RICE UNIVERSITY

Perspectives of Violin Pedagogy: A Study of the Treatises of Francesco Geminiani, Pierre Baillot, and Ivan Galamian, and a Working Manual by Jonathan Swartz

by

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ABSTRACT

Perspectives of Violin Pedagogy: A Study of the Treatises of Francesco Geminiani, Pierre Baillot, and Ivan Galamian, and a Working Manual by Jonathan Swartz

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This paper presents an original working manual for violinists, building on selected pedagogical principles from eighteenth-, nineteenth-, and twentieth-century violin treatises. The pedagogical method at the heart of this manual is the conceptualization of various techniques by means of mental models. The idea or image of “hanging” the fingers of the left hand from the strings of the instrument is one such model whose purpose is to ensure a relaxed and flexible left-hand technique. Through the exploration of earlier treatises—those of Francesco Geminiani (1751), Pierre Baillot (1835), and Ivan Galamian (1962)—this paper illustrates continuity in the development of violin technique from the eighteenth century to the present day. At the same time, there is a fundamental progression in violin pedagogy demonstrated by these treatises that informs the approach taken here: earlier treatises simply provide brief statements of what the violinist must do, whereas later treatises, Galamian’s in particular, present more detailed descriptions of the physical actions of violin playing while also exploring the correlation between the mind
and the muscles. Mental models are used throughout this manual to facilitate that correlation between the mind and muscles by suggesting easily graspable images that in turn effect a desired result in technique.
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# Table of Contents

Introduction: A Modern-day Perspective on the Violin Treatises of Francesco Geminiani, Pierre Baillot, and Ivan Galamian  
Francesco Geminiani: *The Art of Playing on the Violin*, Opus 9 (1751)  
Pierre Baillot: *L'Art du violon* (1835)  
Ivan Galamian: *Principles of Violin Playing & Teaching* (1962)  

Working Manual  

Chapter 1: The Bow-arm  
- Using the Bow  
- Producing Sound  
- Vertical and Horizontal Components  
- Arm-weight  
- Holding the Bow  
- Transfer of Weight: The Role of the Fingers  
- Resistance  
- The Relationship Between the Bow-stick and the Bow-hair  
- Vertical and Horizontal Components Relative to the Plane of the String  
- Elbow Level  
- String-crossings  
- Elbow Movements: Initiating the Down-bow  
- Elbow Movements: Hinge  
- Détaché  
- Principles of Weight, Speed, and Sounding-Point  
- Additional Bow-strokes  
- Spiccato  
- Ricochet  
- Martelé  
- Up-bow and Down-bow Staccato  
- Three-note and Four-note Chords  

Chapter 2: The Left Hand  
- Stopping the Strings  
- Natural Hand Position  
- Fingers on the Strings  
- Finger Action  
- Finger Postures  
- Intonation  
- Shifting: Understanding the Shift  
- Shifting: Understanding the Mechanism  
- Supination  
- Extensions  
- Balancing the Hand to Support the Fingers
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vibrato</td>
<td>84</td>
</tr>
<tr>
<td>Harmonics</td>
<td>89</td>
</tr>
<tr>
<td>Trills</td>
<td>92</td>
</tr>
<tr>
<td>Left-hand Pizzicato</td>
<td>93</td>
</tr>
<tr>
<td>Conclusion</td>
<td>94</td>
</tr>
<tr>
<td><strong>Appendix</strong></td>
<td>96</td>
</tr>
<tr>
<td>Figures 1-6</td>
<td>97</td>
</tr>
<tr>
<td>Figures 7-12</td>
<td>98</td>
</tr>
<tr>
<td>Figures 13-18</td>
<td></td>
</tr>
<tr>
<td>Figures 19-24</td>
<td></td>
</tr>
<tr>
<td><strong>Select Bibliography</strong></td>
<td>100</td>
</tr>
</tbody>
</table>
Introduction: A Modern-day Perspective on the Treatises of Francesco Geminiani, Pierre Baillot, and Ivan Galamian

The violin and bow have been in existence for over four hundred and fifty years, achieving their present-day form during the eighteenth century. Treatises intended for the advanced violinist have been written dating back two hundred and fifty years, comprising more than twenty significant publications and countless other lesser known methods and manuals.¹ Each new generation of violinists has furthered the development of violin technique, bringing new perspectives to bear upon the work of their predecessors. In many ways, the overall technical level of the average professional violinist in the twentieth century was higher than it had ever been.

Today, it is hard to imagine anything new that will significantly alter the execution of traditional violin techniques; but as in generations past, there still exists a desire to improve, no matter how advanced violin technique has become. Over the years, improvements to violin technique have come in many forms, ranging from a change in the executions of techniques, to better descriptions of the executions and/or applications of techniques. Present-day violinists have the most advanced codified violin technique passed down to them from their immediate predecessors; in addition, modern scholarship has unearthed, studied, and published historical violin treatises, enabling further study today. This abundance of information provides a perspective on how violin technique and pedagogy have changed, as well as what commonalities exist from generation to generation.

This paper will examine three violin treatises from the past, one from each of the eighteenth, nineteenth, and twentieth centuries, with the purpose of understanding the contributions of each work and how these pertain to modern-day violin pedagogy. Through the exploration of these works, this paper will show a general progression, from one century to the next, of the pedagogues dealing more comprehensively with their material, and of their respective instructions moving from what to do, to how to do it, culminating in the twentieth century with the exploration of the relationship between the mind and the muscles, taking violin expertise to a new level. Finally, this paper will present a working manual for violinists, addressing violin pedagogy from a twenty-first-century perspective, presenting a different way of conceptualizing violin technique.

It is not the intention of this paper to trace the development of violin technique to the present day; rather, it will show the contributions of the selected treatises and how violinists today may benefit from their study. It will also show how each pedagogue addressed what he felt was deficient in early works. The treatises of Francesco Geminiani (1751), Pierre Baillot (1835), and Ivan Galamian (1962) have been chosen for study as best representatives of their respective eras.

During the eighteenth century, the Italian school of violin playing was largely responsible for the development of violin technique. It was founded on the teachings of Arcangelo Corelli, of whom Francesco Geminiani was a student. Geminiani’s treatise,

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The Art of Playing on the Violin (1751), is most appropriate for the purposes of this paper, since it reflects the teachings of the Italian school and is one of the first treatises written intended for the advanced violinist.

The French school emerged at the turn of the century as the most influential place for violin study with the creation of the Paris Conservatoire. Rodolphe Kreutzer, Pierre Rode, and Pierre Baillot, each sought to codify principles of violin playing, inspired by the playing of Italian violinist Giovanni Battista Viotti. Baillot’s treatise, L’Art du violon (1835), is representative of teachings of the three, establishing the French school of violin playing. Violin historian, David Boyden, calls this work “perhaps the most influential violin treatise of the nineteenth century.”

A product of the French and Russian schools, Ivan Galamian had arguably the greatest influence on twentieth-century violin playing. The sheer number of professional violinists who studied with him or with one of his students speaks volumes of his impact in the twentieth century. Galamian reflects an amalgamation of ideas that some might consider to represent a twentieth-century American school of violin playing. His treatise, The Principles of Violin Playing & Teaching (1962), was innovative in explaining how the relationship between the mind and the muscles affects the executions of techniques, and his teachings are largely responsible for increasing in the overall level of violin playing today.

The treatises of Geminiani, Baillot, and Galamian provide a glimpse at the development of violin technique and pedagogy from the earliest comprehensive writings

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to the present day. Each of them is a valuable source for insight into the philosophy and practice of their respective time periods; moreover, there are aspects of each that pertain to modern-day pedagogy. Although violin technique has changed over the years, a closer study of these works reveals continuity in the development of violin technique and sheds light on their value for study today.

Francesco Geminiani: The Art of Playing on the Violin, Opus 9 (1751)

Despite its acknowledgement as “one of the first mature expositions of violin playing” and “[his] most highly regarded work,” Francesco Geminiani’s *The Art of Playing on the Violin*, Opus 9 (1751) receives consideration today mainly as a source of historical interest only, serving as an example of violin playing and pedagogy in the eighteenth century, and valued for its insight into the past. The facsimile publications of this work of 1952 and 2001 are attributed to a renewed interest in performance practice to have the eighteenth century, but scholars consider the technique described in this treatise of little merit today without the use of a period violin and bow.

The perception that Geminiani used an antiquated violin and bow that do not resemble their modern-day counterparts is exaggerated. The modern violin, in fact, was standardized in Geminiani’s time, closely resembling today’s instrument. The developments in the violin that occurred after the publication of Geminiani’s treatise did not revolutionize the way it was played. The angle of the neck, the thickness of the neck, the length of the fingerboard, and the curve of the bridge all changed, but these

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alterations were largely aimed at enhancing sound production. In some ways, they improved facility, but none would render an earlier philosophy of violin technique meaningless.

There is a greater difference between the bow of Geminiani’s time and the modern bow, though the one Geminiani would have used resembles the modern bow in several ways. As a disciple of Corelli, Geminiani would have used some form of the “Corelli” bow, one in use as of c. 1700. This bow was longer and had a straighter stick than the earlier seventeenth-century bows, as well as a “down turned tip to raise the stick away from the hair, matching the frog.”\footnote{John Dilworth, “The violin and bow - origins and development,” in The Cambridge Companion to the Violin, ed. Robin Stowell (Cambridge: Cambridge University Press, 1992), 24.} It is likely that Geminiani’s bow had an even deeper shape to the tip, similar to the modern bow, which was popular c. 1730. In addition, the bow during Geminiani’s time would have had a “clip-in” frog with screw adjustment like the modern-day equivalent.\footnote{Ibid.} The most significant development of the bow after the publication of Geminiani’s treatise was the introduction of the concave stick c. 1780, standardized by François Tourte around the turn of the century. This development is most responsible for the playing qualities of the modern bow, including an ability to produce stronger sounds.

Many believe Geminiani’s treatise to describe a technique of the past, even for his own time, pointing to Geminiani’s description of holding the violin as an example. Geminiani describes holding it under the collarbone. Shortly after the publication of his work, violinists started holding it between the collarbone and the chin. Subsequent editions and translations of The Art of Playing on the Violin provide examples of the
newer practice of holding the violin, though these are not considered to be contributions from Geminiani himself. A French edition of 1752 shows a picture of a violinist holding the instrument under his chin, but maintains Geminiani’s original instructions to hold it under the collarbone.\(^\text{10}\) A German translation c.1785 describes holding it under the chin, but it is not ascribed to Geminiani, who had been dead since 1762.\(^\text{11}\)

Others have criticized the content of Geminiani’s work, claiming that it contains very few precepts. Regarding his treatises in general, Enrico Careri writes, “Lacking any systematic exposition of rules and precepts, Geminiani’s works dignified by the name of treatises seem to be little more than practical manuals for musicians.”\(^\text{12}\) Marion McArtor adds, “It is clear that Geminiani does not attempt to teach by precepts. His simple intention is to provide material from which students can learn proper procedures by execution. In turn, practicing the examples will provide the habit of proper performance.”\(^\text{13}\)

Careri acknowledges that the violin treatise includes more explanations than Geminiani’s other works. The proportion of written material to musical exercises and compositions, however, still strongly favors the latter. Geminiani provides ammunition for these criticisms with the following in his preface:

After the several Examples, I have added twelve Pieces in different Stiles for a Violin and Violoncello with a thorough Bass for the Harpsichord. I have not given any Directions for the performing them; because I think the


\(^{11}\) Ibid.


\(^{13}\) Ibid.
Learner will not need any, the foregoing Rules and Examples being sufficient to qualify him to perform any Musick whatsoever.\textsuperscript{14}

The relative brevity of his directions throughout the treatise cause many to assume that Geminiani did not maintain a philosophy of violin playing, other than to teach through the performance of his musical examples. A closer examination of this work, however, reveals not only that Geminiani had very distinct ideas about violin playing, but also that his philosophies were ahead of his time in many ways. Some of his technique and his conception of violin playing, in fact, are in concert with that of modern-day pedagogy. Whether his material has withstood the test of time or is viewed as prophetic of the future, Geminiani’s treatise is a valuable source of information for violinists today.

From general issues of music making to specific technical matters of violin playing, some of Geminiani’s principles are applicable to modern-day teaching. For years, violinists have articulated a desire to make the violin sound like the human voice. Geminiani was one of the first: “The Art of playing the Violin consists in giving that Instrument a Tone that shall in a Manner rival the most perfect human Voice.”\textsuperscript{15}

Geminiani elaborates in Example XVIII of his treatise, regarding “Piano” and “Forte” as “Ornaments of Expression:” “They are both extremely necessary to express the Intention of the Melody; and as all good Musick should be composed in Imitation of a Discourse, these two Ornaments are designed to produce the same Effects that an Orator does by raising and falling his Voice.”\textsuperscript{16} In the nineteenth century, Baillot echoes similar sentiments in his treatise regarding the progress of dramatic music: “More than any other


\textsuperscript{15} Ibid.

\textsuperscript{16} Ibid., 7.
instrument, the violin must participate in this progress because of its similarity to the voice, a similarity which leads it to imitate the voice even in the very accents [emphasis original] of speech."  

In the twentieth century, Galamian also makes a correlation between violin sound and the human voice. In his treatise, he relates the attributes of a good speaker to what makes a successful musical performance. Extending the analogy further, Galamian compares vowels and consonants to the sounds of a violin in consideration of acoustical elements in performance.  

Geminiani asserts that the use of the bow is of paramount importance for tone quality and music making, a common theme among modern-day pedagogues: "For it is to be held as a certain Principle that he who does not possess, in a perfect Degree, the Art of Bowing, will never be able to render the Melody agreeable nor arrive at a Facility in the Execution." Geminiani mentions twice the importance of the bow being drawn parallel to the bridge, while stating that "the Tone of the Violin principally Depends upon the right Management of the Bow." Geminiani does not describe in more detail how the bow is managed, but this premise is one that others elaborate on in later treatises. Baillot

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19 Ibid., 9.
21 Ibid., 2.
was one of the first to describe the division of the bow\textsuperscript{22} and the implications of varying the sounding-point,\textsuperscript{23} where the bow is drawn across the string, while Galamian led the way in modern pedagogy with a section in his treatise entitled “Tone production,”\textsuperscript{24} discussing the relationship between the speed of the bow, the pressure it exerts on the string, and the sounding-point.

Geminiani also describes in his treatise a manner of positioning the left hand that has withstood the test of time, appearing in numerous subsequent treatises.\textsuperscript{25} Known today as the “Geminiani grip,” it consists of placing the first finger on the E-string, the second finger on the A-string, the third finger on the D-string, and the fourth finger on the G-string to establish the correct position of the left hand. Baillot uses it in his treatise to establish the “usual position” of the elbow\textsuperscript{26} and as a test to “assure yourself that the elbow and the left hand are properly placed,”\textsuperscript{27} while countless other methods use this framework in some way or another. A twentieth-century example occurs in \textit{The Dounis Violin Players’ Daily Dozen}, Opus 20 (1925) by Demetrios Constantine Dounis.\textsuperscript{28}

Dounis uses this setting of the left hand in his first exercise, a variation upon one that


\textsuperscript{23} Ibid., 158-167.


\textsuperscript{27} Ibid., 25.

\textsuperscript{28} Demetrios Constantine Dounis, \textit{The Dounis Violin Player’s Daily Dozen}, Opus 20 (New York: Harms, 1925), 5.
appears in Baillot’s treatise,\textsuperscript{29} to help develop finger independence. The benefit of the “Geminiani grip” is that it encourages supination of the forearm. This motion, the counterclockwise rotation of the left forearm, is a healthy way to keep the fingers over the fingerboard, ready for use, also allowing them to reach a greater distance without straining.

Geminiani demonstrates an awareness of efficient left-hand technique as well. In Example I, section C of his treatise, Geminiani instructs the violinist “not to raise [the fingers], till there is a Necessity of doing it, to place them somewhere else.”\textsuperscript{30} Again in Examples VII and IX, Geminiani reminds the violinist to let the fingers rest on the strings.\textsuperscript{31} This notion is extremely sound for efficient left-hand technique, despite some violinists’ reluctance to acknowledge it. The premise is that the left hand does not require an action in order to produce sound on the violin and will work more efficiently with fewer actions. Having fingers already down on the string reduces the number of things the fingers have to do. Many violinists recognize the benefits of this and have incorporated it into their technique. Some do not support this theory, considering it too restricting for the left hand. Baillot’s solution was to keep the fingers down during fast passagework, but not for slow or moderate tempi passages. His treatise illustrates solely


\textsuperscript{31} Ibid., 4-5.
the position of the fingers for slower playing, however. Baillot also insisted that when "only a single finger is held down, the three other fingers must be held in the air [emphasis original]." The illustrations in Galamian's treatise show all of the fingers resting on the string. While Galamian does not elaborate further, perhaps reluctant to set down a fixed rule, his treatise demonstrates an added benefit to having the fingers down, creating a framework in which the fingers "know" their placement in relation to each other, assisting with good intonation.

Geminiani's treatise advocates a separation in the learning of the left and right hands, an idea familiar in modern pedagogy. In Example I, section C of his treatise, Geminiani alludes to the benefits of this separation, expecting the first six examples of his work to be studied without the bow:

The fingering, indeed, requires an earnest Application, and therefore it would be most prudent to undertake it without the Use of the Bow, which you should not meddle with till you come to the 7th Example, in which will be found the necessary and proper Method of using it.

In Example VII of his treatise, when the bow is to be used, Geminiani refers the reader to Example XXIV, which teaches "the Art of Bowing." Exemplifying the separation of left and right hands, Geminiani expects Example XXIV to be mastered before playing Example VII: "This Practice of the Bow should be continued, without attempting any

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33 Ibid., 24.
Thing else until the Learner is so far Master of it as to be out of all Danger of forgetting it."36 Separating the left and right hands, focusing on one at a time, is a common practice today. Beginners are often taught to develop the left and right hands separately, using pizzicato to concentrate on the left hand, and playing open strings with the bow. This is yet another example of Geminiani’s pedagogical philosophy remaining pertinent today.

Geminiani was also innovative with his chromatic fingerings. In Example II of his treatise, Geminiani suggests fingering chromatic scales using a new finger on each note, unlike his contemporaries: “The Position of the Fingers marked in the first Scale (which is that commonly practiced) is a faulty one; for two Notes cannot be stopped successively by the same Finger without Difficulty, especially in quick Time.”37 David Boyden points out that Geminiani’s fingering was disregarded for some time: “Geminiani’s instructions with respect to fingering each note of chromatic passages with a separate finger was so far in advance of his time that this fingering had to be rediscovered in the twentieth century by Joseph Achron and expounded by Carl Flesch.”38 This type of fingering, also endorsed by Galamian, is now a part of modern-day practice.

Geminiani’s treatise reveals flexibility in his music making, showing concern for the musical result above everything else. He opposed his contemporaries’ “Rule of the Down Bow,” established in French dance music, requiring every first beat of the measure to be played down-bow. He instructs the reader to “[take] Care not to follow that

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36 Ibid., 9.
37 Ibid., 4.
wretched Rule of drawing the Bow down at the first Note of every Bar.” Geminiani’s overall concern for the music is exemplified in Example XXIV of his work, cautioning against marking time with the bow:

So in playing Divisions, if by your Manner of Bowing you lay a particular Stress on the Note at the beginning of every Bar, so as to render it predominant over the rest, you alter and spoil the true Air of the Piece, and except where the Composer intended it, and where it is always marked, there are very few Instances in which it is not very disagreeable.

Geminiani also stood apart from his contemporaries regarding vibrato, advocating the use of continuous vibrato, much like today. He discusses the “Close Shake” as the fourteenth “Ornament of Expression” in Example XVIII of his treatise: “… and when it is made on short Notes, it only contributes to make their Sound more agreeable and for this Reason it should be made use of as often as possible.”

David Boyden observes:

Several years earlier in his Rules for Playing in True Taste (Op. VIII), Geminiani not only makes the same remark, but emphasizes it by distinguishing between the incipient continuous vibrato, recommended for the violin, and the vibrato as a specific ornament which he finds more appropriate to the German flute. The vibrato of the latter, says Geminiani, ‘must only be made on long Notes’. Thus with Geminiani the violin vibrato as a specific and occasional ornament is replaced by what is in principle the continuous vibrato.

For years after Geminiani’s treatise, the use of vibrato was discussed at length, mostly to ensure it was used sparingly or as an ornament. It was not until the turn of the twentieth

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40 Ibid., 9.
41 Ibid., 8.
century, around the time of Fritz Kreisler, that continuous vibrato made its way back into violin playing.

Pierre Baillot: *L'Art du violon (1835)*

As much as the Italian school was the center of violin playing and teaching in the eighteenth century, the French school grew out of that and became the foremost place for violin study in the nineteenth century. The development of the Paris Conservatoire established a place to expound the new ideals in violin playing, exemplified and inspired by the playing of the great Italian violinist, Giovanni Battista Viotti. The founders of the Paris Conservatoire, Rodolphe Kreutzer, Pierre Rode, and Pierre Baillot, considered disciples of Viotti, created a large body of pedagogical material during their time, codifying and disseminating their teachings. Their influence on violin pedagogy to follow was significant, contributing to the development of the Franco-Belgian school of violin playing, which produced such violinists as Henri Vieuxtemps and Eugène Ysaÿe,\(^{43}\) while starting a lineage of French teachers that, through Lucien Capet, traces to Ivan Galamian in the twentieth century.\(^{44}\)

Much of the pedagogical material from the Paris Conservatoire remains in use today. Étude books by Kreutzer and Rode are staples of the pedagogical literature, in part the result of Galamian’s teaching. While Baillot also wrote twenty-four études,

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published after his death and currently out of print, his most significant contribution to
the pedagogical material is his treatise, L'Art du violon.

Published in 1835, L'Art du violon reflects the teachings of the Paris
Conservatoire during the first half of the nineteenth century. It is a revision of an earlier
work written by Kreutzer, Rode and Baillot together, Méthode de violon (1803), which
had established the fundamentals of violin instruction at the Paris Conservatoire. Baillot
states that it was always the intention of the authors to revise this work from the time it
was written, claiming it was an experiment and that they were still learning about
pedagogy. Despite the fact that Kreutzer and Rode were no longer living at the time of
this revision, Baillot writes on their behalf, using “we” in place of “I,” maintaining that
this work is representative of the three of them. While this treatise is a complete revision
of the earlier work, Baillot states, “the fundamental principles of the first Method have
been retained.”

The breadth of the curriculum is much greater than any previous violin treatise. It
includes written prose and music examples comprising almost five hundred pages and
over twenty-five topics. The treatise attempts to be comprehensive, in addition to the
violin technique, with historical information about the violin and performers, as well as
discussions on “how to practice” and the “means of expression.” It is also a valuable

45 Louise Goldberg, “Editor’s Introduction,” to Baillot’s L’Art du violon (Paris: Dépôt
Central de la Musique, 1835; reprint, ed. and trans. Louise Goldberg, Evanston, Illinois:
Northwestern University Press, 1991), xiv (page citations are to the reprint edition).
(page citations are to the reprint edition).
47 Ibid.
48 Ibid., 7-9.
49 Ibid., 447-470.
historical source for performance practice with sections on “ornamentation” and “holds and cadenzas.”

Like Geminiani’s treatise, there are many techniques that Baillot advocates which are maintained in modern-day pedagogy. As mentioned above, Baillot’s use of the “Geminiani grip” and his notion of keeping the left-hand fingers on the string during fast passagework not only perpetuate ideas of Geminiani, but also continue to be used in some fashion today. In addition, Baillot’s advice regarding extensions, trills, and the choice of fingerings remains helpful for present-day violinists.

Baillot was particularly concerned with a bad habit many violinists had during his time regarding extensions:

A very common fault is to pull the wrist back when the violinist wants to play an extension or when he places the little finger on a lower string; the result is an effect contrary to what he wishes to have, since he is pulling the finger farther away at the same time he is trying to advance it.

Baillot mentions this again in entirety later in his treatise, also providing exercises to practice extensions with the instruction to “Extend the little finger without moving the wrist back” before each exercise. In addition, there are illustrations showing the proper and improper positions of the left hand during extensions. Unfortunately, Baillot’s warnings did not erase this bad habit from violin technique as many violinists today have the same problem of left-hand position. Baillot’s reasoning is very sound and many teachers find themselves echoing his instructions.

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50 Ibid., 475-480.
51 Ibid., 278-288.
52 Ibid., 294-327.
53 Ibid., 20.
54 Ibid., 267.
55 Ibid.
56 Ibid., plate IIIb, figs. 25-26.
Regarding trills, Baillot advocates less pressure in the main finger while trilling: "It is easier to play the trill [emphasis original], especially in fast passages, by pressing the main finger only lightly during the movement of the other fingers; if the violinist does this, the movements of the trilling finger are freer." Many violinists today struggle to get trills clean and fast. Some resort to using vibrato as a means of moving the trilling finger quickly, but this sacrifices clarity. Baillot’s suggestion, using less pressure in the main finger while trilling with a proper finger-action, is still best for clarity and speed.

Baillot outlines in his treatise some factors involved in determining fingerings, stating, “fingering [emphasis original] cannot be set definitively or in a uniform and unvarying manner.” He discusses three different considerations for choosing an appropriate fingering: “the most secure fingering,” “the easiest fingering,” and the “fingering that is expressive.” Baillot remarks that the most important factor is expression, choosing a fingering that is characteristic of a certain composer. Then the violinist can choose for security—that is, which fingering offers the most secure intonation, with particular interest on when to shift. Finally, the violinist can consider the size of his hand, choosing a fingering that accommodates him. These considerations are the same today, with the same order of priority articulated by Baillot.

While there are many commonalities between Baillot’s left-hand technique and that of modern-day pedagogy, Baillot’s most significant contributions to violin technique, paving the way for further exploration in the twentieth century, pertain to the bow. In his treatise, Baillot addresses a few physical issues that are still helpful today, such as

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57 Ibid., 132.
58 Ibid., 257.
maintaining a distinction between the upper arm and forearm motions,\textsuperscript{59} and using the fourth finger to support the weight of the bow as it approaches the frog.\textsuperscript{60} His insights on the effect of sounding-point, however, were even more perceptive and influential on future violin pedagogy.

On a fundamental level, Baillot understood that bringing the bow closer to the bridge generally would produce more sound: “Bring the hair a little closer to the bridge or leave it at a distance, depending on whether you want to produce more or less sound in a melody when you are playing loudly.”\textsuperscript{61} Much more intuitive was his acknowledgment that there is a relationship between the sounding-point, the speed of the bow, and the pressure exerted on the string. Baillot noticed that in keeping the pressure and the sounding-point the same, “the bow must be drawn more slowly for low sounds than for high ones.”\textsuperscript{62} He also writes, “the violinist can produce high notes which are very intense by attacking the string very close to the bridge.”\textsuperscript{63} Though he does not elaborate further, Baillot has uncovered some truths about the sounding-point: the lower notes, which are the thicker strings and/or notes with a relatively longer string-length, require a slower bow-speed in order to cause the string to vibrate; the higher notes, which are the thinner strings and/or notes with a shorter string-length, require a sounding-point closer to the bridge to cause the string to vibrate.

Baillot also informs the violinist how to choose a sounding-point, speed, and pressure, to evoke different timbres out of the four strings of the violin. He tells how a

\textsuperscript{59} Ibid., 23.
\textsuperscript{60} Ibid., 25.
\textsuperscript{61} Ibid., 22.
\textsuperscript{62} Ibid., 228.
\textsuperscript{63} Ibid.
violinist can imitate the timbre of an oboe on the A-string: “In order to imitate this timbre, the violinist must press the bow a little more than usual, bring it closer to the bridge, and feel that the roughness of the bow hair inhibits, so to speak, the free vibrations of the string.”\textsuperscript{64} Likewise, Baillot mentions that on the D-string, a violinist can produce flute-like sounds: “In order to perform them, he draws the bow over the fingerboard very lightly and rapidly so that the string will have the greatest possible freedom.”\textsuperscript{65}

Baillot demonstrates an awareness of how the choice of sounding-point can affect the execution of chords as well. Regarding sounding three strings simultaneously, Baillot instructs the violinist to move the sounding-point to a place where all three strings can be caught at once: “When playing triple stops, the violinist must place the bow near the fingerboard on the D string and play at the frog; since the strings are more flexible away from the bridge, the violinist need only press on the string we have indicated [the middle string], which is the most elevated, and the two other strings will sound at the same time.”\textsuperscript{66} While Baillot does not explore the relationship of sounding-point, speed, and pressure further in his treatise, he initiated an inquiry into an area that is central to understanding the technique of producing sound on the violin. There is further discussion of the relationship between sounding-point, speed, and pressure in the twentieth century, particularly by Galamian in his \textit{Principles of Violin Playing & Teaching}.

Baillot’s treatise contains other valuable information regarding bow technique. He discusses divisions of the bow with their natural uses, dividing the bow in three parts,

\textsuperscript{64} Ibid., 247.
\textsuperscript{65} Ibid., 249.
\textsuperscript{66} Ibid., 146.
the frog, the middle, and the tip. Baillot relates their characteristic qualities to strength, balance, and softness, respectively. From these divisions, the violinist chooses with which part of the bow to best achieve the intended result. Baillot also endorses studying bow-strokes where the nuances are contrary to the natural qualities of the bow, developing the ability to sustain a strong tone towards the tip of the bow, despite its lightness, and to play lightly at the frog, despite its weight.\footnote{Ibid., 158-167.}

Naturally, violin technique has developed further since Baillot’s time, making some aspects of the technique described in his treatise no longer applicable today. For example, Baillot advised violinists not to bend their thumb while bowing and to raise their wrist high at the frog.\footnote{Ibid., 21-23.} Perhaps these two ideas worked together, keeping the bow parallel to the bridge and lessening the weight at the frog. The modern bow-arm, influenced by Galamian, has the thumb and fingers bend to maintain the bow direction instead, eliminating the very high wrist. Baillot also used the “rule of the down bow” to determine his bowings.\footnote{Ibid., 27.} While this rule is antiquated today, for those seeking an informed practice for the performance of the music to which Baillot refers, particularly works by Viotti, his treatise can be a valuable reference. Baillot’s chromatic scale fingerings are considered outdated as well. They consisted of using the same finger on adjacent notes,\footnote{Ibid., 111-120.} typical fingerings for most violinists until the late nineteenth century. They are not used much today, for they do not provide the clarity and facility achieved by using a new finger on each note. Also contrary to modern practice, Baillot endorsed
resting the left hand against the violin in third position for difficult passages.\textsuperscript{71} This is not advisable since it removes the hand from its normal position, disrupting the framework of the hand, potentially causing faulty intonation. Finally, Baillot’s use of vibrato, which was common during his time, is not encouraged nowadays. It was used sparingly and consisted of beginning and ending each note without vibrato.\textsuperscript{72} Today, in an era of continuous vibrato, Baillot’s version would seem fitful and disruptive.

Baillot’s pedagogical philosophy, however, remains applicable today. His three-step lesson is considered innovative, “integrating music and musicality with technique.”\textsuperscript{73} It consists of explaining the technique, providing exercises to work on that technique, and giving examples of its application in the violin literature. Regarding technique in general, Baillot strives for finding the most “natural” execution, stating, “...the natural consists of making only the movements that are necessary.”\textsuperscript{74} Baillot also believed in working gradually from simple to more difficult matters, and his pedagogical agenda is evident as well by his inclusion of a section in his treatise on practicing.\textsuperscript{75}

Baillot’s treatise is a valuable resource for violinists today in additional ways. It has a very good section explaining harmonics and artificial harmonics,\textsuperscript{76} and Baillot demonstrates knowledge of how the bow causes the string to vibrate, something that is glaringly absent from similar works of his time: “The hair has a very great influence on

\textsuperscript{71} Ibid., 264.
\textsuperscript{72} Ibid., 240.
\textsuperscript{75} Ibid., 447-470.
\textsuperscript{76} Ibid., 396-405.
the sound. It has been recognized that the hairs are covered with a great number of nodes or rough spots.\footnote{Ibid., 453.} These nodes are, in fact, what cause the string to vibrate when the bow is drawn across it.

As a historical source, Baillot’s treatise is invaluable. As mentioned above, there is a chapter on “ornamentation” as well as one on “cadenzas and holds.” The latter is most helpful for violinists today since improvising cadenzas has become a lost art, and the knowledge of what to play during a hold is lacking in modern pedagogy. Baillot provides a plethora of examples to help guide violinists performing music in which the composer intended ad libitum cadenzas during the hold. It is also interesting to learn from Baillot’s treatise how violinists dealt with playing quadruple stops, in particular, sustaining four notes at one time. Baillot writes as though it was commonly done during his time, using a technique discovered simultaneously by several people. The technique was to disengage the frog from the bow and play with the bow upside-down with the bow-hair on the strings and the bow-stick under the violin.\footnote{Ibid., 412.} This enabled the bow-hair to touch all four strings, creating the ability to sound and sustain them simultaneously. While the effort to sustain four notes simultaneously has been explored since, including the twentieth century creation of a “Bach” bow by Knud Verstergaard,\footnote{It had a mechanical lever to adjust the hair to play on individual strings or on all at once. David Boyden, “Violin Technique” in The New Grove Violin Family, ed. Stanley Sadie (London: Macmillan Press, 1980; reprint, New York: W.W. Norton & Company, 1989), 51 (page citations are to the reprint).} sustaining four strings simultaneously is no longer sought today, and Baillot’s technique is not in use. This is partly due to its inconvenience and the belief of modern scholars that the
composer of pieces containing quadruple stops did not necessarily intend or expect for all of the notes to be sustained simultaneously.

While Baillot intended for the breadth of material to be comprehensive, the material was not always dealt with comprehensively. Specifically, this work neglects to mention many physical motions required to execute the techniques he describes. For example, Baillot describes when to shift and requires shifting in most of his exercises, but there is no instruction on how to shift; likewise, Baillot discusses the use of vibrato, but not how to vibrate; and the use of the bow is given much attention, though there is no mention of how to move the bow arm.

Ivan Galamian: *Principles of Violin Playing & Teaching* (1962)

Written in 1962, Ivan Galamian’s *Principles of Violin Playing & Teaching* addresses the physical actions of violin playing much more expansively. Galamian provides thorough explanations of the physical motions of his violin technique to guide the violinist, and also often includes instructions for the teacher to assist the student in mastering techniques. This is exemplified in his writings about vibrato:

Many beginners will have difficulty with the vibrato because they start the movement with the fingers instead of with the hand. They try to make the hand (or the arm) move by elongating the finger. Instead, the impulse should come from the hand (or arm). The finger should move only passively, yielding and letting itself be moved by the actions of the hand. The best way to overcome such difficulty when it exists is for the teacher first to ease up and free completely the position of the student’s hand; then to grasp the loose skin under the base knuckle of the vibrating middle finger (the second finger) and perform the vibrato swing for him. This
will soon give the student the feeling for the correct movement and the passive yielding of the finger.\textsuperscript{80}

In addition to providing information about the execution of techniques, Galamian guides teachers towards solving problems for students who might already have developed bad habits as well. Again regarding vibrato, “The arm vibrato can occasionally serve a good pedagogical purpose in cases where a student has a very bad type of hand vibrato.”\textsuperscript{81} While Galamian’s treatise is exhaustive, anticipating ways in which violinists might go astray with their technique, he cautions the reader to take from his writings only what might be appropriately applicable: “Let us remind the reader that all of the aforementioned exercises should be practiced only by those who need them.”\textsuperscript{82}

The technique described in Galamian’s treatise is in many ways what is considered current pedagogy, leaving little to discuss about their relationship, other than that Galamian heavily influenced the way violin is now taught. His treatise is also thorough in its explanations and examples, providing technical exercises to develop some of the techniques, often referring to an étude in the available literature that would best address a particular technique, and providing examples in the violin repertory illustrating the application of a specific technique and/or the use of his principles.

Galamian wrote his treatise at the encouragement of some of his students, who were determined that he document his teachings. Galamian also was disturbed by a number of the other teaching methods during his time and decided to set forth some of the principles in which he believed: “Many things are being taught by the various


\textsuperscript{81} Ibid., 40.

\textsuperscript{82} Ibid., 42.
present-day methods that I would not care to endorse." At the same time, Galamian's pedagogical philosophy and modesty led to this disclaimer: "The system that I have tried to present in the following pages is the one that I believe to be the most practical, but I do not contend that it is the only right or only possible one."

Among the differences Galamian had with other methods included their insistence upon rigid rules for everything regarding violin playing, their failure to recognize the importance of the interdependent relationship of individual elements in violin technique, and an overemphasis on the purely physical elements of violin playing. Galamian sought to provide general principles of violin playing that would be "broad enough to cover all cases, yet flexible enough to be applied to any particular case." Galamian was successful in his mission, while providing the clearest descriptions of the requisite physical actions of violin technique to his day. The most significant contribution from this work, however, is not Galamian's articulate descriptions of the physical motions; it is his premise that the mental control over physical movements is of primary importance to an advanced violin technique: "The key to facility and accuracy and, ultimately, to complete mastery of violin technique is to be found in the relationship of mind to muscles [emphasis original], that is, in the ability to make the sequence of mental command and physical response as quick and as precise as possible."

Galamian uses the term "correlation" to describe and refer to the relationship between the mental and the physical, calling it "the immediate and accurate response of

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83 Ibid., 1.
84 Ibid., xi.
85 Ibid., 1.
86 Ibid., 2.
the muscles to the directives of the mind.\textsuperscript{87} This relationship is developed and honed by practicing, stressing the significance of having good practice skills. Galamian believed that the technique of good practice was one of the most important things that a teacher could teach; and that inherent in good practice was improving correlation.

Galamian asserted that violinists learn by solving problems, therefore, practicing should present the mind-muscle unit with problems to solve. These problems should involve rhythm and coordination and progress during practicing from simple to more complex. Galamian believed that physical practicing should include mental preparation: “The mind, which has to be able to anticipate the action, must have a clear picture of the motion involved, of its technical timing, and of the anticipated sound in order to give its commands with clarity and precision.”\textsuperscript{88} These remarks about practicing are equally germane to specific violin techniques.

Galamian’s treatise also established how current pedagogy regards the use of the bow, specifically, the relationship between the speed, the pressure, and the sounding-point. While their relationship had been mentioned in early treatises, including Baillot’s, Galamian’s work was the first to explore it at length. Galamian asserted that the speed of the bow-stroke, the pressure it exerts on the string, and the point at which it contacts the string, are fundamental factors in the use of the bow; they are the means by which violinists manipulate tone-production. Galamian explored each element individually to show the respective roles and inevitable relationships of all three. “These three factors are interdependent, inasmuch as a change in any one of them will require a corresponding

\textsuperscript{87} Ibid., 23.
\textsuperscript{88} Ibid., 99.
adaptation in *at least one* [emphasis original] of the others."\(^{89}\) With an understanding of these elements, violinists can develop the ability to control their bow in entirety and produce any desired sound calculatingly: "A well-controlled and logical division of the bow is of the greatest importance. When it is absent, unwanted dynamics or undesirable tone quality or both will be the result."\(^{90}\) Galamian’s exploration of the speed, the pressure, and the sounding-point, resulted in an understanding of how to distribute the bow, providing insight into the technical means of making music with the violin.

Galamian’s treatise is replete with descriptions of violin technique in use today. While his work is worth thorough study by present day violinists, there are a few ideas regarding specific techniques that particularly deserve mention here, in part because they still are often neglected by violinists, and also because they receive relatively little mention in the enormous scope of his treatise. Despite the fact Galamian does not draw more attention to them, he provides useful insights into shifting, intonation, the crossing of strings, fingerings, and the use of vibrato.

One of Galamian’s most revealing statements regarding shifting actually comes in a footnote in his treatise: "The muscular action involved in the hand finding its new position is centered in the contracting or extending of the angle in the elbow, plus the drawing in or reaching outward of the arm itself."\(^{91}\) Galamian has identified the elbow as a gauge to determine the distance of the shift. The elbow is opened to angles that correspond to different positions on the violin; concentrating on the elbow-angle, therefore, will help with shifting accuracy and consistency. This is one of the most

\(^{89}\) Ibid., 55.
\(^{90}\) Ibid., 56.
\(^{91}\) Ibid., 20.
significant elements of shifting, though Galamian’s respective statement might be
overlooked since it is in the form of a footnote.

One of Galamian’s insights regarding intonation might also be overlooked in his
treatise since it receives little mention and only in the specific context of double-stops:
“...special attention should be given to the close position of the fingers in intervals such
as minor sixths or augmented fourths, which technically become half steps as far as the
left hand is concerned.”92 What is implied in this statement is that violinists can associate
intervals in their left hand both on one string and across all of the strings. The intervals
of a minor sixth and augmented fourth are not the only ones that have corresponding
“left-hand intervals” across the strings; the perfect-fourth and major-sixth intervals are
whole-steps across adjacent strings. This principle can even be applied across multiple
strings, making a major-tenth across two strings a whole-step, and a minor-tenth, a half-
step. The significance of this realization is that violinists can reinterpret large intervals
within one position on the violin as smaller ones for the left hand, making good
intonation, easier. This does not have to be applied only on neighboring notes; the
fingers can serve as a reference point for many notes in a passage if they are left on the
string once they are played.

In a similar vein, Galamian briefly points out a technique for string-crossings that
can be applied on a much larger scale than the specific context in which it is mentioned:
“When the martelé is combined with the crossing of strings, as in Example 58, the bow
should, upon completion of any one stroke, come to rest immediately on the string that is

92 Ibid., 28.
to be played next [emphasis original].”93 Inherent in doing this is anticipating the string-crossing and ensuring that the bow is ready to play on the new string level before playing on that string. This can be done for any string-crossing, not only in the context of martelé-bowing.

Galamian’s philosophies regarding fingerings and the use of vibrato reflect an openness and flexibility still not accepted by many current pedagogues. Though he was a master editor who had specific ideas about fingerings for most of the violin literature, Galamian endorsed variety in their application: “Contrary to the professed convictions of most pedagogues, I most emphatically believe in varying the fingerings, in changing them from time to time.”94 Galamian was equally flexible and comprehensive regarding the use of vibrato: “The schools are, at present, divided on the question of what is the right form of vibrato. Should it be performed by the arm, the hand, or the fingers? Each of these three types has its characteristics, and I feel that because of their different color possibilities all three should be developed and used.”95

There is no question that Galamian’s treatise represents some of the most significant contributions to violin pedagogy from the twentieth century. His work provides valuable information for violinists today regarding specific techniques as well as a general philosophy of violin study. While the execution of traditional violin techniques is not likely to change significantly from what is described in Galamian’s treatise, his work can serve as a springboard for new ways to conceptualize violin technique.

93 Ibid., 73.
94 Ibid., 36.
95 Ibid., 37.
The Principles of Violin Playing & Teaching (1962) by Ivan Galamian looms as one of the greatest violin treatises in the literature. It addressed most comprehensively what was lacking from previous writings about violin technique, providing more specific descriptions of the physical actions required to execute violin techniques, and articulating the relationship of the mind to the muscles towards understanding and perfecting the execution of the techniques. Galamian’s work describes a technique in use today, making it an invaluable source for the study of violin playing.

The invaluable contribution of Galamian’s treatise is the manner in which it lays bare the correlation between the mind and the muscles in violin technique. It is hard to imagine a new treatise that could ever supplant Galamian’s work, but the working manual presented below is not intended to do this. Rather it expounds a way of conceptualizing violin technique based on the use of clear and vivid mental models. Such models are used throughout this manual to facilitate the correlation between the mind and muscles by furnishing easily graspable images that in turn effect desired results in violin technique.

The present manual is not a “how-to” method for beginning violinists, but it can be a valuable source for beginning and advanced violinists alike. It discusses violin technique from a philosophical standpoint and articulates ways to conceptualize the physical manifestations of the techniques. This manual does not purport to create any new ways to play the violin; rather, it sets out to rethink violin technique, reducing violin playing to fundamental principles, through which the most basic and advanced violin techniques can be understood. I have used two questions as a premise for all of the
techniques discussed below: What are the physical processes involved in playing the violin? And how can a violinist use his muscles in playing without inducing limiting or harmful tension?

The philosophy of using the body in a relaxed manner in order to play the violin is offered here as a basis for any technique, but the scope of this manual is not to cover every instance encyclopedically. It aims instead to introduce a broader approach to violin playing and to articulate some general rules on the basis of that approach. As with all rules, there are exceptions. In many cases, the exceptions are noted. For the rest, the general principles stand with the understanding that they not be applied at the expense of common sense.

Many of the actions required to play the violin are described in relation to actions from everyday life, with the intention of providing a means of conceptualizing violin technique away from the violin. Although it is my intention for the manual to be gender inclusive, for the simplicity of writing, I have used the masculine singular throughout this document.
Chapter 1: The Bow-arm

Using the Bow

There are many factors involved in using the bow, from holding the bow, to initiating motions with the bow-arm. Developing a most efficient technique requires an integrated study of how the bow-arm functions, both from a broad perspective and on a detailed level. Different parts of the bow-arm contribute either actively or inactively; that is, some initiate motion and others follow. Examining each part’s contribution will provide an understanding of how to get an intended result most effectively.

Producing Sound

The most essential realization is that violin sound comes from a string vibrating. The main objective in producing sound on the violin, therefore, is to cause a string to vibrate. There are two fundamental ways to achieve this: by plucking the string with a finger, a technique called pizzicato, from the Italian meaning “plucked,” and by drawing the bow across the string, referred to as arco, from the Italian meaning “the bow.”

Examining pizzicato, one can see most clearly what is required to get a string to vibrate. The violinist “catches” the string with a finger and upon pulling the string, releases it. Fundamental for getting a string to vibrate, therefore, is catching and releasing the string. This is also what happens when the bow is drawn across a string. On a microscopic level, each bow-hair has many scales or “little hairs” protruding from it. These scales catch and release the string as the bow is drawn across it. The multitude of scales along each strand of bow-hair cause a succession of catching and releasing the
string for the duration that the bow is drawn across it, enabling violinists to create continuous sounds with the violin. Catching and releasing the string with the bow-hair can be described in terms of vertical and horizontal components respectively. Catching the string is the result of the hair resting and exerting a downward vertical force on it; releasing the string is the result of the hair pulling horizontally across it.

The natural properties of a violinist’s bow-arm can assist in the process of catching and releasing the string. The substantial weight of the bow-arm can be transmitted vertically onto the bow, contributing to catching the string; the arm’s facility of motion can be used to pull the bow horizontally, contributing to releasing the string.

**Vertical and Horizontal Components**

Every bow-stroke has a vertical and horizontal component to which the bow-arm contributes. The implementation of each component and its respective proportions can vary greatly, creating a variety of bow-strokes resulting in a variety of colors and articulations. It is helpful to identify the vertical and horizontal components for each bow-stroke in order to understand the execution of each stroke. The proportion of these components ultimately determines the quality of the results.

On-the-string bowing has the most distinct vertical and horizontal components. The vertical component is specifically the weight of the bow-arm while the horizontal component is specifically the movement of the bow-arm. On-the-string bowing is most successful when these two elements remain well-defined. If the motion of the bow-arm is not purely horizontal and includes some vertical activity, there will be extra pressure exerted on the string. This pressure will hinder the vibrations of the string, compromising
the sound quality. At the same time, if there is insufficient arm-weight on the string, the bow will not catch the string properly and the resulting sound will be weakened.

Ideally, the horizontal and vertical components of on-the-string bowing balance each other out. When the sound quality is compromised, having too much vertical pressure on the string, extra horizontal motion will improve it. Likewise, when the bow moves across the string without completely catching it, extra vertical pressure will enhance sound production. It is of paramount importance that the horizontal and vertical components remain distinct. Catching and releasing the string are two separate events, and while they can happen in very quick succession, they cannot happen simultaneously. The string must always be caught before it can be released. Blurring the distinction of the vertical and horizontal components, and trying to achieve both in one motion, goes against the principles of producing sound with the violin.

Arm-weight

With the assistance of gravity, the bow-arm can exert pressure vertically onto the string to help produce sound. Using the full weight of the arm will help maximize sound production with very little effort. In order to take advantage of this arm-weight, one must realize first where the weight is greatest, and then understand how to transfer it to the bow and onto the string.

The components of the bow-arm—the fingers, the hand, the forearm, and the upper-arm—weigh progressively lighter to heavier from the fingers towards the upper-arm. The greatest source for arm-weight, therefore, is actually the furthest from where the bow-arm connects to the bow. In order to use this arm-weight and maximize sound
production, it is essential to transfer the weight from the upper-arm, through the forearm, into the hand and fingers, on top of the bow, into the bow-hair, and ultimately onto the string.

Unfortunately, using arm-weight is not as simple as saying "relax your arm." Since the upper-arm is the heaviest part, allowing the arm to go limp will cause all of the weight to fall towards the elbow, placing it at a lower level than the hand on the bow on the violin. If the arm-weight sinks below the level on which the bow is playing, it becomes impossible to use this weight to help produce sound. The primary issue regarding arm-weight, therefore, is to find a way to use the "limp arm" in a manner that is not limp. This requires a support system in the bow-arm that transfers the weight from the upper-arm to the bow.

The support system is not easy to describe, but it can be developed through conceptualization. The following exercise outlines how a teacher can help a student discover his support system:

1. Have the student stand without the violin or bow, with his bow-arm limp at his side. Pick up the student’s bow-arm underneath the elbow, having him maintain a limp arm, raising it away from his body to a level that approximates a level of the bow-arm while playing the violin (Fig. 1). Test the student a few times by letting go of the arm so it falls to his side. If the arm remains suspended, point out that the student is holding up his arm, and therefore, his arm-weight. Repeat this process until the arm consistently falls to the student’s side, indicating that he is maintaining a limp arm.
2. Once the student is completely and consistently "letting go" of his arm-weight while you are holding up his elbow, explain that his arm-weight is centered at the placement of your hand—under the elbow. This is the easiest place to feel the arm-weight for no support system has yet been required. Now, place your other hand underneath his forearm, a couple of inches away from his elbow, and ask the student to center all of his arm-weight at the placement of your new hand (Fig. 2). You should feel the student's arm become heavier in your new hand and lighter in your original hand holding the elbow. When all of the weight is in the new hand, remove your original hand from the elbow (Fig. 3). The student has established the beginnings of his support system, having transferred his arm-weight, from the elbow, a couple of inches along the forearm.

3. Repeat the process described in step 2, beginning from the current placement of your hand, moving a few inches more towards the student's hand. You can either place your free hand in the new place, overlapping your arms (Fig. 4), or substitute your free hand at the current placement of your hand, as seamlessly as possible, allowing you to continue without having to overlap your arms (Fig. 5). Once the student has centered his arm-weight at the new place, repeat this process incrementally, a few inches at a time, towards the student's hand. Do not move on until all of the weight is completely centered in each new place. Encourage the student to make adjustments to focus all of the weight to the location of your appropriate hand. This is the manner by which the student will discover his support system. If at any point you sense that there is no longer "complete" arm-weight resting in your hand, go back a step to try to rediscover the support
system. An indication that the weight is not transferring along the support system is if the student's elbow drops below the level of your hand, and his arm feels lighter than when you first began this exercise. It is equally important that the student not raise his arm to get leverage and push down on your hand; this defeats the purpose of the exercise. The arm will feel heavy in your hand, but it will not be the result of natural arm-weight. When executed properly, the entire arm will be on one level and it will feel completely heavy at the location of your hand.

4. Once the weight has transferred to the student's hand, you should be able hold up the student's entire bow-arm using only a couple of your fingers in the palm of his hand (Fig. 6). The next step is for the student to transfer his arm-weight onto the bow. At this point, stop the exercise, have the student pick up his violin, and start all over again. When you reach the juncture with the student's arm-weight transferred into his hand, place the bow on the violin and rest the student's hand on the bow. You will need to hold the bow against the violin to counter the weight of the student's bow-arm until he learns how the violin will support his arm-weight. The student does not need to hold the bow properly at this point; it is sufficient to hold it with the palm of his hand, making a fist around it (Fig. 7). If done correctly, bow-stick should lower and touch the bow-hair. It is important that this be achieved by relaxing the arm-weight and not by pressing with the index finger or pushing with the entire arm. If successful, the student has discovered his support system.
5. The final step is for the student to transfer the weight into his fingers on the bow with a proper bow-hold. The following section will describe a bow-hold that provides a connection to the bow that enables this transfer.

Holding the Bow

The title “holding the bow” is somewhat misleading. The only time the bow is actually “held” is when it is “in the air,” instead of on the violin. During its use, the strings of the violin support the bow, and the bow-arm rests on top of it. When discussing the bow-hold, one is really talking about the connection of the bow-arm to the bow.

The fingers connect the bow-arm to the bow. It is important their connection to be one that enables the arm-weight to transfer onto the bow. A faulty connection will hinder results, even if everything else in the bow-arm is functioning accordingly. As a vertical component, the arm-weight enters "on top" of the bow. The fingers, therefore, must have contact on top of the bow-stick. If the bow is held using the tips of the fingers, creating contact only on the sides of the bow-stick, it will be almost impossible to transfer the arm-weight into the bow.

The following instructions will help establish a bow-hold that maximizes the fingers’ ability to transfer the arm-weight onto the bow, while allowing for utmost facility:

1. Hold out the bow-arm with the palm of the hand facing the ceiling and the fingers comfortably, evenly spaced apart (Fig. 8).
2. Place the bow upside-down on the fingers, so the bow-stick rests on the palm-side of the fingers, running from the tip of the fourth finger to between the first and second knuckles of the index finger (Fig. 9).

3. Press the bow against the fingers, emphasizing the sensation of the bow-stick against the palm-side of the fingers. This is the same sensation that should exist in the fingers when the bow is drawn across a string.

4. Place the thumb on the frog, where the curve of the frog meets the bow-stick (Fig. 10). Allow the second and third fingers to curl around the frog, maintaining the original contact between the bow-stick and the palm-side of the fingers (Figs. 11 and 12). The second finger should be in alignment with the thumb.

With everything functioning properly, it is actually possible to balance the bow-arm and bow on a string without using the thumb, proving that it is unnecessary to grip the bow while playing. In order to do this, place the bow on the string at the frog with the bow-stick directly above the bow-hair, and rest all of the arm-weight on the bow; then remove the thumb (Fig. 14). It is essential for the bow-stick to be directly above the bow-hair or else the bow will tip over. Ultimately, the bow-arm should feel like it is hanging from the violin.

Transfer of Weight: The Role of the Fingers

It is necessary for violinists to be able to alter the amount of arm-weight that transfers to the bow while playing the violin. This is required, on a fundamental level, while drawing the bow from its frog to its tip, in an effort to produce the same level of
sound in all parts of the bow. The bow is heavier at its frog and lighter at its tip; maintaining an equal amount of arm-weight on the bow throughout its use will result in producing more sound at its frog and less at its tip. Technical facility for a violinist includes an ability to play with varying amounts of arm-weight in every part of the bow, creating any dynamic and a variety of colors.

As the final connection to the bow, the fingers can control the amount of arm-weight that transfers to it and the distribution of that weight. Utilizing the fingers in this manner will eliminate the need to alter the support system for the arm-weight in the bow-arm in any way. The fingers, therefore, provide the most relaxed and efficient manner to vary the amount of arm-weight that transfers to the bow.

The system for controlling arm-weight in the bow-arm is similar to a water system in a house. In a house, there is a source for the water, perhaps a water tank in the basement, far away from where the water is used; there are pipes through which the water travels; and there are faucets around the house that turn the water on and off and control the amount of water that comes out. The bow-arm’s greatest source for weight is the upper-arm, far away from the connection to the bow; the arm-weight is transferred through the arm onto the bow; and the fingers, which connect to the bow, serve like a faucet, determining how much arm-weight transfers to the bow. When one is finished using water at a sink, one does not run down to the basement and turn the water off at the tank; one simply turns off the faucet at the sink. Lifting the upper-arm, elbow, or wrist to alter the amount of arm-weight that transfers to the bow is tantamount to shutting the water off at the tank. The fingers can act like a faucet, altering the amount of arm-weight that transfers to the bow; they can also ensure that the arm-weight is not removed from its
support system in the bow-arm. Whether all of the arm-weight is used or not, keeping it in its support system enables a smooth transition when the need to alter the amount of weight arises. If the arm-weight is removed from its system, like the water system in a house, replenishing it from its source is a major event; it takes extra time, and in an effort to do it swiftly, the resulting sound is often compromised. It is also difficult to control the exact amount of extra weight to transfer to the bow if it comes from a source far away. Not unlike the way the water rushes towards a faucet when the source is turned on, the outcome of added weight from a distant source can be somewhat uneven. If the arm-weight remains in its support system in the bow-arm, it is always ready to be used, and therefore, it will be much easier to manipulate how much to use for a desired result.

One can experience the sensation of altering the amount arm-weight that transfers to the bow through the fingers by placing the bow on a string using complete arm-weight, so the bow-stick touches the bow-hair, and then lightening the hand and fingers without lifting the upper-arm, allowing the bow-stick to come away from the bow-hair. The arm-weight should remain heavy in its support system, while the hand and fingers are light, not allowing the weight to transfer to the bow. There are many degrees between using a completely heavy hand and a completely light one that will produce a variety of sounds and colors on the violin.

There is the perception that, considering the weight of the bow, the sound will naturally decay as the bow approaches its tip, and that the violinist must add weight to compensate for this. This notion implies that arm-weight is not a fundamental part of sound production and is to be added where necessary. If one considers that arm-weight is an essential contributor, and that complete arm-weight is the most relaxed manner for the
bow-arm, then the notion of adding arm-weight is unnecessary. In fact, complete arm-weight combines fittingly with the weight of the tip of the bow to produce a strong, healthy sound. The real issue is that there is too much weight as the bow approaches its frog, and it will prevent a string from vibrating.

The most direct manner in which arm-weight transfers to the bow is through the index finger, resulting in the strongest sound. The index finger should be the primary point for transferring arm-weight to the bow at its upper half, since that is where the bow is weakest. If a violinist continues to allow the weight to transfer primarily through his index finger as the bow approaches its frog, one of two things will happen: either there will be too much weight directed to the bow, preventing the string from vibrating, or, the violinist will remove some of the arm-weight by lifting up part of his bow-arm, to continue producing a quality sound. While the latter scenario is more acceptable to the ear, it disrupts the support system for arm-weight in the bow-arm.

The solution is to alleviate the weight from the index finger, causing the other fingers on the bow to absorb it and transfer some of it to the bow less directly. As the bow travels from its tip to its frog, the primary point for transferring arm-weight to the bow changes from the index finger to the second, third and fourth fingers respectively. By the time the bow has reached its frog, most of the arm-weight should be absorbed in the third and fourth fingers and the index finger should no longer be transferring weight to the bow. In order for the third and fourth fingers to absorb the arm-weight, their knuckles need to bend. The base knuckles will lift the fingers, raising the middle knuckles to their level, while the other knuckles remain bent. The fingers will be curled up and the bow will rest deeper in the hand (Fig. 13). Essentially, the fingers act like the
shock absorbers of a car, absorbing the excess weight at the frog of the bow and allowing the support system for arm-weight to stay intact.

The simplest way to feel this while playing is to remove the index finger from the bow during an up-bow, approximately one-third of the bow from the frog. If the other fingers on the bow are malleable, maintaining complete arm-weight without the first finger on the bow will force the third and fourth fingers to absorb the weight as the bow approaches its frog. The bending of the knuckles also will help the bow run parallel to the bridge, bringing the frog closer to the palm of the hand than it is when playing at the tip of the bow.

Violinists may feel as though their third and fourth fingers “want” to fall off the bow as a result of absorbing all of this weight. The muscle responsible for absorbing the weight, running along the side of the hand from the fourth finger towards the wrist, may need to become more developed for the fingers to remain on the bow. Violinists can develop this muscle and acquire the range of motion required of their third and fourth fingers with the following exercise:

1. With the appropriate bow-hold, hold the bow perpendicular to the ground, pointing its tip towards the ceiling (Fig. 15).

2. Without moving the forearm, allow the tip of the bow to fall counterclockwise, away from the index finger on the bow, retracting the third and fourth fingers (Fig. 16). The third and fourth fingers need to relax to allow this to happen. The resulting position, with the bow away from the index finger and the third and fourth fingers completely bent, creates the same sensation as playing on the violin near the frog of the bow.
3. Press with the fourth finger on the bow to bring the bow-tip back to its original position. This motion will develop the muscle on the side of the hand, which is required for this exercise.

4. Repeat steps 1-3, and with each repetition, begin to control the rate of descent of the bow-tip by slowing the retraction of the third and fourth fingers to their bent position.

It is possible to emulate the transfer of weight between the fingers described above by the pronation, counterclockwise rotation, and supination, clockwise rotation, of the forearm. Pronating the forearm puts more emphasis on the index finger; many violinists do this as the bow approaches its tip in order to compensate for its lightness. While this motion provides a feeling of strength, it mainly creates leverage that results in pushing onto the string. This ultimately can inhibit the string from vibrating to its maximum potential. Using the principles described above, the sensation of the weight transferring from the fingers into the bow is of the fingers hanging from the bow. Pronating and supinating the forearm make this sensation impossible and that is why I do not encourage their use for transferring the weight to the bow.

Resistance

There is a tremendous amount of resistance to pulling the bow across a string with the arm-weight exerting its force on top of the string. This resistance, felt in the fingers on the bow, is necessary in order to cause the string to vibrate. The malleability of the fingers makes the difference between maximizing and inhibiting the string's vibrations.
Stiff fingers only contribute to the friction of the bow-hair touching the string, and unless the precise amount of arm-weight is used, they either inhibit or do not elicit the full vibrations of the string; flexible fingers provide a margin of error for the amount of arm-weight used, absorbing in the knuckles the amount of weight that would otherwise inhibit the string's vibrations. The fingers sense the resistance created by pulling the bow across a string, and therefore can make modifications in order to ensure the resistance manifests itself in producing quality sounds.

In many ways, the bow-arm functions similarly to a paintbrush. The forearm and hand, as a unit, act like the stick of the brush; the fingers act like the bristles. Playing the violin with rigid fingers in the bow-hand is tantamount to painting with stiff bristles. Stiff bristles make it impossible to paint a thick, even coat of paint; rigid fingers make it impossible to pull a full, healthy sound. Malleable fingers for the bow-hand, like soft bristles for a paintbrush, absorb some of the pressure exerted on the surface against which they are moving, ensuring the resistance contributes in a positive manner.

Like the bristles of a paintbrush, the fingers generally do not initiate motion. A painter moves the stick of his brush and its bristles follow as a result of the pressure against the painting surface. Similarly, a violinist moves his forearm and hand, and his fingers follow as a result of the pressure against the string. Both the bristles and the fingers drag behind an initiating force as a result of the resistance against the surface on which they are moving. The movement of the fingers following the bow-arm is more difficult to conceptualize than that of the bristles following the paintbrush because of their respective inherent properties and their respective relationships to the surface across which they move. The fingers have established sides and knuckles that bend only one
way; the bristles do not have delineated sides and can move all directions. It is not purely a matter for the fingers to bend and straighten as they follow the bow-arm; that would be the case if the bow-arm were moving vertically up and down. The bow-arm moves horizontally, instead, causing the fingers to bend and straighten on an angle. The resulting position of the fingers following the bow-arm is bent diagonally for the down-bows (Fig. 17) and slightly elongated diagonally for the up-bows (Fig. 18). Again, the motion of the fingers is not an active one; it is a result of responding to the movement of the bow-arm and the resistance of the bow against the string.

The Relationship Between the Bow-stick and the Bow-hair

Using the properties of the bow and the bow-arm to minimize effort and maximize results, the bow functions best when it is played with its stick directly above its hair. This is often referred to as playing with “flat hair” because all of the bow-hair lies flat against the string. If the bow-stick is angled towards the fingerboard so the bow-hair is slightly “on its side” and not all lying against the string, the arm-weight cannot contribute its full potential. Arm-weight is a vertical component that exerts a force on top of the bow-stick. In order to use arm-weight to produce sound, its force needs to transfer vertically to the bow-hair; for this to occur, the bow-stick must be directly above the bow-hair.

In addition to directing the arm-weight to the bow-hair, having the bow-stick above the bow-hair helps the bow-arm remain balanced on the bow. Arm-weight exerts a vertical force, whether or not the relationship between the bow-stick and the bow-hair is angled. When that force is exerted on the bow-stick with the bow-stick not directly
above the bow-hair, without accommodation, it can cause the bow to tip over. Violinists compensate to prevent this from happening, by removing some of the arm-weight or by directing the weight back towards the bow-hair. The latter not only requires more effort, but also the effort involved is not borne from relaxation.

Using "flat hair" to produce sound is beneficial not only because of the relationship between the arm-weight and the bow-hair; quite simply, playing with the bow-stick over the bow-hair means that more hair is touching the string than if the bow is tilted. With more hair touching the string, more scales of the hair will catch the string and cause it to vibrate. This does not mean that violinists must play with "flat hair" all of the time. It means that in order to maximize sound production in the most relaxed manner, "flat hair" is essential. For producing different colors and effects, which require different amounts of weight and perhaps less catching of the string, tilting the bow may be appropriate.

Whether or not the bow is tilted, it is important that the relationship between the bow-stick and the bow-hair does not fluctuate unintentionally. The bow functions as a result of the relationship of its properties; changing the relationship changes how the bow works. Violinists intentionally manipulate the relationship between the bow-stick and the bow-hair to achieve a variety of sounds; unintentional varying of this relationship, however, is detrimental. In general, the relationship between the bow-stick and the bow-hair should remain constant whether playing an up-bow or down-bow, a double-stop or single-stop, and throughout the crossing of strings.
Vertical and Horizontal Components Relative to the Plane of the String

Each string has a plane, across which the bow is pulled in order to cause the string to vibrate. The horizontal plane of the bow resting on a string is that string's plane. While the planes differ from one string to the next, the principles of producing sound from each string remain the same: the arm-weight is settled vertically against the plane and the bow-arm pulls the bow horizontally across the plane. The vertical and horizontal components of producing sound are always calculated in relation to the plane of the particular string.

Depending on the string, these components may be more or less similar to vertical and horizontal angles normally relative to the ground. The plane of the G-string is essentially parallel to the ground; therefore, they have similar vertical and horizontal angles. The planes of the other strings have different angles, each slanting increasingly clockwise, from the D-string to the E-string. Since the angles of the planes for each string differ in relation to the ground, violinists must adjust the vertical and horizontal components of sound production to each string.

The E-string is most difficult to conceptualize in this way because its plane is almost perpendicular to the ground. As a result, pulling the bow across the string resembles a vertical motion in relation to the ground. The action of pulling the bow is still the horizontal component to producing sound, however, and this distinction must not be blurred. Yielding to the vertical position of the plane of the E-string will adversely affect the manner in which sound is produced. It will encourage a pushing motion for the down-bows and a lifting motion for the up-bows, disrupting the support system of the arm-weight and producing a compromised sound.
Adjusting the arm-weight to the planes of the strings can be difficult, since the use of arm-weight is related to the force of gravity acting vertically to the ground. An overlooked variable, directing the arm-weight to a plane that slants clockwise, is the arm’s connection to the body. The shoulder acts like a hinge when the arm moves away from the body and back. Extending the arm to the side and “letting it go” will show that the arm falls back towards the body, not towards the ground. This enables a violinist to direct his arm-weight onto a string whose plane is not parallel to the ground. While the sensation of resting one’s arm-weight on the G-string is of the arm hanging towards the ground, the sensation on the E-string is of the arm hanging towards one’s body. The sensations on the A-string and D-string lie between these two extremes. One way to conceptualize resting the arm-weight against any plane is to imagine that plane “filled-in” like a wall, and the bow-arm resting against that wall.

An irony in violin playing, contributing to violinists’ tendency to blur the distinction of moving the bow as a horizontal component, is that the descriptive terms for bowing are vertical terms: up-bow and down-bow. Since the bow moves horizontally, it would be more accurate to describe bowing in horizontal terms, for instance, pushed bow and pulled bow—the very terms used by French gamba players in the Baroque era. It is highly unlikely, however, that the descriptive terms for the direction the bow travels, which have been in use for centuries, will change; nonetheless, it might be helpful to rename them conceptually.

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Elbow Level

There is no fixed level for the elbow that satisfies all considerations while playing the violin. An appropriate elbow level is directly related to the use of arm-weight and the planes of the strings. Resting the arm-weight within its support system against the plane of a string places the elbow on the plane of that string. Since each string has its own plane, the proper level for the elbow changes accordingly.

In addition to the elbow level changing from string to string, the level of the elbow should also change while playing on one string, with the exception of the G-string. The planes of the D-string, A-string, and E-string slant towards the ground. If the elbow, resting against the plane of one of these strings at the beginning of a down-bow, remains fixed on its original level as the bow travels towards its tip, the bow-hand will finish below the level of the elbow due to the slanting plane. This resulting position will have the arm-weight suspended in the upper arm, removed from its support system. The outcome will be either producing a weaker sound in the upper half of the bow, or having tension in the violinist's bow-arm from pushing on the bow to compensate for the loss of weight. It is most important that the arm-weight is used in the upper half of the bow because that is where the bow is lightest. The elbow must always be on the plane of the string that is played for the arm-weight to be used. In order for the elbow to remain on a plane that slants towards the ground, it needs to lower as the bow travels towards its tip. It is not necessary for the elbow to lower in this manner on the G-string since the plane of the string does not slant; lowering the elbow will only drop the arm-weight below the plane of the string, also preventing the arm-weight from transferring to the bow.
Violinists commonly move their elbow in the lower half of the bow, but hold it on the same level once crossing the middle of the bow, compensating for the lack of weight in the upper half of the bow by using leverage to push onto the string. This often results in a compromised sound because the leverage creates a vertical motion instead of pulling the bow purely horizontally, inhibiting the string from vibrating. Moving the elbow closer to the body as the bow travels towards its tip will enable the use of arm-weight instead. No matter on which string is played or what part of the bow is used, the proper level for the elbow is resting against and following along the plane of the particular string.

**String-crossings**

The most important issue regarding string-crossings is adjusting the bow-arm in order to maintain the use of arm-weight on each string. The elbow is a guide, resting on the plane of the string that the bow is moving across. The motion of the bow-arm, when changing from one string to another, is the elbow moving closer to or further from the body. In order to achieve smooth string-crossings, violinists must anticipate the level of the new string and adjust the arm-weight in advance. The string-crossing motion should occur on the prior note, finishing that note with the arm-weight on the plane of the new string.

For the following discussion, the terms “higher string” and “lower string” will be used to describe the pitch of the string, not the string’s plane. The higher strings actually have lower planes relative to the ground, and the lower strings have higher planes,
potentially causing confusion with terminology. The bow-arm will lower, therefore, moving to a higher string, and rise, moving to a lower string.

In order to move the arm-weight in a manner that does not remove it from its support system, it is best for the elbow to lead a string-crossing from a lower string to a higher string, and the hand to lead a crossing from a higher string to a lower one. Leading with the elbow towards a higher string ensures that the arm-weight arrives on the new string ready for immediate use. Leading with the elbow towards a lower string, however, requires the arm-weight to be removed from its support system and will not ensure that arm-weight is ready for use on the new string. Often violinists lift their elbow while crossing towards a lower string, and it ends up on a higher level than the plane of the new string. Leading with the hand towards a lower string allows the elbow to follow exactly to the appropriate level, ensuring that the arm-weight remains settled in its support system.

An exception to their execution, it is best to lead with the elbow both directions for passages that require fast consecutive string-crossings. Limiting the motion of multiple string-crossings to the elbow helps with facility, making fast passages more manageable. It is still helpful to practice these passages at a slower tempo with the hand leading the string-crossings toward a lower string, as it will “teach” the elbow the appropriate level to anticipate when it eventually leads the crossings.

For multiple string-crossings alternating between two strings, it is helpful to make the motion of the crossings as small as possible. Some violinists do this motion with their hand or fingers, but the elbow can still be used as described above. If choosing to perform the string-crossings with a part of the arm other than the elbow, it is important to
find a plane in between the two strings on which the elbow will remain. A common pitfall among violinists, using their hand or fingers to move the bow from one string to another, is they disrupt the relationship between the bow-stick and the bow-hair. Moving the hand towards a higher string without the elbow, for example, will cause the bow-stick to tilt towards the fingerboard of the violin. Varying the relationship between the bow-stick and the bow-hair will affect the manner in which the bow functions and alter the sound production. At the frog, it is possible to cross towards a lower string without disrupting the relationship between the bow-stick and the bow-hair by using the fingers. The third and fourth fingers can retract, tilting the tip of the bow towards the G-string and placing the bow on the plane of a lower string.

Elbow Movements: Initiating the Down-bow

In order for the arm-weight to follow the plane of a string and for the fingers to follow the bow-arm, it is best to lead a down-bow with the elbow. A smooth bow-change can occur at the frog by anticipating the change of direction and initiating the motion of the down-bow with the elbow. The elbow will feel as though it slightly drops as it "rounds a corner" and pulls the opposite direction.

Often violinists initiate with their elbow in a similar manner for an up-bow, but this is not as successful. Leading with the elbow for an up-bow, lifts it from the plane of the string, removing the arm-weight where it is needed most, at the tip of the bow. In order for the bow-arm to remain on the plane of the string, the up-bow should follow the path of the down-bow in reverse. This will require the elbow to retract as the up-bow begins, pulling the hand and bow in towards the violinist's body. Once the elbow is past
a ninety-degree angle and the bow is near its midpoint, the hand should continue to push
the bow along the plane with the elbow following behind. The bow-change at the frog,
therefore, will be the hand finishing the up-bow pushing in one direction, while the elbow
"rounds the corner" and begins to pull the bow in the opposite direction.

Elbow Movements: Hinge

The elbow functions like a hinge in the upper half of the bow, opening for the
down-bow and closing for the up-bow. This hinge is not like a standard door hinge, with
the door pivoting around a fixed point; rather, it is similar to the hinge of a folding door,
often used for a closet or a telephone booth. The essential characteristic of this hinge is
that it retracts as the sections of the door fold together, keeping the ends of the door along
a straight path. The elbow functions exactly the same way for the bow-arm in the upper
half of the bow. For an up-bow, the forearm and the upper arm fold upon each other as
the elbow retracts, moving the bow along a straight path. The forearm never fully folds
upon the upper arm, however; depending on the length of the arm, the elbow retracts
approximately to a ninety-degree angle, and the upper arm and forearm only continue to
fold upon each other as the path of the bow dictates.

Détaché

One of the most fundamental bow-strokes, détaché consists of repeated
alternating up-bows and down-bows. The "detached" quality of this bow-stroke comes
from simply changing the direction the bow is moving. There does not need to be any
additional detachment or articulation between the notes.
The détaché-stroke occurs usually at the middle of the bow towards its upper half. It is an “on-the-string” bowing that uses complete and constant arm-weight, and is most successful with the bow-stick directly above the bow-hair. The most important element of détaché is that the bow moves horizontally back and forth along the same path, running parallel to the bridge. The essential motion of the bow-arm for détaché is the opening and closing of the elbow.

Since the elbow acts like a retracting hinge, as described above, the sensation of the up-bow is pulling inwards towards one’s body. This sensation should be emphasized, to create an equal sound with the up-bow and down-bow. Creating an equivalent sound with the up-bow will also require extra effort on the D-string, A-string, and E-string, because of the angles of their respective planes and the opposing force of gravity.

The motion of détaché is continuous; despite changing directions, the bow never stops moving. The bow-arm should still function like a paintbrush with its fingers absorbing the arm-weight and following the bow like the bristles of the brush. For faster détaché, the motion of the bow-arm should become smaller, causing less bow to be used, and there will be almost no noticeable finger motion.

Détaché tends to become more complicated for violinists when combined with multiple string-crossings. The difficulty is keeping the détaché motion distinct from the string-crossing motion. Both involve the elbow, and therefore, they can be easily confused. The détaché motion is specifically the opening and closing of the elbow; the string-crossing motion is the elbow moving closer to or further from the body. These are two different motions that can occur simultaneously, but it is crucial that each motion remains distinct. The coordination required to execute these distinct motions at the same
time is similar to that of rubbing one's tummy with one hand while patting one's head with the other.

Certain combinations of these motions feel better than others. For example, crossing to a higher string on a down-bow feels relatively natural as the elbow opens and lowers at the same time. This same string-crossing on an up-bow, however, feels entirely different as the elbow pulls inward while lowering. Likewise, crossing to a lower string on an up-bow feels fine as the elbow rises and pulls inward simultaneously; this crossing on a down-bow seems more awkward as the elbow rises and opens at the same time. The key to successful string-crossings in détaché is keeping these two motions distinct. It is helpful to practice each of the string-crossings mentioned above, slowly, until their coordination is mastered.

**Principles of Weight, Speed, and Sounding-Point**

Sound production with the violin is achieved through the use of the bow; the bow is used to cause the strings to vibrate, producing sounds that can be shaped towards some musical end. Producing and shaping sounds involves understanding how the bow causes a string to vibrate and the variables that affect the vibrating string. The variables are the pressure of the bow on the string, the speed with which the bow is pulled across the string, and the point of contact between the bow and the string, called the sounding-point. These variables are interdependent; changing one of them affects the others. Bow-control involves the ability to manipulate each of these variables in any part of the bow. One factor that is invariable for producing sounds of quality is that the bow must travel along a straight path, parallel to the bridge.
As described above, resistance plays a role in causing a string to vibrate. The violinist's arm-weight contributes to the resistance, exerting a vertical force on the bow and causing it to catch the string; the bridge of the violin supports the string, countering the arm-weight and creating the resistance. As a result, the resistance of drawing the bow across a string is greatest closest to the bridge, making it possible to use a tremendous amount of arm-weight when the bow is drawn there. The resistance is lessened further from the bridge, towards the fingerboard, making it impossible for a string to support as much arm-weight when the bow is drawn there; too much arm-weight, when drawing the bow near the fingerboard, will inhibit a string from vibrating. The amount of arm-weight used to produce sound, therefore, is directly related to the choice of sounding-point. The heaviest arm-weight requires a sounding-point closer to the bridge; a lighter arm-weight requires one further away, towards the fingerboard.

The bow must also be drawn more slowly near the bridge due to the resistance, in order to catch and cause a string to vibrate. Likewise, the bow can be drawn more quickly where there is less resistance, further from the bridge. In general, a string will vibrate best if the bow is drawn slowly with a heavy arm-weight close to the bridge, drawn fast with a light arm-weight close to the fingerboard, or some appropriate combination of these variables for points in between.

There are two additional considerations regarding the sounding-point: the thickness and the length of the string. The E-string is the thinnest string, and the A-string, D-string, and G-string are incrementally thicker. The thinner strings vibrate best when the bow is drawn with a sounding-point closer to the bridge; the thicker strings vibrate best when the bow is drawn with a sounding-point further from the bridge. The
fingers of the violinist's left-hand add another variable, constantly changing the length of
the string that is vibrating. A violinist shortens the length of a vibrating string by placing
a finger on it, and lengthens the vibrating string by removing a finger from it. In order to
produce the best sound, the bow must be drawn with a sounding-point closer to the bridge
for a shorter vibrating string-length, and with a sounding-point further from the bridge for
a longer vibrating string-length.

All of these factors contribute to producing sounds on the violin. There is a
specific combination of arm-weight, bow-speed, and sounding-point on a particular string
thickness and length that will cause the string to vibrate to its maximum potential.
Changing any one of these variables will affect the others and ultimately the sound
produced. Making music with the violin includes creating a variety of sounds and colors.
Understanding and being able to manipulate the arm-weight, bow-speed, and sounding-
point on the violin offers the possibility of creating a great number of quality sounds and
colors. They are also the tools with which violinists control the bow, distributing it for
comfort and for making musical phrases.

Additional Bow-strokes

The principles of using the bow in order to cause a string to vibrate are the same
for every bow-stroke. Some bow-strokes cause a string to vibrate more than others.
"On-the-string" bow-strokes such as legato and détaché cause a string to vibrate to its
maximum potential, while "off-the-string" bow-strokes such as spiccato and ricochet are
more percussive by nature. Every bow-stroke has a vertical and horizontal component;
their respective proportions differ to create their particular results.
The bow’s natural properties assist in the execution of “off-the-string” bow-strokes. The tension between the bow-stick and the bow-hair, and the concave nature of the bow-stick, create springiness in the bow; the bow naturally bounces if dropped on the string. “On-the-string” bow-strokes require constant arm-weight, and specifically horizontal motion, to keep the bow from bouncing. Lessening the amount arm-weight and adding vertical motion to the use of the bow will cause it to bounce.

“Off-the-string” bow-strokes can create a variety of articulations by changing the relationship between the bow-stick and the bow-hair. Playing with “flat hair,” so the bow-stick is directly over the bow-hair, will bring about much response from the bow, causing the bow-stroke to have more articulation. Tilting the bow-stick towards the fingerboard so the bow-hair is “on its side” will result in less response from the bow, creating a softer bow-stroke with less articulation. There are immeasurable degrees to which their relationship can change, making possible a great variety of “off-the-string” articulations.

**Spiccato**

Violinists often use the term “spiccato” to describe any bow-stroke in which the bow bounces from the string while changing direction on each note. There are several different ways the bow can bounce, ranging from deliberate vertical contributions from the violinist, to allowing the natural springiness of the bow to work on its own. Traditionally, spiccato refers to the bow being deliberately dropped towards the plane of the string for each note. Today, this term is often used regardless of how deliberately the
bounce of the bow is created, often including another “off-the-string” bow-stroke, called sautillé.

The horizontal component of spiccato is détaché. It is a forearm bow-stroke, usually performed near the middle of the bow, caused by the violinist’s elbow opening and closing for the down-bows and up-bows, respectively. Spiccato combines a vertical dropping of the forearm, hand, and bow as a unit, on every note, to the détaché. The bow begins above the string and the forearm unit creates a “dropping” impetus for each note. The natural springiness of the bow causes it to rebound from the string after each impetus, allowing it to be dropped again for the next note.

It is helpful to practice the horizontal and vertical components of spiccato separately in order to understand how the bow-arm must function. As mentioned above, the horizontal component is simply détaché. Practicing a spiccato passage using détaché will reinforce the opening and closing of the elbow that is necessary for this bow-stroke, and assist with “teaching” the elbow any string-crossings that exist. The vertical component of spiccato is dropping the forearm, hand, and bow as a unit, towards the plane of the string, and should be practiced on each note. The sound quality of the vertical component on its own will be quite percussive, but it will improve when combined with the horizontal component. The forearm, hand, and bow should move together in the shape of a U, beginning above the string and dropping towards it, making contact with the string at the bottom of the U, and springing back to its original height. When practicing the vertical component of spiccato, contact should be made with string at the same place of the bow for each up-bow and down-bow.
Once the horizontal and vertical components have been mastered separately, they should be combined. One way to combine them is to repeat a short passage beginning slowly, playing first the horizontal component, followed by the vertical component, in alternation. Increase the tempo after both are played, repeating this process many times until the tempo approaches the desired speed of the bow-stroke. As the tempo becomes faster, allow the horizontal and the vertical components to blend together until they are one.

Sautillé, while included with spiccato as an “off-the-string” détaché, is at the opposite end of the spectrum. It differs from spiccato in that every bow-stroke does not have its own impetus; rather, the violinist relies more on the springiness of the bow itself to cause it to bounce. The bow will bounce as a result of its natural properties if the violinist redistributes his arm-weight. During détaché, for example, the violinist’s arm-weight causes the bow-stick to touch the bow-hair. Removing some of the arm-weight allows the bow-stick to release from the bow-hair, enabling the bow to bounce due to the flexibility between bow-stick and the bow-hair. In essence, using arm-weight during détaché prevents the bow from bouncing; redistributing the arm-weight to make the hand lighter during sautillé allows the bow to spring from the string. This bow-stroke can be practiced beginning with détaché, speeding it up, using less and less bow, and lightening the hand and wrist until the bow begins bouncing.

Ricochet

Ricochet is one of the most percussive bow-strokes. As its name indicates, it is comprised of the bow hitting the string and bouncing back. As with all “off-the-string”
bow-strokes, the natural properties of the bow cause it to spring back from the string. A ricochet-stroke usually bounces several times in the same direction, each bounce a rebound from the initial contact with the string. It is most often performed on a down-bow, and sometimes finishes with the final note up-bow.

Similar to spiccato, it is helpful to identify the horizontal and vertical components of ricochet. When practicing each separately, the horizontal component is a very heavy bow-stroke, slurring the notes of the ricochet on the string. It is extremely compact, using literally an inch of bow and the violinist's complete arm-weight, creating a sensation of having the bow glued to the string. The vertical component is the same as the vertical component of spiccato, dropping the forearm, hand, and bow as a unit, against the plane of the string. The repeated drops are each in the same direction, usually down-bow, rather than alternating down-bow and up-bow like spiccato, with often the final one up-bow. Each drop should occur in the same place of the bow, sounding extra percussive until combined with the horizontal component.

The horizontal and vertical components can be combined similarly to spiccato, playing the horizontal and vertical components separately in alternation, beginning slowly and increasing the tempo upon each repetition of the two. Ultimately, there will be only one vertical gesture for ricochet, occurring on the first note of the bow-stroke, but at a slow tempo, there should be a gesture on every note. Practicing with a vertical gesture on each note helps the hand feel the sensation of the bouncing bow, which will assist in controlling the ultimate number of bounces when there is only one gesture. As the repetitions get faster, and the horizontal and vertical components blend together, the
horizontal component should take over, except for the one vertical gesture to begin the bow-stroke, and the hand should remain sensitive to the articulation of each note.

Martelé

Martelé is an articulated bow-stroke that stems from détaché. Literally “to hammer,” each bow-stroke has its own articulation and impetus. The martelé-stroke begins from a rested position with the violinist’s arm-weight settled on the bow so the bow-stick touches the bow-hair. After catching the string, the bow is pulled by the violinist’s forearm like an individual brisk détaché-stroke. Some of the arm-weight is released as the bow is pulled, releasing the bow-stick from the bow-hair. While the motion of the bow-arm is similar to détaché, the fingers are firmer in martelé, catching the string and anticipating the motion of the bow, rather than following it. The arm-weight and finger “catch” must be reset between each note.

Up-bow and Down-bow Staccato

Up-bow and down-bow staccato are essentially repeated small martelé-strokes continuing in one direction. Each note should begin from a rested position with the violinist’s arm-weight settled on the bow, causing the bow-stick to touch the bow-hair. The elbow contributes to the bow-stroke similar to a martelé-stroke, pulling the forearm inwards for up-bow staccato and outwards for down-bow staccato, causing the bow to move horizontally either way. The arm-weight should be released upon the motion of the bow-arm, letting the bow-stick come away from the bow-hair, but should be reset for each note. Even though the bow moves in the same direction for the subsequent notes, it
is important that each note has its own impetus and does not “piggy-back” on a previous one.

**Three-note and Four-note Chords**

Chords can be played many ways with the bow, from sounding all notes at one time, to sounding a couple of notes at a time, to sounding each note one at a time like an arpeggio. Violinists should have the versatility to play chords in any manner and not be restricted by perceived limitations of the instrument. Many violinists consider sounding all notes of three-note and four-note chords at one time difficult, if not impossible, due to the curvature of the bridge and tension of the strings on the violin. Understanding how the violin and bow function, and what is required to sound multiple strings simultaneously with the bow, is fundamental to conquering this difficulty.

The principles of producing sound from multiple strings simultaneously are the same as producing sound from one string at a time. In order for the strings to vibrate, the bow must catch the strings, and upon pulling across them, release them. Since every string is a different thickness and has its own plane across which the bow travels, selecting the amount of arm-weight to use, identifying appropriate sounding-points, and choosing a proper plane for the bow to be drawn across are essential to successfully executing these chords.

In order to play all strings of a chord at one time without “rolling” or “breaking” the chord, the bow must be drawn across only one plane. The middle plane of the combination of strings is the appropriate level to sound all of the strings. For a three-note
chord, the plane of the middle string is used; for a four-note chord, a plane between the A-string and D-string is used.

Placing the bow on the appropriate plane will not itself create contact with all of the strings of the chord. The curvature of the bridge makes it necessary for some strings to be depressed significantly to place them on the same plane. The use of arm-weight and choice of sounding-point make this possible. The tension of the strings is greatest near the bridge and lessens towards the fingerboard. Selecting a sounding-point that is generally closer to the fingerboard will allow the arm-weight to depress the strings, putting them on the same plane.

In addition to a general sounding-point closer to the fingerboard, each string has a different optimal sounding-point related to its thickness, with the G-string sounding best closer to the fingerboard and the D-string, A-string, E-string sounding best incrementally closer to the bridge. In order to get the best sound from all strings, therefore, the bow will need to be angled slightly with its tip further from the bridge than its frog.

Three-note and four-note chords require a significant amount of arm-weight to depress the strings with the bow, making it possible to catch all of them and cause them to vibrate. The fingers of the bow-arm serve as shock absorbers, providing a cushion at the point of contact with the strings, allowing the strings to vibrate when the bow is drawn across them. The fingers still follow the bow, reacting to the resistance that causes the strings to vibrate.

While it is most common for these chords to be played on a down-bow, the principles are the same for playing them on an up-bow. It is slightly more difficult on an up-bow since the bow starts further from the frog where it has less weight of its own.
The motion of pushing the hand across the strings for the up-bow also requires more effort than pulling the down-bow with the elbow. It is still entirely possible to play these chords with an up-bow, however, if all of the principles described above are utilized.

Often three-note chords appear in succession with repeated down-bows. Following all of the guidelines above, it is best to approach these chords with the bow in a circular manner towards the violin, as though “scooping out” the back of the violin. The release of the chords should also be circular, finishing in the shape of a U to release the sound and allow the strings to continue ringing. Even though this bow-stroke is in the lower half of the bow, the elbow should open on the down-bow and close on the up-bow, similar to détaché, keeping the bow moving parallel to the bridge. The motion of taking the bow back to its frog in preparation for the following chord can be included in the release of the initial chord. While this can be achieved by completing the shape of a circle with the bow, it is more efficient to retake the bow with less of a curve. The shape of an oval more accurately reflects the most economical motion of playing the chord and retaking the bow. For chords in quick succession, violinists often speed up the entire gesture of playing the chord including the motion of retaking the bow, however, this tends to make the chords sound choppy. The retake can afford to go faster without compromising the sound of the chords. In order to master the coordination of a faster retake with a slower bow-speed, the motions should be practiced with exaggerated speeds. Play the chord with as slow a bow-speed as possible and return to the frog as fast as possible. Extra time should be taken before each subsequent chord, in order to settle and prepare everything for the next chord.
Chapter 2: The Left Hand

Stopping the Strings

There are two points that hold a string, between which the string vibrates, when set in motion; these points establish the length of the vibrating string, resulting in the pitch. Open strings vibrate between the violin’s bridge and the violin’s nut, the raised section between the fingerboard and the scroll of the violin; other pitches vibrate between the violin’s bridge and a finger of the violinist’s left hand, replacing the nut as the stopping point and shortening the length of the vibrating string. In essence, the fingers of the left hand cause different pitches on the violin by their placement on a string, or their removal from a string, shortening or lengthening the vibrating string. The left hand’s primary function in playing the violin, therefore, is to provide one of the stopping points, determining the length of the vibrating string.

With the exception of left-hand pizzicato, the fingers of the left hand are not required to produce sound. Unlike a piano, where the action of pressing a key directly results in producing a sound, placing or picking up fingers on the violin does not contribute to producing sound; therefore, there does not need to be a corresponding left-hand action for every sound produced on the violin. In addition, considering that only a vibrating string and only the part that is vibrating produces sound, fingers can cover more than one string at one time, and there can be more than one finger resting on a string at the same time.
Natural Hand Position

The forearm, wrist, and hand function as a unit, supporting the actions of the fingers of the left hand. Their most natural position exists with the arm hanging at the side of the body; the forearm and hand are in alignment, without any bend in the wrist, and the fingers are naturally curved with a slight bend in the knuckles. Straightening the fingers or bending the wrist requires tension in the hand and forearm, creating an unnatural position.

In order to establish the natural position of the left hand for playing the violin, lift up the left-hand unit, bending at the elbow like a bicep curl, without disrupting its alignment. The knuckles of the fingers will bend more in this position as a result of gravity. This is the most natural position for the execution of left-hand techniques (Fig. 19).

Often violinists' left hands get out of alignment while playing, a result of lazy habits and/or unnecessary tension in the hand. It is possible to regain the natural hand position without having to remove the hand from the violin. Hanging the forearm and hand from the fingers on the fingerboard drops everything into alignment. The wrist straightens and it becomes impossible for the hand to squeeze (Fig. 20).

Fingers on the Strings

Since the fingers are curved, their most natural position while playing the violin is resting on the strings. Having multiple fingers on the strings at one time also is helpful for good intonation and efficient technique. Placing the fingers on the strings together whenever possible, rather than one at a time, whether on the same string or on a different
string as the music dictates, serves two functions: it creates a framework in which the fingers “know” their placement in relation to each other, and therefore, a basis for good intonation; and it reduces the number of motions for the left hand, using one motion to place multiple fingers on the strings, rather than several motions to place each finger one at a time.

The most secure intervals for the fingers of the left hand are half-steps and whole-steps since they are small intervals that can be played with adjacent fingers. Placing the four fingers in a framework made up of these intervals provides a reference for each finger to play in tune. Within one position, all of the intervals from a minor-second through an octave can be reduced to a combination of half-steps and whole-steps using the four fingers on either the same string or adjacent strings. The intonation for each interval will be more secure if the fingers only have to play half-steps and whole-steps. Using one finger at a time, only actual half-steps and whole-steps are very secure. Any larger interval will not be as reliable because of the greater distance between the two fingers that are used. For example, the perfect-fourth interval exists between the first finger and the fourth finger on the same string within a position. There is a large distance between these fingers, leaving much margin for error. This interval can be reinterpreted as a combination of several smaller distances, however; using the second and third fingers as well, the violinist can reduce it to a series of half-steps and whole-steps. Filling in this large interval with several smaller intervals defines the distance between the first and fourth fingers in terms that the fingers of the left hand “understand,” reducing the margin for error significantly. In practice, the second, third, and fourth
fingers should be placed on the string simultaneously in some half-step/whole-step configuration.

The notion of placing multiple fingers on a string simultaneously is also one of left-hand efficiency. The left hand will be able to work more quickly if there are fewer things for it to do. With fingers already on a string, playing a lower note on the same string in the same position requires only the removal of the higher fingers. If the lower finger is not already on the string, then it needs to be placed on it in addition to the removal of the higher fingers, adding a task for the left hand. This not only causes the left hand to function more slowly, but also requires extra coordination, lifting and placing fingers simultaneously. This is difficult to do without disrupting the sound if the string is vibrating throughout this process. The most efficient and precise technique for the left hand anticipates when fingers will be used and has them prepared to play ahead of time, either by having them already on the strings or by placing them on the strings during another requisite left-hand action. For example, when moving to a finger that is not adjacent, all of the fingers in between can be placed on the strings simultaneously, in the event they may subsequently be used. While the action of placing multiple fingers on the strings together, instead of one at a time, may require more brainpower until it becomes a habit, it actually requires less physical effort. It is much harder to move a finger individually than it is to move them as a group.

The fingers also need not actively press on a string; the weight of a finger is enough to depress it. There should be even less pressure in the extra fingers that are resting on a string, as the weight of the forearm unit should be balanced towards the primary finger that is being used.
Finger Action

The fingers are naturally curved at the knuckles. They require tension to straighten, and therefore should remain curved for a natural left-hand technique. The knuckles closest to the fingernail should be bent at approximately a forty-five degree angle to ensure a good posture for the fingertip on the string (see "finger postures" below). The middle knuckles will be bent close to a ninety-degree angle, depending on the length of the fingers. The base knuckles, joining the fingers to the hand, serve as hinges around which the fingers pivot, moving away from the strings and back. The base knuckles are the only ones that move, the others remaining intact to create a stable finger unit.

Pulling the fingers away from the strings is a significant action, since the natural position for the left hand is with the fingers resting on the string. The base knuckles pull back the fingers like "knuckling" with the middle knuckles, similar to the way an elbow swings back around a shoulder hinge when "elbowing." The finger unit remains the same, without the other knuckles moving, so as not to require any extra unnecessary effort. The fingers return to the strings with motion initiated from the base knuckles. The sensation is one of throwing the finger units towards the strings from the base knuckles. This motion is most efficient, requiring only an initiating impulse that is immediately released. It is similar to throwing a ball, sending it off without controlling every part of its journey or arrival at the destination. By comparison, reaching with the tips of the fingers and placing them at their destination requires effort throughout, and will inhibit their ability to play quickly.
Finger Postures

The postures of the fingers vary depending on the context, but their most relaxed posture resembles the curve of the knuckles described above, while the fleshier parts of the fingertips make contact with the strings. The fingertips can make contact with the strings on their extreme tips or their fleshier parts by moving the hand vertically up or down in relation to the neck of the violin. Moving the hand up will ensure that the extreme tips of the fingers make contact with the strings (Fig. 21); moving the hand down will place the fleshier parts of the fingertips on the string (Fig. 22).

While the number of different finger postures is too great to outline comprehensively, there are some general considerations that help determine an appropriate finger posture for a given scenario. The majority of the time, it is best for the fleshier part of the fingertip to make contact with the string, creating a relatively large surface area for the point of contact. This is healthier than playing on the extreme tip of the finger, which has a small surface area, because of the pressure involved. On the tip of the finger, the pressure is focused on a small surface area; considering the amount of contact the finger has with the strings over the course of a violinist’s life, using this exclusively can lead to nerve damage in the tip of the finger. Playing with the fleshier part of the fingertip spreads the pressure over a larger surface area, reducing the amount of pressure on any one spot. The distribution of pressure over a larger surface area also assists with sliding the finger along the string, used for changing positions and for expressive purposes.
Finger posture may also be determined by the amount of vibrato desired. The fleshier part of the fingertip assists with vibrato because it provides a larger surface area on which the finger rolls. It also ensures that the knuckle closest to the fingernail is not aligned above the point of contact with the string, allowing it wiggle, which is essential to executing vibrato. Using the extreme tip of the finger, however, aligns the knuckle closest to the fingernail directly above the point of contact with the string. This causes that knuckle to “lock” from being in line with the vertical pressure of the finger on the string, impeding the vibrato.

Finger postures sometimes change to accommodate the different distances of the intervals on the violin. The intervals are smaller when a string-length is shorter. As a result, there is less space to place the fingers on a string in the higher positions. In this instance, a good finger posture is with the finger more on its tip.

Another instance in which playing more on the tips of the fingers is better suited than playing on the fleshier parts is for fast passagework. When the fingers are on their tips, they are aligned above the strings; when they are on their fleshier parts, they are more to the side of the strings. It takes less effort to move the fingers from above the strings as a result of gravity; this force assists in dropping the fingers to the strings from above, but causes extra effort to move them to the strings from the side.

Intonation

The most important requirement for good intonation is that the violinist’s ear demands it. It is not enough to hear that something is out of tune; there must be some motivation to change it. Once the violinist has developed a discriminating ear, the
technique for playing in tune on the violin is really quite simple: knowing the half-steps and whole-steps within a position, and shifting between positions.

Playing the violin involves so many variables that there needs to be consistency in the technique for playing in tune. The position of the hand and choice of finger posture should be reliable, and they should help establish a framework for learning the half-steps and whole-steps within a position. The technique of playing in tune requires the knowledge of a note’s placement relative to points of reference. A finger “knows” where to be placed relative to another finger, with a certain posture and a certain hand position. If any of these variables change, the reference point for that finger is no longer the same, and playing in tune becomes more difficult.

From finger to finger, the reference points are the intervals of a half-step and a whole-step, the half-step generally requiring the two fingers to be touching each other, and the whole-step having a space between them. These intervals must be learned because they are the cornerstones of good intonation on the violin. As Galamian alludes to in his treatise, some larger intervals performed on neighboring strings within a position can be interpreted as half-steps and whole-steps. Using adjacent fingers, the perfect-fourth and major-sixth intervals across strings are equivalent to whole-steps, and the tritone and minor-sixth intervals are equivalent to half-steps. Extending this premise further, one can reduce many other intervals to some half-step/whole-step configuration. For example, a minor-seventh between the first finger on the D-string and the third finger on the A-string can be reduced to a half-step plus a whole-step; the second finger can be placed the distance of a half-step from the first finger, but on the A-string, and the remaining distance between the second and third fingers will be a whole-step. Similarly,
a major-third performed with the first finger on the A-string and the third finger on the D-string can be reduced to the same half-step/whole-step configuration; the second finger can be placed a half-step from the first, but on the D-string, and the remaining distance between the second and third fingers will be a whole-step. These principles can be used to determine the distance of any interval within a position, including across multiple strings. In addition, the half-step/whole-step configuration can be in any order that best suits the specific circumstance. Ultimately, using the other fingers to fill in a distance between non-adjacent fingers with half-steps and whole-steps, whether on the same string or another one, reduces the number of intervals for the left hand to “know.”

The shape of the violin requires that the hand position and the finger postures change from the lower positions to the higher ones. For the highest positions, the natural hand position discussed above is impossible to maintain, and the wrist must bend to move around the body of the violin. The intervals also become smaller as the string-length shortens, making it necessary to change the finger postures. These adjustments establish new reference points for the higher positions, and they will similarly assist with the intonation, as long as they are consistent for their respective positions.

Exceptions to this technique for playing in tune on the violin occur when the notes do not all fit within a half-step/whole-step configuration, or when it is not prudent to have multiple fingers down together. Extending a finger, either above or below its normal position, creates a larger distance than a whole-step between adjacent fingers (see “extensions” below); keeping all of the fingers on the string is not always helpful in this instance. Some violinists also have difficulty playing half-steps in tune in the higher positions with more than one finger on the string because their hands are too large. This
is another situation in which it would be better not to enforce a rigid rule. Knowing the exceptional cases and anticipating their occurrence is equally a part of the technique for playing in tune.

**Shifting: Understanding the Shift**

Shifting is the manner in which the left hand moves from one position on the violin to another. A shift travels from a finger in a position, on that finger, to the same finger in a new position. A change of position that begins with one finger and ends with a different finger is not itself a shift; rather, the shift is disguised by the change of fingers. In order to shift, the violinist must determine what finger to use and how far that finger must travel. A shift, therefore, is always from first finger to first finger, from second finger to second finger, from third finger to third finger, or from fourth finger to fourth finger. Whenever the music requires a different finger to be played in the new position, it is necessary to figure out first what is the real shift—that is, the distance traveled on one finger to the new position.

When a shift occurs between a finger in the original position and a different finger in the new position, either finger may be used for the shift. One of the fingers will always be a better choice, technically; but musical as well as technical features also should be considered. The following describes the better technical choices.

For ascending shifts between a finger in the original position and a different finger in the new position, it is best to shift on the lower of the two fingers, regardless of whether the lower finger is the original note or the new note. This will provide the most efficient means of shifting, and ensure that no pitch is heard above the intended note in
the new position. For example, a shift between the first finger in the original position and
the third finger in the new position should occur on the first finger. The shift is from the
first finger in the original position, to the first finger in the new position. Once in that
position, the third finger is placed on the intended note. The intermediate note created,
the first finger in the new position, is a guide-note that defines the actual shift. If the
third finger serves as the shifting finger in this instance, it requires placement on the
string first, which is more cumbersome. The first finger is already on the string, making
it the better technical choice.

For an ascending shift between the third finger in the original position and the
first finger in the new position, it is still best to shift on the first finger. The third finger
can be removed, uncovering the first finger, which should already be on the string,
creating a guide-note that defines the shift. The shift, therefore, is again from the first
finger in the original position to the first finger in the new position. The first finger is the
better choice for this shift as it arrives in the new position on the intended note. A shift
on the third finger would require the finger to travel beyond the intended note, sounding a
higher pitch before completing the shift.

For descending shifts between a finger in the original position and a different
finger in the new position, it is best to shift on the last finger played in the original
position, whether it is the higher one or the lower one. This also will provide the most
efficient means of shifting, and ensure that no higher pitch will be heard before the shift.
If the last finger in the original position is the higher finger, it is picked up upon arriving
in the new position; if it is the lower finger, the new finger is placed on the string upon
arriving in the new position.
It is beneficial to practice shifts between a finger in the original position to a different finger in the new position with audible guide-notes since they help define the finger with which to shift and the distance of the shift. Hearing the actual shift also allows the ear to help determine the correct distance. Guide-notes are an integral part of shifting, and they should always be played, even though they are not to be heard in context of the music. The only difference between a shift with an audible guide-note and an inaudible one is coordination. Removing or placing a finger at a specific time, sometimes in conjunction with changing the direction the bow travels, determines whether or not the guide-note will be heard.

An exceptional situation in which it is not possible to shift on a finger occurs when the note before the shift is an open string. In this instance, it is still helpful to practice the shift on a finger from the original position to the new position to “teach” the shifting mechanism how far to move. In practice, the shifting mechanism completes this shift without the assistance of a finger on the string.

**Shifting: Understanding the Mechanism**

The action of shifting can be reduced to two principles: the forearm, wrist, and hand move together as a unit; and the pressure in the fingertip is released during the shift.

The forearm, wrist, and hand, in their natural hand position, move as a unit during a shift by opening and closing the elbow like a bicep curl. The elbow serves as a gauge for the shift, “knowing” the distance between the forearm and the upper arm for each respective position. Since each position can be identified by the amount the elbow is
opened or closed, it is helpful to pay attention to the elbow to learn the distance of a particular shift.

The shifting motion is initiated in the forearm, and moves the entire forearm unit together. The wrist should remain in the natural hand position unaltered. Bending the wrist during the shift makes it impossible for the forearm unit to move together, and it eliminates the possibility for the elbow to serve as a gauge. It creates three elements without a common point of reference for the motion: the hand, the forearm, and the upper arm. With the forearm unit intact, there are two elements with a common point: the forearm unit and the upper arm joined at the elbow.

Shifts occur at different speeds depending on their context. Regardless how fast or slow, the speed of a shift should remain constant throughout. Any variation in the speed of a shift from its beginning to its end will cause the motion to be jerky, drawing attention to the shift and often resulting in an unsuccessful arrival. The most successful shifts are the ones that are performed most calmly. In addition to maintaining one speed throughout, a shift will be calmer if the arm anticipates its journey. The motion of a shift should be anticipated on a prior note, leaning with the forearm unit in the direction of the shift, rather than waiting and moving at the last second. This will put the forearm unit in motion and at its proper speed sooner, and will allow for it to travel less hurriedly by elongating the time in which the arm has to complete the shift. In passagework that requires several shifts in a row, the forearm unit must constantly anticipate its next destination, causing it to be in continuous motion, never taking time to rest in any one position.
A shift is essentially a coordinated inaudible slide on a finger. The fingertip should remain in contact with the string the entire time. It is easier for a finger to travel along the string on the fleshier part of its fingertip, as it distributes the finger-pressure on the string over a large surface area. The main difference between a shift and a slide is that the pressure in the fingertip is released more during a shift. The release of pressure, along with proper coordination and timing, can make a shift inaudible. It is helpful to practice shifts audibly, however, to allow the ear to assist with learning the distance of the shifts, as well as to listen for a consistent shifting speed.

**Supination**

Supination is the natural rotation of the forearm that turns the palm of the hand from facing down to facing up. For the left hand, it is a counterclockwise rotation, and for the right hand, a clockwise rotation. Holding the violin in its playing position, supination turns the left hand from the palm facing the violinist to the palm facing the neck of the violin, bringing the second, third, and fourth fingers closer to the strings. This is a healthy motion that does not cause any physical strain on the body; it can assist with extending the left hand beyond its normal framework, and help maintain good balance among the fingers.

The range of motion for supination is actually quite large, although it can be difficult to discover. Finding the maximum range of motion requires relaxing certain parts of the arm that inadvertently might have tension due the arm’s overall position, holding the violin. The following steps can assist with discovering the full range of supination:
1. Without the violin, hold your arm up with your palm facing you (Fig. 23).

2. Pull your forearm in towards your body while pointing your thumb away from you. Your elbow should relax and move slightly away from the side of your body (Fig. 24).

3. Continue turning your forearm, pointing your thumb away from your body, as far as it will go. The more the arm supinates, the more the elbow relaxes away from the side of your body. As you explore the range of motion, you may be able to go as far as having the back of your hand resting against your chest and your palm facing away. This is obviously much more supination than is ever needed for playing the violin.

Supinating the forearm, placing the fingers closer to the strings, enables the fingers to reach a larger range of notes without shifting; the fourth finger will be able to reach higher, and the first finger will be able reach back further, playing notes that are beyond the normal framework of the hand on the violin.

Supinating also assists the hand playing within a position, enabling the weight of the forearm unit to shift between each finger, from the first finger towards the fourth finger. Without supinating, the forearm and elbow are centered under the first finger, providing support for the entire hand. This makes it more difficult to use the fourth finger since it is far away from this support, leading many violinists to feel as though their fourth finger is simply weak. Supinating a little places the forearm and elbow below the middle of the hand, providing good support for whichever finger is used. The more
the arm supinates, the more the support shifts towards the fourth finger and away from
the first, removing additional stress from the fourth finger and making it feel stronger.

Over the years, many violinists have advocated pulling their elbow in front of
their body in order to assist with stretches in the left hand, and to support the fourth
finger. While this motion brings the fingers closer to the strings as well, it alone does not
bring them as close as supination. In addition, it puts an unhealthy strain on the back and
the back of the shoulder; extensive use of this motion can lead to significant physical
problems. Every violinist is different physically, and that presents unique challenges.
Violinists with smaller hands and arms at times have to find exceptional ways for their
left hand to handle all of its tasks. The healthiest approach is to begin by supinating the
forearm. If this alone does not solve the problem, then the elbow should be moved in
front of the body. It is important this sequence is followed, so the back and shoulder do
not incur unnecessary strain. The motion of supination actually does not engage the
muscles in the back or shoulder at all. In order to move the elbow in front of the body
after supinating the forearm, lift it up, rather than swing it sideways; this will ensure
minimal participation of the back and shoulder.

Extensions

Extensions of the left-hand position are generally used to play a note beyond the
normal position of the hand without actually changing positions. The most common
extensions are the fourth finger extending higher and the first finger extending lower.
Extensions also occur with the second and third fingers, both higher and lower, playing a
note within the octave framework of the hand, the normal distance between the first and
fourth fingers, but using a larger interval than a whole-step between the extending finger and its neighbor. They are used in this manner to play augmented-seCONDS with adjacent fingers. They can also be used as a means of moving to a new position without using a standard shift, by extending the finger to an interval larger than a whole-step, and then adjusting the hand to assume a framework of half-steps and whole-steps around the new note. In addition, extensions can be used at times to create a more desirable posture for a finger or to use a stronger finger on a particular note without changing positions. The third finger is extended often in this manner to be used in place of the fourth finger. In addition to providing more strength, the extended position of the third finger causes the fleshier part of the fingertip to contact the string, creating a more ideal finger posture for using vibrato (see “finger postures” above).

Supination assists with extensions, bringing the fourth finger closer to the fingerboard, enabling it to reach further. It also adjusts the balance in the hand to support this finger. Extending back with the first finger actually causes less strain on the hand than extending higher with the fourth. Supinating the forearm, adjusting the balance in the hand to support the fourth finger, effectively redistributes the extension throughout the hand towards the first finger, making a much healthier extension.

Balancing the Hand to Support the Fingers

The balance of the left hand must constantly shift in order for all of the fingers to function without straining. Any time the weight of the forearm unit is centered solely on one finger, it may possibly constrain another finger that is used. To avoid this, the weight should readjust to support whichever finger is used.
Shifting the balance of the hand is much like shifting the balance of one’s body-weight while standing. With the feet firmly planted on the ground, the body-weight can be centered over anywhere from the heels to the toes. If it is centered over the heels, it is very difficult to reach out for something in front, perhaps even causing a strain on the rest of the body; if it is centered over the toes, it is quite easy to reach for what is in front.

Violinists can shift the balance of the hand between the fingers, from the first to the fourth, like transferring one’s body-weight in the feet from heels to toes. Using the fourth finger while keeping the balance near the first finger is tantamount to reaching for something in front while the body-weight is centered over the heels. The forearm unit should adjust towards whichever finger is used, in order for that finger to have the necessary support.

For the balance of the hand to be centered on each finger that is used, it will constantly move as the fingers change. In order to discover how the balance shifts, it is helpful to hang the forearm unit from the first finger, followed by the second, third, and fourth fingers respectively. Each time the forearm unit hangs from a finger, the balance of the hand supports that finger. The balance will automatically shift to a new finger if the forearm unit continues to hang while switching fingers.

Vibrato

From the time of Geminiani, the use of vibrato has encountered much scrutiny. While many believe that vibrato was only to be used sparingly as a means of expression in the eighteenth and nineteenth centuries, Geminiani’s treatise of 1751 makes reference to using a continuous vibrato (see footnote 34). This was left out of a later edition of his
work,\textsuperscript{97} as it undoubtedly conflicted with many violinists’ perception of the use of vibrato. Not until the time of Kreisler, at the turn of the twentieth century, did continuous vibrato find its way back into violin playing as a standard that continues today. It is used both for expression and to color the sound produced on the violin.

Vibrato consists of a mechanism that slightly lowers and raises a pitch in an oscillating manner. An ability to vibrate well involves understanding the mechanism, and knowing how and when to use it. Ideally, one should not be overtly aware that there is vibrato unless that is the desired effect. Vibrato can be used to change the intensity of a sound, in addition to coloring it. Both require an ability to play many different types of vibrato, ranging from slow to fast, and narrow to wide.

The three fundamental types of vibrato used on the violin are the arm-vibrato, hand-vibrato, and finger-vibrato, each named for the part of the body initiating the motion. Regardless of what type of vibrato is used, the knuckle closest to the fingernail ultimately determines its success. If this knuckle is loose, then the fingertip will be affected by the vibrating mechanism, altering the pitch of the note. If this knuckle is rigid, then no amount of shaking the arm, hand, or finger will cause the fingertip to alter the pitch, and no vibrato will be heard.

The mechanism of vibrato causes the finger to roll below its original pitch and back, repeated many times. The larger the mechanism causing the vibrato, the easier it is to create a wider and slower one; the smaller the mechanism, the easier it is to create a narrower and faster one. There are a great number of combinations of speeds and widths

that constitute vibrato. Complete facility for vibrating with the left hand includes an
ability to use each of the mechanisms individually and in conjunction with each other.

The mechanism for arm-vibrato consists of the forearm, wrist, and hand as a unit, moving like the shifting mechanism, but without actually changing positions on the violin. The forearm unit moves away from the body, towards the scroll of the violin, and returns to its original position like a bicep curl with the elbow acting as a hinge, while the finger maintains its placement on the violin. As a result of moving the forearm unit, the finger elongates and returns to its original position, rolling the fingertip below the pitch and back.

The mechanism for hand-vibrato consists of the hand moving with the wrist acting as a hinge. Similarly to arm-vibrato, the hand moves away from the body, towards the scroll of the violin, and returns to its original position, while the finger maintains its placement on the violin. The finger also elongates and returns to its original position as a result of this motion, rolling the fingertip below the pitch and back.

The mechanism for finger-vibrato is so small that the finger does not elongate and the fingertip does not roll; instead, the finger pulses up and down on a note. It consists of slightly picking up and placing the finger from the base knuckle of the hand, changing the pressure in the fingertip without actually removing it from the string. Varying the pressure in the fingertip changes the surface area of the fingertip that is in contact with the string, slightly altering the pitch of the note. With more pressure, more of the fingertip covers the string, raising the pitch; with less pressure, a smaller area of the fingertip covers the string, lowering the pitch. The difference between where the larger
area of the fingertip stops the string from vibrating, to where the smaller area of the
fingertip stops it, is the amount that the pitch varies with finger-vibrato.

Each mechanism for vibrato should be learned and practiced separately. It is
helpful to practice them beginning at a slow speed until they are mastered. While the
different mechanisms can be learned in any order, beginning with arm-vibrato is logical
since it is similar to the motion used for shifting, providing a relationship from which to
introduce the mechanism. For the best results, each new mechanism should not be
introduced until the previous one is mastered. The following exercise will help develop
the vibrato mechanisms:

1. At a very slow and even tempo, perhaps forty-five to the quarter-note, move the
forearm unit or hand towards the scroll, elongating the finger and rolling the
fingertip so the pitch lowers almost a half-step. Then return the mechanism to its
original position, rolling the fingertip back to the original pitch.* The original
pitch and the pitch a half-step lower should each be the value of an eighth-note,
making this exercise sound like a slow English siren. Repeat four times in
succession.

2. Double the speed of the exercise, so that each note has the value of a sixteenth-
note, repeating eight times in succession and ensuring that the rhythm is very
accurate.

* For finger vibrato, release the pressure in the fingertip without removing the finger from
the string, returning the pressure in an even rhythm as described above. There will not be
much variation of the pitch; rather, the changing pressures will sound like slight pulsing.
3. Repeat in alternation the eighth-note and the sixteenth-note speeds, each for the duration of four beats of the metronome, until this motion is mastered.

4. Once mastered, double the speed of the exercise again, so that each note has the value of a thirty-second note, repeating sixteen times in succession with accurate rhythm. At this speed, the range of motion should be slightly smaller; also, the sensation should change from equal motions back and forth, to mainly returning to the original note, after an initial gesture below the note. Repeat each speed in alternation, from eighth-notes, to sixteenth-notes, to thirty-second-notes, back to sixteenth-notes, and finally to eighth-notes again, each for the value of four beats of the metronome.

5. Finally, approximately double the speed again, narrowing the range of the motion, this time allowing the distinction between the two pitches to be blurred and the oscillations to blend together. The rhythm no longer needs emphasis as the mechanism should already be developed, and now, attention should be given towards coloring the sound. The finger should feel as though it is massaging the string.

After developing each vibrato mechanism separately, attention can be given to changing between the different mechanisms seamlessly. The best way to do this is to begin with a slow, wide, arm-vibrato and increase its speed while narrowing its range of motion. As the vibrato gets faster and narrower, allow the hand-vibrato to take over. Continue increasing its speed and narrowing its range of motion, allowing the finger-vibrato to take over at an appropriate time. It is not necessary to use a larger mechanism
for slower vibrato and a smaller mechanism for faster vibrato exclusively; nor is it necessary for a slower vibrato always to coincide with a wider range of motion, and a faster vibrato with a narrower range. These are the most logical applications of each vibrato mechanism. The performer has the discretion to use any of the mechanisms in any manner to produce a desired result.

**Harmonics**

A resonating pitch on a violin comprises several frequencies: there is a fundamental frequency, the note that is associated with that sound, as well as a number of other subsidiary vibrating frequencies, called harmonics or overtones, that contribute to the sound that is heard. Lightly touching specific points along a vibrating string will cause some of the frequencies to stop vibrating, while others continue. The resulting sound, many times, a changing of the pitch, is a harmonic.

The most common harmonics used on a violin occur at equal divisions of the string, dividing it in halves, thirds, and quarters. Touching each point lightly, partially stopping the vibrating string, results in a different harmonic. The division at the half sounds an octave higher than the fundamental frequency; the division at the third sounds a twelfth higher than the fundamental frequency; and the division at the quarter sounds two octaves higher than the fundamental frequency.

The principles of lightly stopping a string at one of its divisions to create harmonics are the same for any string-length. The length is determined by two fundamental stopped points, between which the string vibrates. The nut and the bridge of the violin are the fundamental stopped points for open strings; the violinist’s finger and
the bridge of the violin are the fundamental stopped points for fingered notes. Since both fundamental stopped points are provided for an open string, the left hand is free to lightly stop the string at any of the divisions that create a harmonic. Harmonics performed in this manner are called “natural harmonics” because the left hand does not have to provide one of the fundamental stopped points. A harmonic performed with the left hand providing a fundamental stopped point, in addition to lightly stopping the string at a division that creates a harmonic, is called an “artificial harmonic.”

Natural and artificial harmonics function in the same manner. The only difference between them is that extra effort is required of the violinist to perform an artificial harmonic, since he must supply both a finger to determine the string-length, and another finger to lightly stop the string at a point that sounds a harmonic.

There are generally fewer artificial harmonics that are possible to be executed on a given note, due to how far the hand can reach. The most common artificial harmonic is at the division of a quarter, since it fits within the natural framework of the left hand. The interval of a quarter-division is a perfect-fourth, which can be played with the first and fourth fingers within a position. The first finger will be heavy on the string, since it is determining the string-length, while the fourth finger will be lightly touching the string, partially stopping its vibrations at its division. The fourth finger can also be used for an artificial harmonic to lightly touch the string at its division of the third, by extending to create an interval of a perfect-fifth between it and the first finger. While this does not fit within the natural framework of the hand, this extension is one that the hand can reach. Stopping the string with the fourth finger at the division of a half is only possible with artificial harmonics for most people in the higher positions, because of the length of the
string. For most, it is too great a reach to touch the string at its midpoint with the fourth finger while holding the first finger on the string in the lower positions. The shorter the string-length, the easier it is to touch its midpoint with the fourth finger. This harmonic is less commonly performed because of the difficulty of its execution.

While it is most common to play artificial harmonics using the first and fourth fingers, they are not the only ones that can be used. The harmonic at the quarter-division can also be played with the first finger stopping the string and the third finger lightly touching the division, or with the second finger stopping the string and the fourth finger lightly touching the division. These fingerings are used simply for convenience, or for passages that include double-stop harmonics.

Performing harmonics successfully involves more than understanding how they work. Precise intonation of the intervals, between the fundamental stopped note and the lightly stopped note at a division of the string, is essential for the harmonic to sound. The respective pressures of each finger on the string can also affect how clearly the harmonic “speaks.” The finger determining the string-length requires significant pressure, while the finger determining the division of the string must remain very light. Finally, the pressure of the bow on the string and the sounding-point with which it is drawn across the string are equally responsible for a successful execution of a harmonic. Despite the fact that harmonics sound “light” and “fluffy,” they speak more clearly when the bow exerts pressure on the string and is drawn with a sounding-point close to the bridge.
Trills

The mechanism for trilling is the same as the action of placing a finger on a string and picking it up. The finger unit remains intact with the knuckles bent, as the base knuckle sends an impetus, either causing the finger to fall toward the string or to be removed from it. Trills can also be performed using a vibrato mechanism, keeping the higher finger close to the string so it touches and pulls away from it upon the motion of the vibrato. Many violinists use this mechanism, believing that it requires less effort and that it enables them to trill more quickly. Trilling with this mechanism, however, does not provide much clarity. In a concert hall, a fast trill executed with a vibrato mechanism will only sound like wild vibrato.

The clarity of a trill comes from using an articulate finger-action for the turns, and defining the end of the trill. Initiating the finger-action from the base knuckle allows the finger to remain relaxed throughout the trill, helping the finger respond quickly and articulately. Similar to an arm’s motion when throwing a ball, the base knuckle sends an impulse to move the finger and then releases the finger towards the string. In essence, the fingertip is thrown at its target by the base knuckle, allowing the finger to relax after each impulse. Many violinists have difficulty trilling because they reach with the fingertip towards the string, involving all of the knuckles of the finger instead of only the base knuckle. This is a complex motion that requires constant tension to control the finger, leaving no opportunity for the mechanism to relax, and making it very difficult for the finger act swiftly.

Often violinists’ trills are unclear because they do not determine precisely when the trill ends. The last turn of a trill defines its ending. Releasing the finger from the last
turn slightly to the side of the violin, like a left-hand pizzicato, articulates the end of the trill. A short trill occurs so quickly that it is important to predetermine exactly how many turns it will comprise, in order to anticipate the release of the last turn. It is unnecessary to predetermine the number of turns for a long trill, as it provides enough time for the violinist to anticipate its ending during the course of the trill.

The following set of principles should help a violinist achieve more articulate trills:

- Use a proper finger-action for a trill, rather than a vibrato mechanism.
- Use slightly more pressure in the higher finger during the trill, ensuring that the lower finger not squeeze the neck of the violin.
- Concentrate on the action of picking up the higher finger.
- Do not try to trill too fast.
- Practice a short trill by fitting in all of its turns early, ending the trill while still holding the main note, making sure to articulate its ending.

**Left-hand Pizzicato**

As its name suggests, left-hand pizzicato is plucking a string using the fingers of the left hand. Similarly to right-hand pizzicato, each pluck has its own impulse. The finger catches the string, and upon pulling across it, releases it, causing it to vibrate. The impulse that pulls the finger across the string comes from the base knuckle, similar to normal finger-action. The difference is that the base knuckle pulls the finger across the string, instead of picking it up from it.
When there are several pizzicato notes in a row using different fingers, each finger should have its own impulse. The impulses for left-hand pizzicato are very fast, allowing the hand to relax between them. At the precise moment of a pizzicato, additional pressure should be added to the fingertip, and the finger should be pulled with great velocity, releasing the string almost immediately. A group of fast descending pizzicatos is ultimately performed using one gesture, which is, the forearm unit pronating, causing the palm of the hand to pull away from the neck of the violin. The fingers should “peel” away from the violin, one at a time, each pulling across the string and causing a pizzicato to sound. In order to maintain some sense of individual impulses for each pizzicato, each note should be practiced separately, similarly to practicing ricochet with the bow, and then put in the context of one gesture.

Conclusion

My intention in writing this manual was to present a new way of conceptualizing violin technique. This is formulated from an understanding of the basic elements that are a part of playing the violin, and which I have related to how the body can contribute in its most relaxed manner. While the techniques described are sound, some readers may not find them universal. There are many different ways to play the violin; violinists over the years have had extremely successful results using many differing approaches. The descriptions of the techniques in this manual come from my investigations and curiosities about violin playing, and reflect a multitude of my influences. While I have defined some very fundamental principles, and from them derived some “rules,” I encourage the reader to use judgment in their application. There are always exceptions to rules, and
common sense must always play a part. I believe the true role of teachers is to help their students develop the tools to become their own teachers. My hope is that this manual will help others gain some insight into their violin playing, and perhaps stimulate more thought towards working out any technical issues for themselves and their students.
Appendix

Figure 1
The teacher lifts the student’s bow-arm under the elbow; all of the student’s arm-weight is resting in the teacher’s hand.

Figure 2
The teacher’s other hand is placed under the forearm; the student begins to transfer his arm-weight to the placement of the new hand.

Figure 3
The teacher’s original hand is removed; all of the student’s arm-weight is resting in the teacher’s new hand.

Figure 4
The teacher places his original hand at a new place, causing his hands to overlap.

Figure 5
The teacher has substituted his original hand at the placement of his other one from Figure 2, and moved the other one to a new place.

Figure 6
All of the student’s arm-weight has transferred into his hand; the teacher holds the student’s entire bow-arm using only two fingers in the palm of the student’s hand.
Figure 7
The student transfers his arm-weight onto the bow; the teacher holds the bow against the string.

Figure 8
The violinist's bow-hand is extended, with his palm facing the ceiling.

Figure 9
Placing the bow "upside down" on the palm-side of the fingers, from the tip of the fourth finger, to between the first and second knuckles of the index finger.

Figure 10
The thumb is placed where the curve of the frog meets the stick of the bow.

Figure 11
The second and third fingers curl around the frog; a view of the bow-hold, "upside down."

Figure 12
A view of the bow-hold, "right-side up."
Figure 13
The bow-arm is resting on the bow, on the string, without using the thumb. The bow-stick is directly over the bow-hair.

Figure 14
The position of the bow-arm at the frog; the knuckles of the fingers are bent with the middle knuckles on the same level as the base knuckles.

Figure 15
Holding the bow perpendicular to the ground.

Figure 16
The tip of the bow falls away from the index finger, while the third and fourth fingers retract.

Figure 17
The position of the fingers while drawing a down-bow; the knuckles are diagonally bent.

Figure 18
The position of the fingers while drawing an up-bow; the knuckles are diagonally elongated.
Figure 19
The natural position of the left hand; the hand, wrist, and forearm are in alignment, and the fingers are curved.

Figure 20
The left hand is hanging from the violin, dropping the hand, wrist, and forearm into alignment.

Figure 21
The left hand is positioned higher in relation to the neck of the violin, causing the tips of the fingers to make contact with the string.

Figure 22
The left hand is positioned lower in relation to the neck of the violin, causing the flesher part of the fingers to make contact with the string.

Figure 23
The palm of the left hand is facing the violinist.

Figure 24
The left arm is supinated; the arm is pulled in towards the body, with the thumb pointing away, and the elbow is relaxed, resting slightly away from the body.
Select Bibliography


