about 6 to 12 beats per second (commonly calculated and presented to the accuracy of $\frac{1}{10}$ beat per second), and to be able to adjust notes in the temperament so that the beat rates progress evenly as one moves up the chromatic scale. This approach is very difficult for many students, and it might well be that Montal's method would be helpful to many prospective tuners of today. Montal believed firmly that anyone could learn to tune a piano, and his meticulous explanations are aimed directly at the beginner.

For those who wish to create an authentic 19th-century tuning, Montal's method can be recommended as one of the most widely disseminated during that era. It was certainly predominant in France for many decades. In addition to its availability in German, Montal's early book on tuning was later published in other European languages, including Czech and Dutch.

Repairs and Maintenance

Montal was not the first to include instructions for repairs and adjustments in a book about piano tuning, but he was certainly the first to present such a comprehensive and detailed account. Earlier books including such material were mostly in German; very little was available in French, as it was expected that piano owners would contact the maker of the instrument for any needed service. However, because Montal believed that every piano owner should understand the instrument, and be able to tune it and remedy the most common problems, his instructions are written with the novice in mind. Every step is de-

scribed in a vivid way, and aimed at those who have next to no prior knowledge and experience.

Major sections deal with the replacement of broken strings, and methods for dealing with various problems that arise in the moving parts of the instrument: broken parts, squeaks and clicks, sluggishness, etc. In addition, Montal includes procedures for re-covering hammers with leather or felt and repairing splits in the soundboard or bridges, as well as topics as diverse as where in the house a piano is best placed, and step-by-step procedures for packing an instrument in a crate when it needs to be moved a long distance by land or by sea.

Within all this material are descriptions of the many piano designs of Montal's time—a far greater variety than in ours—that provide us with firsthand accounts of those instruments from the perspective of someone who was engaged in maintaining them.

Piano History

In his original edition of 1836, Montal included a long appendix on the history of the piano that for many years thereafter was cited as one of the most complete accounts available. His description of the piano's predecessors—the organ, harpsichord, and clavichord—and of the early development of the piano, are very competent for the time, though somewhat flawed by today's standards. But his detailed report of developments during the early decades of the 19th century provide a fascinating and vivid picture of a period of invention and experimentation that laid the groundwork for the modern piano and foreshadowed design changes that would be implemented much later.

Among the inventions and experiments Montal documented are laminated soundboards, various attempts to make tuning easier by means of adjustable machine screws, the early use of iron to strengthen the case, and a number of improvements in action design, including an early account of Érard's invention of the double-escapement action. The details presented make

it clear that Montal was very well informed, and must have had personal contact with a great number of piano makers and others involved in the trade.

When Montal revised his book in 1865, he omitted the appendix on the history of the piano (it is included in this translation as Appendix E), saying that so many changes had occurred in the intervening years that it would be impossible to cover them all. However, he did, within the main text, give a very good idea of the major changes that had occurred. In his discussion of piano strings, for instance, he noted that they had changed considerably in manufacture and strength, and provided conversion tables for strings of different origins; in his account of hammer-covering procedures, Montal gave information concerning the conversion from leather to felt as the preferred material; and in his accounts of repair and regulation methods, he described various improvements in action design.

Montal and Blindness

It is against the backdrop of his blindness that we can most fully appreciate Montal the man. His accomplishments were remarkable for any person, let alone the son of a lower-class laboring family. But when we add the factor of his blindness, it becomes clear that Montal was a truly extraordinary man, one with an indomitable spirit, boundless energy, and a degree of intelligence that deserves use of the word *genius*.

The mere fact that he was able to leave the protective environment of the National Institute for Blind Youth and, without any real support, set himself up independently as a successful piano tuner is remarkable in itself. But, as we know, Montal was not content with that. Within four years he had begun giving public classes in tuning, had written and published a short but very detailed book on the subject, and had established a business providing piano repair, sales of used instruments, and the beginnings of piano manufacture.

Within the next two years Montal had researched, written, and published the first edition of this book—a monumental undertaking. To do this, he needed to find out about the available published materials, obtain them, and hire someone to read them to him. He must have gotten to know a large number of piano manufacturers and spoken to them at great length. He obviously tuned and repaired a very wide variety of pianos, to have been able to get to know their idiosyncrasies and be able to describe them in such vivid detail. And, holding all this information in his mind, he was able to then dictate it, and give instructions for the preparation of illustrative plates of excellent quality and detail.

Six years later, Montal was married, had obtained his first patents, was exhibiting his pianos at the quadrennial Paris Exposition, and was beginning to earn the respect and admiration of his fellow piano manufacturers. His inventions were detailed and well executed. Having perceived the advantages of the Érard double-escapement action, he proceeded to develop multiple versions for upright pianos, as well as alternate designs for the grand. He experimented with the use of rolling bearings in the action to reduce friction. His ability to conceive of minutely detailed designs, and see them through the process of development to the point at which they could be patented, is astonishing.

In later years, Montal designed a transposing keyboard that was far more reliable than its predecessors (rather than shift the entire action, it raised the action and shifted the keys under it). He devised a system of adjustable metal bars for the back of the piano, to provide additional support and to allow for changes in the dimensions of the case and soundboard due to climate. He saw the usefulness of the Boisselots' 1844 invention of the sostenuto pedal, adapted it with his own improvements, and was the only manufacturer to provide this function prior to Steinway's reinvention of it in the 1870s.

Montal's piano warerooms were a center of activity, where concerts and lectures took place regularly. He knew all the leading figures in the French musical community, and was ac-

tively engaged in everything having to do with pianos. He also played an important role in the establishment of the first standard pitch, the Diapason Normal of A-435, as he relates at some length in Chapter 5.

Perhaps Montal's most lasting legacy was the establishment of the profession of piano technician as a skill particularly appropriate to blind people. He worked closely with the National Institute for Blind Youth in establishing a training program that has continued up to the present day and has been imitated around the world. In the 1860s, it was an intensive three-year program of study with some 250 students. Montal was tireless in promoting the employment of this program's graduates by his fellow manufacturers, noting that they were the only tuners who had actually been trained to understand the theory behind their practice. He was adamant in his opinion that blind students should learn to use tools of all sorts, so as to be able to make many of the necessary repairs and adjustments as well as tune.

The History of Montal's Book

From the very beginning, Montal's book was very successful. His initial, shorter book on tuning sold out quickly, and spread to central Europe. The expanded book of 1836 also sold very well, to the extent that a second printing was produced in 1839 (called the second "edition," though no changes were made), and received very positive reviews, which Montal documents in his appendix. That book remained in print until the revised edition of 1865, on which this translation is based. Its reach seems to have been international, as Montal felt the need to insert in the 1865 edition a chapter laying out a temperament sequence starting on C, that being the note used as the starting point in England and parts of Germany. (His original sequence started on A.)

A number of other books on piano tuning and repair were published in Europe during this time span (1834–1865), but they were shorter and far less detailed. There seems to be little

room for doubt that Montal's was both the most basic and the most comprehensive text on the subject during the middle of the 19th century, and that it was authoritative for its time.

In sum, *The Art of Tuning* provides us with a vivid picture of the piano of 150 to 180 years ago, and documents the changes in the instrument during one of its most formative periods. Its detailed accounts of the repair procedures of the time may be particularly useful for those involved in historic restoration, but will also be of interest to anyone involved in piano work. And Montal presents an approach to tuning that is unique and very approachable.

But perhaps most important, this book contains within it traces of a remarkable man who was extraordinarily intelligent, energetic, inventive, and endlessly curious—a man who has a good claim to be considered the founding father of the profession of piano technician. Montal's personality is revealed through his words; in reading his book, we come to know him.

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