Berlioz's Orchestration Treatise

A Translation and Commentary

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Bowed strings

THE VIOLIN

The four strings of the violin are normally tuned in fifths, with the fourth string tuned to *g*, the third to *d′*, the second to *a′* and the first to *e″*. The top string, the *e″* string, is also known as the 'chanterelle'. When the left-hand fingers are not modifying the pitch by shortening the portion of string set in motion by the bow, the strings are termed 'open' strings. Notes to be played open are indicated by an 'o' marked above them.

Certain great players and composers have not felt under any obligation to tune the violin in this way. Paganini tuned all the strings a semitone higher, to *a*♭, *e*♭′, *b*♭′ and *f″*, to give the instrument more brilliance. So by transposing the solo part he would be playing in D when the orchestra was in E♭, or in A when they were in B♭, thus keeping most of the strings open with their greater sonority without having to apply the fingers. This would not have been possible with normal tuning. De Bériot often tunes the *g* string up a tone in his concertos; Baillot, on the other hand, used to tune the *g* string down a semitone for soft, low effects. Winter even used *f* instead of *g* for the same purpose.

Paganini's Violin Concerto in E♭, op. 6, was intended to be played on a violin tuned up a semitone; the soloist is thus playing in D (Mozart used the same scordatura for the viola in his *Sinfonia concertante*, K. 364). This scordatura is also found in Paganini's variations on 'Di tanti palpiti' from Rossini's *Tancredi*.

In his *L'art du violon*(1834) Baillot mentions Paganini's scordatura and also de Bériot's tuning, *a*–*d′*–*a′*–*e″*.[1] He explains his own tuning of the *g* string to *f*♯ and his trick of tuning it slowly down to *d* while still bowing.

The only composition by Peter von Winter (1754–1825) Berlioz seems to have known is *Marie von Montalban* (Munich, 1800), whose overture he commended in 1841.[2] It does not require any retuning of the *g* string. Not even in his concertos

[1] Pierre-Marie-François de Sales Baillot, *The Art of the Violin*, ed. Louise Goldberg (Evanston, 1991), pp. 417–18.
[2] *Jd*, 11 August 1841.

does Winter ever seem to have called for scordatura; Berlioz's claim could be pure hearsay, otherwise the remark remains unexplained.

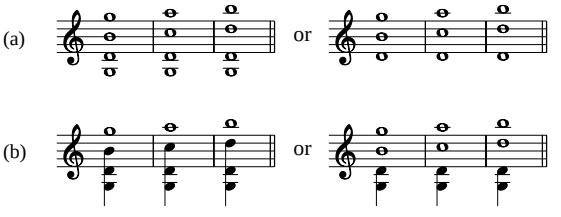
In view of the great agility which our young violinists display today, the range that the violin in a good orchestra may be expected to cover is from *g* to *c''''*, with all chromatic intervals. The great players add a few more notes at the top of the range, and even in orchestral writing one may obtain much higher pitches by means of harmonics, of which more will be said later.

Berlioz respected *c''''* as the violin's top note (except with harmonics, and except for a high *d''''* in Ex. 41b of this *Treatise*). He reached this on several occasions, for example at bar 472 of the first movement of the *Symphonie fantastique* (*NBE* 16: 40) and throughout the *Septuor* in Act IV of *Les Troyens* (*NBE* 2b: 566–74).

Trills are practicable throughout this vast range of three and a half octaves, although one should have due regard for the extreme difficulty of trills on the top *a'''*, *b'''* and *c''''*. My view is that in orchestral writing it would be prudent not to use them. One should also, if possible, avoid the semitone trill on the fourth string, from open *g* to *a♭*, this being harsh and rather unpleasant in effect.

Chords of two, three or four notes which can be struck or arpeggiated on the violin are very numerous and quite different in effect one from another. Two-note chords, produced by what is called 'double-stopping', are suitable for melodic passages, sustained phrases either loud or soft, also for all kinds of accompaniment and tremolo. Three- and four-note chords, on the other hand, produce a poor effect when played *piano*. They only seem rich and strong in *forte*, otherwise the bow cannot attack the strings with enough impact to make them vibrate simultaneously. Do not forget that of these three or four notes two at the most can be sustained, the bow being compelled to quit the others as soon as it has struck them. At a moderate or slow tempo it is therefore useless to write Ex. 1a. Only the upper two notes can be sustained, so it would be better in this case to notate the passage as in Ex. 1b.

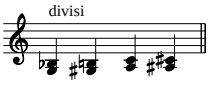
Ex. 1



All chords contained between low *g* and *d'* are obviously impossible, since there is only one string (the *g* string) with which to produce two

notes. When you need harmony at this extreme end of the range it can only be obtained in orchestral music by dividing the violins, shown by the Italian term 'divisi' or the French terms 'divisés' or 'à deux' written above the notes. The violins then divide so that some play the upper part, the others the lower part, as in Ex. 2.

Ex. 2



Above d', the third string, all intervals of a second, third, fourth, fifth, sixth, seventh or octave are practicable, except that they get progressively harder the further up the top two strings you go:

	easy	progressively harder from
seconds	c'–d' up to g''–a''	a''–b' upwards
thirds	b–d' up to f''–a''	g''–b'' upwards
fourths	a–d' up to e''–a''	f''–b'' upwards
fifths	g–d' up to e''–b''	f''–c''' upwards
sixths	g–e' up to f''–d'''	g''–e'' upwards
sevenths	g–f' up to e''–d'''	f''–e''' upwards
octaves	g–g' up to e'–e'''	f''–f''' upwards

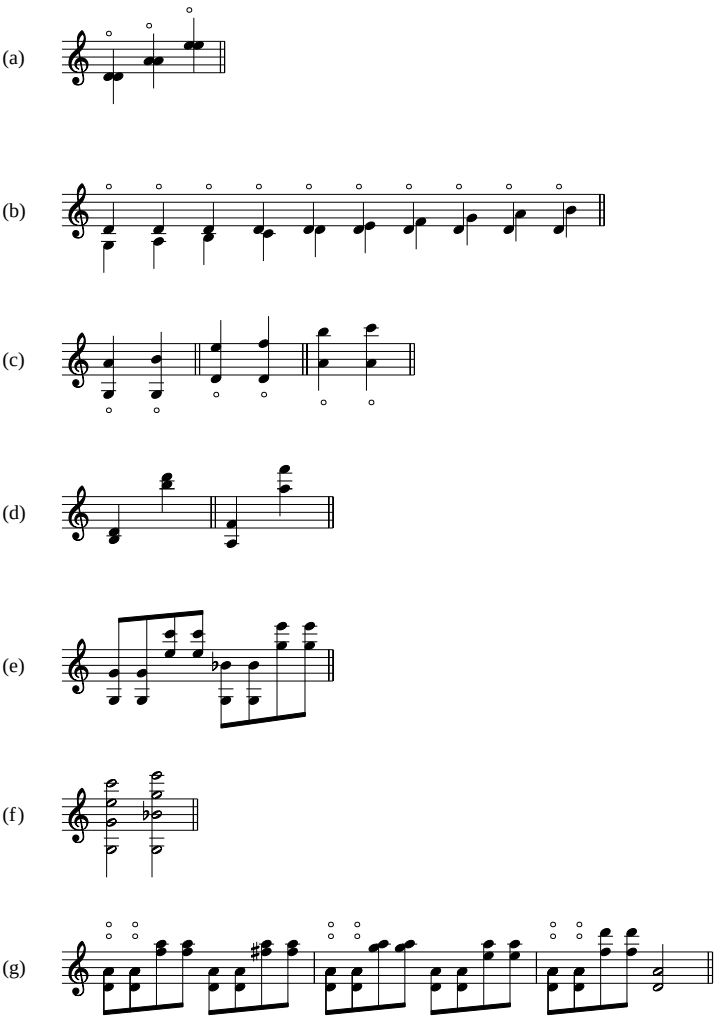
The double-stopped unison is sometimes used, but although it can be executed on many other notes it is as well to confine its use to the following three – d', $a'$and e'' – since only these are sufficiently easy to sound well and produce a variety and strength of sound resulting from the fact that one of the two strings in each case is open (see Ex. 3a). In other unisons, such as e', f', g', b', c'' and d'', there is no open string; they are rather difficult to play and so are very rarely played in tune.

A lower string may cross a higher open string going up the scale while the open string acts as a pedal (see Ex. 3b). The d' here remains open while the rising scale is played throughout on the fourth string.

Intervals of a ninth or tenth are feasible but much less straightforward than narrower intervals. It is better not to write them at all in orchestral parts unless the lower string is open, in which case there is no risk (see Ex. 3c). Double-stopped leaps requiring large shifts of the left hand should be avoided, being exceedingly difficult, if not impossible (see Ex. 3d). In general one should not write such leaps unless the upper two notes belong to a four-note chord which could be struck as one. Ex. 3e is feasible because the chords in Ex. 3f can be struck as single four-note chords. In the next example, Ex. 3g, on the other hand, the four notes of each group (except the last) could only be played simultaneously

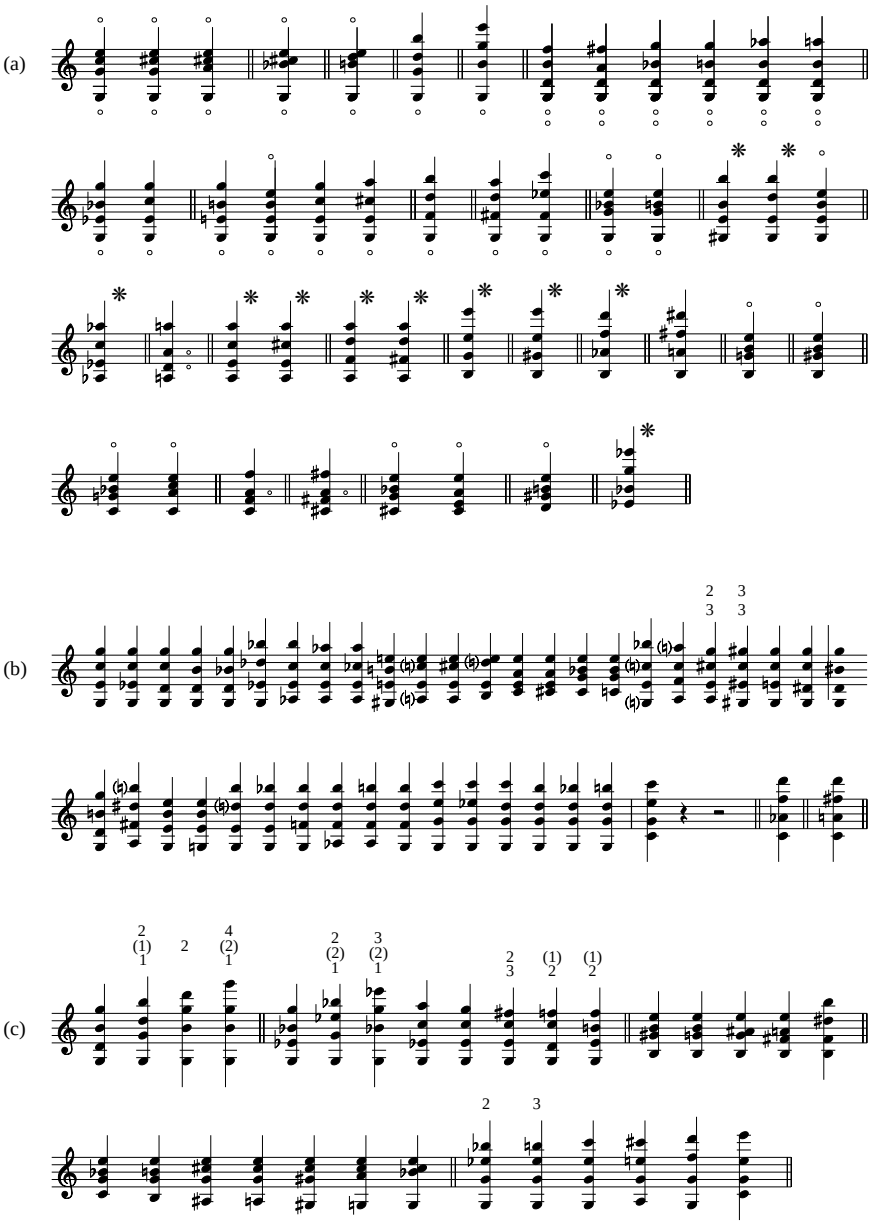
with some difficulty, yet the leap from lower pair to upper pair is actually straightforward, the lower two notes being played open and the other two with the first and third fingers.

Ex. 3



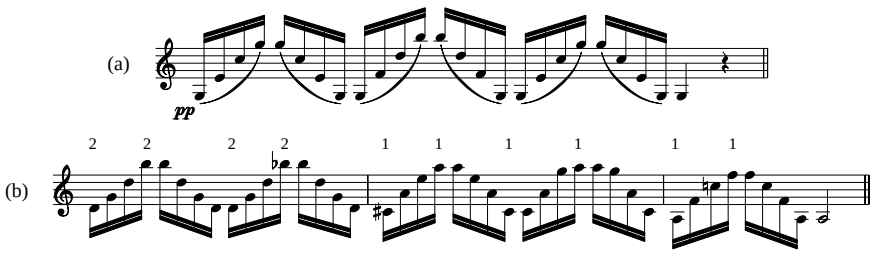
The best and most resonant three-note and particularly four-note chords are always those containing the most open strings. In my view, in fact, it is better to make do with a three-note chord if no open string is available for a four-note chord. Ex. 4a–c sets out the commonest chords. These are the most resonant and the least difficult. For all chords marked * it is better to leave out the bottom note and make do with three notes. All these chords are straightforward, provided they follow one another in this way.

Ex. 4



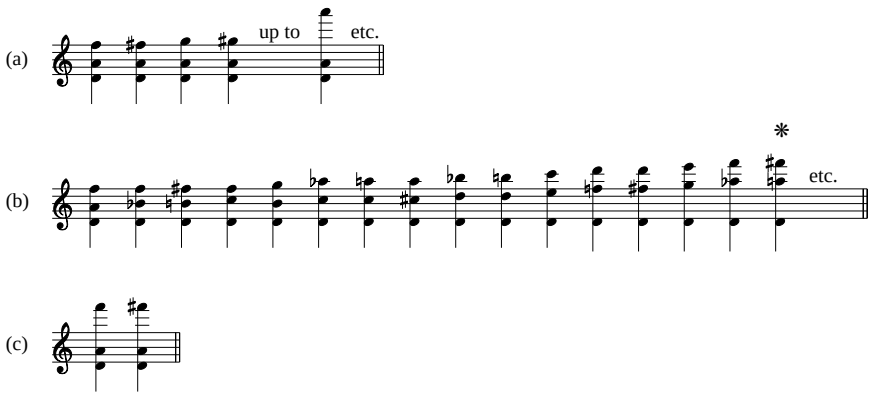
These can be played as arpeggios, that is to say with each note heard in turn, and the result is often very satisfactory, especially *pianissimo* (Ex. 5a); yet there are certain arpeggio passages similar to these whose four notes could not be played simultaneously except with great difficulty, but which are playable as arpeggios by passing the first or second finger across from the fourth string to the first to produce both the bottom and the top note (Ex. 5b).

Ex. 5



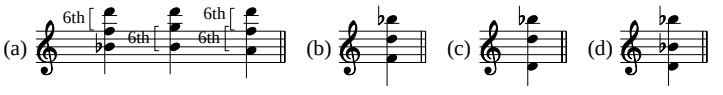
If you leave out the top or bottom note of the chord in Ex. 4, you get the same number of three-note chords. In addition there is the series of chords obtained by various pitches on the *e″* string above the two middle strings played open, or by fingering both the *e″* and the *a′* string above an open *d′* (Ex. 6a–b). If you need an isolated chord of d minor or D major, you must not use the form given at * in Ex. 6b, since it is too difficult when not approached by step. Better write it as Ex. 6c, which is easy and more resonant, with its two open strings.

Ex. 6



It will be seen from these examples that all three-note chords are possible on the violin provided you take care in cases where no open string is available to separate the notes by an interval of a fifth or a sixth. The sixth can be the upper or lower interval, or both, as in Ex. 7a. Some three-note chords can be set out in two ways. It is always better to choose the one which uses an open string. Ex. 7b is acceptable; Exx. 7c and 7d are better.

Ex. 7



The error shown in Ex. 1a was made by Berlioz in the last bar of the *Resurrexit* in the *Messe solennelle* (*NBE* 23: 186), all three notes of an E♭ chord being marked with a pause.

A prominent use of the device shown in Ex. 3a with two strings playing *e″* is found in *Le carnaval romain* (*NBE* 20: 233–4), and at bar 63 of the *Chant des chemins de fer* (*NBE* 12b: 15) all the strings except double basses have a double-string unison *d′* (or *d*). In his *Memoirs* Berlioz commended Meyerbeer's introduction of a two-string unison tremolo *d′* in Gluck's *Armide*, but later added: 'I should not have written that.'[3]

The principle illustrated in Ex. 3b is applied in the viola solo part in bar 72 of the first movement of *Harold en Italie* (*NBE* 17: 15). Ninths and tenths were used by Berlioz only with an open string, as shown in Ex. 3c.

The three sets of quadruple stops, Exx. 4a–c, are none too clearly set out. In the first group Berlioz identifies harder chords with an asterisk, whereas the third group is described as 'easy in moderate tempo'. Chords with no open strings are marked with asterisks, although the first two of these are very hard, the next five are easy; then come two requiring the very difficult octave stretch between third and fourth fingers, then an easy diminished seventh, followed by a much harder stretch with no asterisk. In the third group the pre-penultimate chord (dominant seventh on *a*) is far harder than the rest and may have the note *a* misprinted for *g*.

Berlioz said that he learnt nothing about instrumentation from his teachers,[4] so he must have learnt these chords from a violinist friend (Ernst perhaps?) or from one of the many violin tutors published in France in the early nineteenth century.[5] But the uneven estimate of their difficulty is hard to explain.

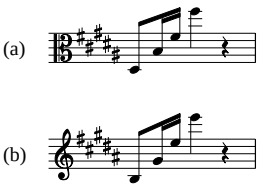
It is also odd that Berlioz offered these as 'straightforward' and suggested they might be freely used in orchestral music when he never wrote any quadruple stops himself with the single exception of an A major chord for the second violins in *La damnation de Faust* (*NBE* 8a: 111). Triple stops are frequent and nearly all reasonably easy: the hardest are found in the *Bacchanale* of *La mort d'Orphée*, the Prix de Rome cantata of 1827 (*NBE* 6: 40–53). Double stops are frequent also; Berlioz implies, by the lack of a *divisi* marking, that each player should play both notes, even though it might be wiser to divide and would be more sonorous. A particular case is his writing of double-stopped octaves in orchestral parts, which will almost certainly sound stronger if divided. This is found at bar 78 of the *Scène aux champs* in the *Symphonie fantastique* (*NBE* 16: 78), bar 62 of the *Marche pour la dernière scène d'Hamlet* (*NBE* 12b: 109), bar 108 of Part I of *La damnation de Faust* (*NBE* 8a: 19) and at bar 367 of the *Scène d'amour* in *Roméo et Juliette* (*NBE* 18: 177). In the solo part of *Harold en Italie* (first and third movements) such double-stopped octaves have of course a quite different effect.

Berlioz's use of broken arpeggios of the kind shown in Ex. 5 is found in storm music such as the *Tempête* fantasy in *Lélio* (*NBE* 7: 89) and in the *Chasse royale et orage* in Act IV of *Les Troyens* (*NBE* 2b: 454). A very problematic example is the accompaniment to Mephistopheles's *Sérénade* in Part III of *La damnation de Faust* (*NBE* 8a: 313–24), where the second violin and viola parts combine pizzicato and arpeggio with the instruction 'Arpeggiate by sliding the thumb over the four strings'. This is the only example, too, of Berlioz giving string fingering (apart from open strings on occasion). He evidently underestimated the great difficulty

[3] *Memoirs*, 'Travels in Germany', I/8. [4] *Memoirs*, chapter 13.
[5] For a complete list see Robin Stowell, *Violin Technique and Performance Practice in the Late Eighteenth and Early Nineteenth Centuries* (Cambridge, 1985), Appendix.

of phrases such as Ex. 8a in the violas and Ex. 8b in the second violins (bar 104) at a speed of 72 bars to the minute. In its earlier version in C major this piece was much better laid out for strings (see *NBE* 8b: 505) with greater use of open strings.

Ex. 8



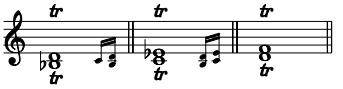
In the *Rgm* text Berlioz had more on the subject of string arpeggios:

> Violin arpeggios are not much used in orchestral music nowadays. The kind written by Grétry and his contemporaries is wretched in design, admittedly, but just because something has been badly done does not mean that it could not be done better. On the contrary, there are most certainly some elegant arpeggios, not too hard to play, which could prove delightful as accompaniment.

He may have been referring to Grétry's *Richard Cœur-de-lion* (revived in Adam's rescoring in 1841), where the violins have arpeggiated variations on Blondel's theme.

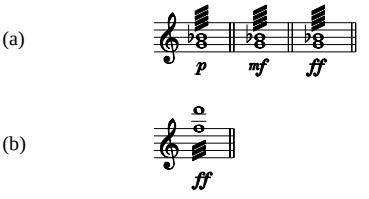
One may write double trills in thirds, starting from low *b*♭ (Ex. 9), but they are harder to play than ordinary trills, and since the same effect is obtained much more neatly by dividing the violins it is on the whole better to refrain from them in orchestral writing.

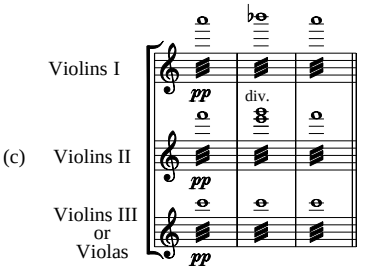
Ex. 9



A body of violins playing tremolo, either single notes or double-stops, produces many fine effects. On one (or two) of the lower three strings and provided it is not much higher than *b*♭′, it expresses distress, agitation or terror depending on whether the dynamic is *piano*, *mezzo-forte* or *fortissimo* (Ex. 10a). Across the top two strings, *fortissimo*, it is stormy and violent (Ex. 10b). High up on the *e*″ string, on the other hand, divided into many parts and *pianissimo*, it becomes angelic and ethereal (Ex. 10c).

Ex. 10





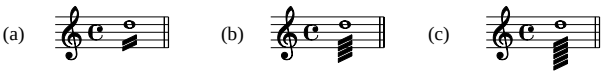
At this point I should say that orchestral violins are customarily divided into two sections, although there is no reason why they should not be subdivided into two or three sub-sections if the composer so desires. One may even sometimes divide them into as many as eight sections with good effect, either by taking eight solo violins playing in eight parts from the main body or by dividing both first and second violins into four equal parts.

Berlioz subdivided his string section in a great variety of ways, into as many as sixteen parts (*Sanctus* of the *Requiem*, *NBE* 9: 122). Part of *Rob Roy* (*NBE* 20: 154) is divided 4–2–2–2–1, and the *Chant de bonheur* in *Lélio* is divided 2–2–2–4–0 (*NBE* 7: 58). The finale of the S*ymphonie fantastique* begins with 3–3–2–1–1 (*NBE* 16: 114), and *Absence* with 4–2–2–1–1 (*NBE* 13: 59). Eight violin soloists (four firsts, four seconds) are required in the *Tempête* fantasy in *Lélio* (*NBE* 7: 70); nine soloists (three firsts, three seconds, three violas) are singled out in *Benvenuto Cellini* (*NBE* 1c: 773). More often he calls for four violin soloists, sometimes four firsts, as in the first movement of *Harold en Italie* (*NBE* 17: 11) and the *Sanctus* in the *Requiem* (*NBE* 9: 122), sometimes two firsts and two seconds, as in *Dans le ciel* in *La damnation de Faust* (*NBE* 8a: 438) and the *Duo-nocturne* in Act I of *Béatrice et Bénédict* (*NBE* 3: 187). *La captive* (*NBE* 13: 11) has an optional second string orchestra.

To return to the tremolo, to bring it off effectively it is important that the bow strokes should be rapid enough to produce a true trembling or shuddering. So the composer must notate it precisely, taking the general pace of the movement into account. Orchestral players, who are only too pleased to be spared a type of playing that tires them, miss no opportunity of avoiding it when they can.

So if, in allegro assai, you write a tremolo as in Ex. 11a, producing repeated semiquavers, there is no problem and the tremolo will happen. But if you leave a tremolo indicated as semiquavers in an adagio, the players will do strict semiquavers and instead of a trembling you will get an abominably gross effect. In that case you must write it as in Ex. 11b, and even sometimes, if the tempo is slower than adagio, as in Ex. 11c.

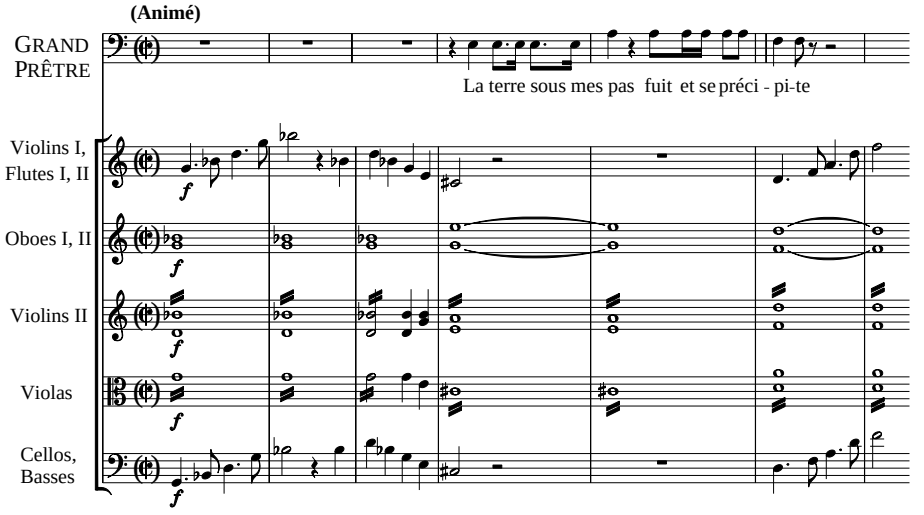
Ex. 11



A tremolo, *fortissimo*, in the lower or middle range on the bottom two strings is much more distinctive if the bow touches the strings close to the bridge. In a large orchestra (when the players take the trouble to do it properly) it produces a noise like a mighty cascade. It requires the indication 'près du chevalet' (near the bridge).

A magnificent example of this kind of tremolo is found in the oracle scene in Act I of Gluck's *Alceste* (see Ex. 12). The shuddering of the second violins and violas is enormously enhanced by the striding, menacing progressions of the bass instruments, the first violins now and then breaking in, the successive entries of the wind, and most of all by the sublime recitative which this orchestral cauldron accompanies. I know nothing else of its kind, so dramatic or so overwhelming.

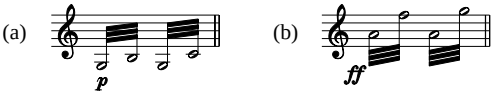
Ex. 12



(It should be said that the tremolo is not marked to be near the bridge in Gluck's score, and the idea should not be attributed to him. All credit should go to M. Habeneck, who called for this feverish style of playing from the violins, so incontestably appropriate in this passage, when he was conducting rehearsals of this amazing scene at the Conservatoire.)

Certain types of dramatic accompaniment, when the mood is very agitated, can be successfully done with a broken tremolo, either on one string or across two, as in Ex. 13 a–b.

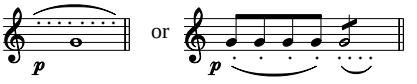
Ex. 13



Finally there is a kind of tremolo now no longer used but which Gluck put to admirable effect in recitative: I call it the 'tremolo ondulé', the

wavy tremolo. It consists of repeated notes at a relatively slow speed joined together without taking the bow off the string. In these unmeasured accompaniments the players cannot all play the same number of notes in the bar; some play less, some more, and the result is a kind of fluctuation and indecision in the orchestra, absolutely right in certain scenes for conveying anxiety and distress. Gluck wrote it as in Ex. 14.

Ex. 14



Tremolo is widely used by Berlioz for the purposes he describes. The ethereal type shown in Ex. 10c is illustrated by bars 28–30 of the *Chant sacré* (*NBE* 12a: 271) and by the introduction to the *Septuor* in Act IV of *Les Troyens* (*NBE* 2b: 565–6). Berlioz sometimes reinforces his advice to be clear in the notation, e.g. marking 'tremolo strettissimo' for Mephistopheles's entry in *La damnation de Faust* Part II (*NBE* 8a: 109) and for Aeneas's departure in *Les Troyens*, Act V (NBE 2b: 649, 658), or 'tremolo très serré' in the *Dies iræ* of the *Requiem* (*NBE* 9: 44) and in Tableau I of *Benvenuto Cellini* (*NBE* 1a: 297). In the prologue of *Roméo et Juliette* Berlioz's notation clearly shows even semiquavers, but the printed parts were marked 'tremolo' (*NBE* 18: 35, 371). Berlioz's criticism of *Rienzi* and *Der fliegender Holländer* was that tremolo was abused in those operas: 'A sustained tremolo is of all orchestral devices the one that the ear tires of most quickly. It calls for no invention on the part of the composer when there is no striking idea accompanying it above or below.'[6]

The indication 'sur le chevalet' or 'sul ponticello' is found in the *Dies iræ* of the *Requiem* (*NBE* 9: 44), the scherzo *Reine Mab* in *Roméo et Juliette* (*NBE* 18: 223), the *Chanson de Méphistophélès* in *La damnation de Faust* (*NBE* 8a: 160) – though not in the version in the *Huit scènes de Faust* (*NBE* 5: 75) – , *La captive* (*NBE* 13: 17), *Le spectre de la rose* (*NBE* 13: 45) and Act I of *Les Troyens* (*NBE* 2a: 56). Berlioz never uses a cancelling instruction such as 'naturale'.

Ex. 12 is the opening of a much longer extract from Act I of Gluck's *Armide*, which Berlioz printed to illustrate the tremolo. This includes a number of tremolos of the kind shown as Ex. 13a, which are also found in *Les francs-juges* (*Chœur de soldats*, bar 155) and at the opening of Act II of *Les Troyens* (*NBE* 2a: 203). He presumably intended the bow to change at the same rapid pace as the left-hand fingers, although bar 11 of the *Les Troyens* passage is slurred over a whole bar, casting doubt on his intentions.

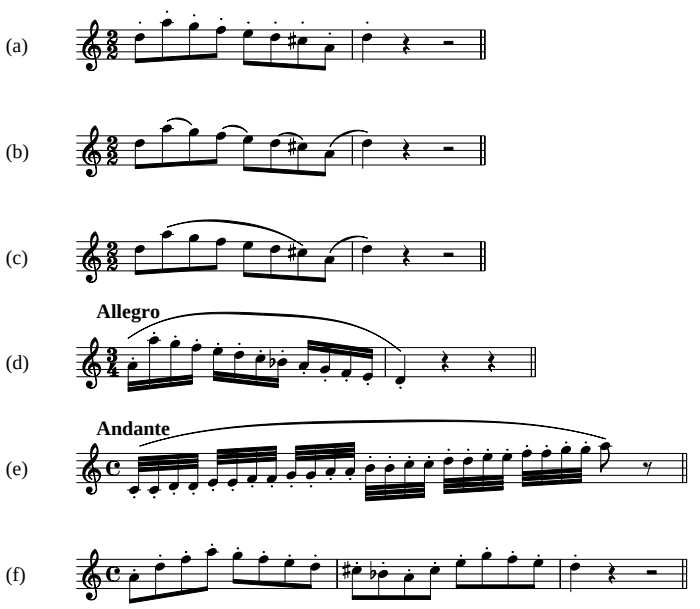
Berlioz later pointed out that Gluck used two kinds of tremolo. A wavy line indicates a form of vibrato, while a series of notes with a slur over them (as in Ex. 14) requires 'the strings to repeat steadily the same note in an irregular way, some doing four notes per bar, some eight, some five, some seven or six, producing a host of different rhythms which spread their imprecision right through the orchestra and create a kind of affecting vagueness which is so often dramatically appropriate'.[7]

[6] *Memoirs*, 'Travels in Germany', I/5. [7] *A travers chants*, pp. 188–9.

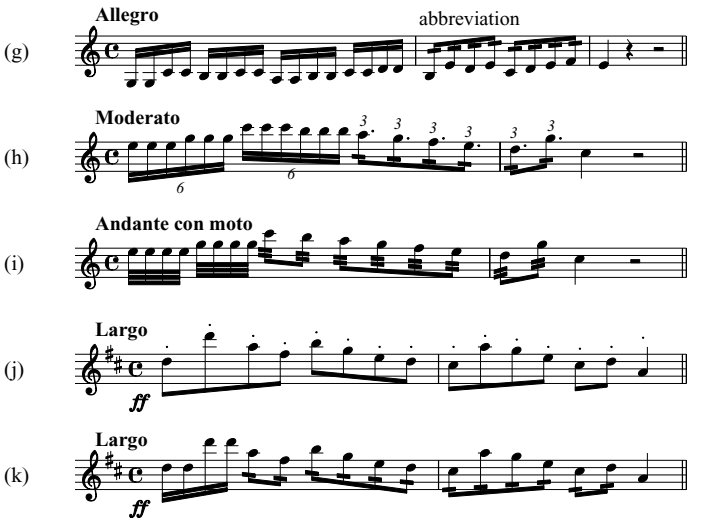
Berlioz used the wavy line tremolo once himself, in *Herminie* (*NBE* 6: 69, 77). Baillot describes a kind of tremolo, termed 'ondulation', produced by the bow alone.[8]

Bowing is of great importance and has a lot of bearing on the sound and expression of phrases and melodies. It must be carefully marked, depending on what effect is intended, using the following signs: *détaché*, as in Ex. 15a; phrased across the beat in pairs, as in Ex. 15b; long slurs, as in Ex. 15c; staccato or light *détaché* bowing, single or double, to be played all in one bow with a series of little jerks moving the bow as little as possible on each one, as in Ex. 15d and 15e; the *grand détaché porté*, which is designed to draw as much sound as possible from the string by leaving it to vibrate after the bow's attack, especially good for pieces of proud and grandiose character, in a moderate tempo, as in Ex. 15f. Notes repeated two, three or four times, depending on the tempo, give more strength and agitation to the violins' sound and are useful for many orchestral effects at all dynamic levels (Ex. 15g, 15h, 15i). But at a broad tempo and in music of forthright character, single notes played with *grand détaché* bowing are much more effective when they are *not* given any tremolo on each note. Ex. 15j is incomparably nobler and stronger in sound than Ex. 15k, in view of the slow tempo.

Ex. 15



[8] See Erich Schenk, 'Zur Aufführungspraxis des Tremolo bei Gluck', in *Anthony van Hoboken: Festschrift zum 75. Geburtstag* (Mainz, 1962), pp. 137–43.



It would be pedantic, in my view, if composers gave bowing indications in their scores, with signs for up and down bows such as are found in violin studies and concertos. But when a passage unequivocally requires lightness, great energy or fullness of sound, it is a good idea to indicate the method of playing with the words 'at the tip of the bow', 'at the heel of the bow', or 'full bow on each note'. The same applies to the words 'on the bridge' and 'on the fingerboard', indicating when the bow should strike the string near or far from the bridge. The metallic, rather harsh sound made by the bow passing close to the bridge is very different from the soft, subdued sound made by letting it cross the fingerboard.

There is a symphonic work depicting the horrible and the grotesque which uses the wood of the bow to strike the strings. This bizarre device should be extremely rarely used and only with proper justification; and it can only be effective in a large orchestra, when the great number of bows cascading on to the strings produces a kind of crackling which would scarcely be heard if there were too few violins, since the sound it produces is so weak and brief.

Berlioz's treatment of bowing is a mere summary of a complex subject widely discussed at the time by authors more expert in violin playing than he. The 'grand détaché porté' was Habeneck's term for a variation of Baillot's *grand détaché*.[9] The phrasing across the beat in Ex. 15b was known as 'Viotti bowing'.[10]

Despite the implication of Ex. 15c, slurs do not necessarily imply bowing in Berlioz's string parts, especially in long phrases where one slur may begin where

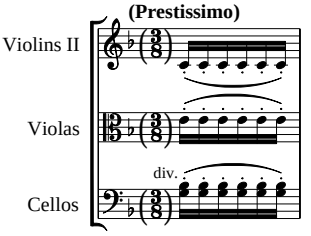
[9] F. Habeneck, *Méthode théorique et pratique du violon* (Paris, n.d.).

[10] See Stowell, *Violin Technique*, pp. 166–201; and Clive Brown, 'Bowing styles, vibrato and portamento in nineteenth-century violin playing', *Journal of the Royal Musical Association*, 113/1 (1998), pp. 97–128.

the previous one ends, a notation known as 'slur-elision'.[11] Berlioz regarded the slur as a notation for legato.

The bounced or 'ricochet' bow-stroke is not mentioned by Berlioz, although it was explained by Baillot in his *L'art du violon*. Berlioz used it in the *Reine Mab* scherzo in *Roméo et Juliette* (*NBE* 18: 182), where the second violins, violas and cellos have Ex. 16 marked 'en faisant rebondir l'archet' ('making the bow bounce'). At bar 136 of the same movement the double bass entry is marked 'en frappant l'archet sur la corde' ('striking the bow on the string'), a kind of *fouetté* effect.

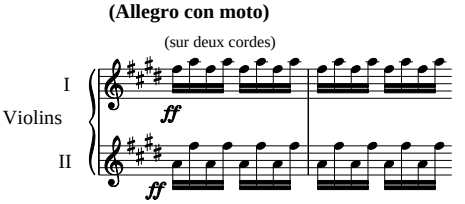
Ex. 16



Berlioz never marked up- and down-bows in his scores. The instruction 'a punta d'arco' (at the point of the bow) is found twice in the *Symphonie fantastique* (*NBE* 16: 6, 114). 'Avec le talon de l'archet' (with the heel of the bow) is found in *Cléopâtre* (*NBE* 6: 142) and in all the strings in the *Rex tremendæ* of the *Requiem* (*NBE* 9: 56). 'Full bow on each note' is not found.

For 'près du chevalet' markings, see above, p. 16. The solo viola is marked 'sul ponticello' for the middle section of the *Marche de pèlerins* in *Harold en Italie* (*NBE* 17: 90). 'Sur la touche' ('on the fingerboard') appears once, at bar 77 of *Le jeune pâtre breton* (*NBE* 13: 29). A special string-crossing effect is used in the last Tableau of *Benvenuto Cellini* (*NBE* 1c: 1074), where Ex. 17 is marked 'on two strings'.

Ex. 17



The 'symphonic work' Berlioz refers to is of course his own *Symphonie fantastique* in whose finale, at bar 444, firsts, seconds and violas are instructed: 'frappez avec le bois de l'archet' ('strike with the wood of the bow') (*NBE* 16: 156). *Col legno* was not a widely used technique at the time. Berlioz was certainly ignorant of Mozart's marking 'coll'arco al roverscio' in his Violin Concerto in A, K. 219, and of the 'col' legno d'arco' in Haydn's Symphony no. 67, but he would have known Boieldieu's *Le calife de Bagdad*, which was in the repertory of the Opéra-Comique in the 1820s. Késie's famous air from that opera, 'De tous les pays pour vous plaire', imitates songs from France, Italy, Spain, Scotland, Germany and England. The

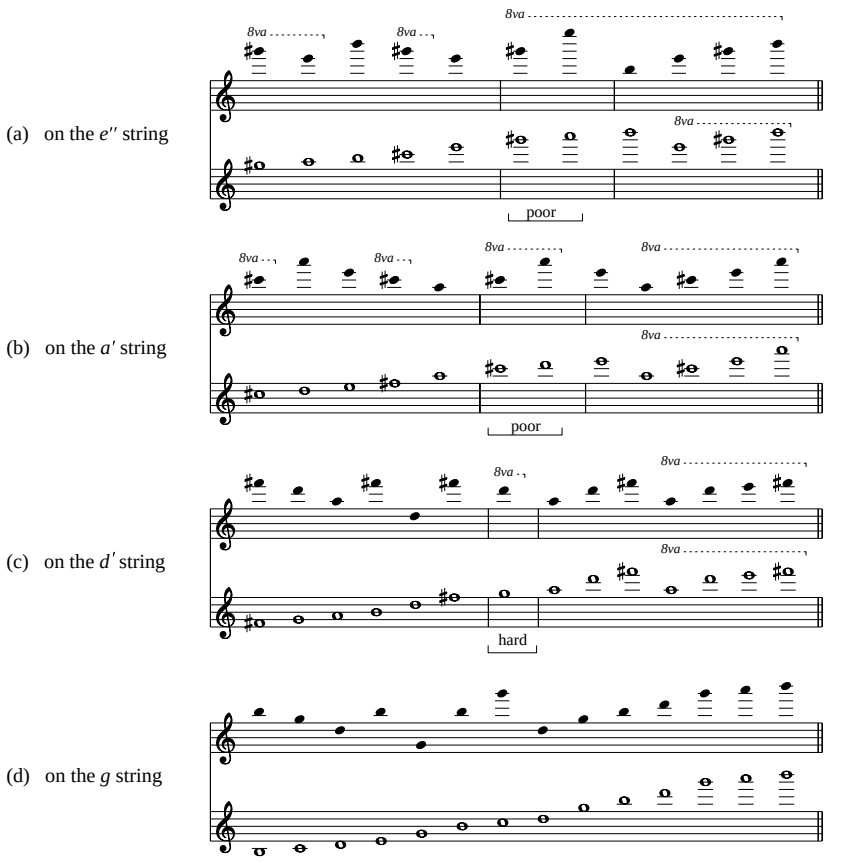
[11] Hugh Macdonald, 'Two peculiarities of Berlioz's notation', *Music and Letters*, 50 (1969), pp. 25–36.

Spanish section has the strings marked 'avec le dos de l'archet'. A similar effect is found in Dalayrac's *Une heure de mariage* (1804), which was also often revived.

In a copy of his own *Traité d'instrumentation* Kastner reported that the scherzo of Berlioz's *Roméo et Juliette* required col legno playing, although no such indication is found in the score.[12]

Harmonics are produced by touching the strings at points of division of their length with the fingers of the left hand but without sufficient pressure to bring them into contact with the fingerboard, as they are in normal playing. They have a special quality of softness and mystery, and the extremely high pitch of some of them extends the upper range of the violin immensely. There are natural and artificial harmonics, the former produced by lightly touching the open strings at certain points. These harmonics speak more reliably, with a better sound on all four strings. In Ex. 18a–d the black notes show the actual pitch of the harmonics, while the white notes show the positions to be touched on the open strings.

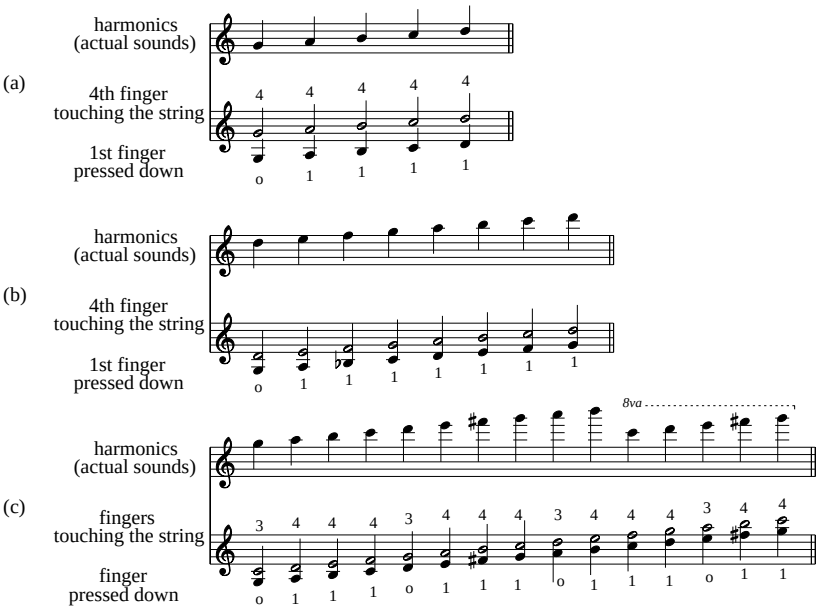
Ex. 18



[12] F-Pn Rés. F. 1369.

Artificial harmonics can sound clearly over the whole range by pressing the first finger firmly on the string, providing a movable nut, while the other fingers touch it lightly. Touching an octave higher gives its unison, a fingering scarcely ever used except on the *g* string because it is so awkward (Ex. 19a). Touching a fifth higher gives its octave, easier than the previous one but harder than the next (Ex. 19b). Touching a fourth higher gives its twelfth (Ex. 19c).

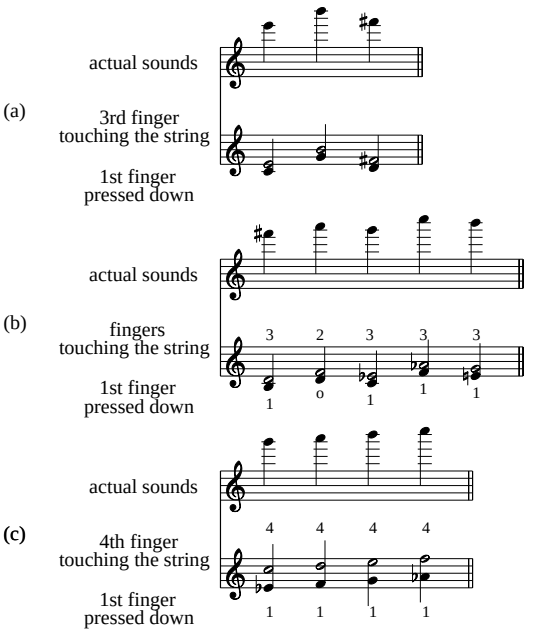
Ex. 19



This last fingering is the easiest of these, and the best for orchestral purposes except for a note a twelfth above an open string, when the fingering with a fifth (Ex. 19b) is preferable. Thus, to produce *b‴* it is better to touch *b″* on the open *e″* string, giving a note an octave higher with greater sonority, than to use a string on which the first finger has to be pressed down, for example fingering *b′* on the *a′* string and touching *e″*, giving the same note *b‴* as before.

Touching the string a major third or minor third higher is very rarely used, the harmonics this produces being much less good. Touching a major third gives a note two octaves higher, pressing with the first finger and touching with the third (Ex. 20a). Touching a minor third higher gives a note a major seventeenth higher (Ex. 20b). Touching a major sixth higher gives a twelfth higher (Ex. 20c). Although this is less often used than the fourth (Ex. 19c), it is quite good and often useful.

Ex. 20



I must repeat that touching the fourth and fifth higher (Exx. 19c and 19b) are much the most highly recommended.

Some virtuosi can play double-stopped harmonics, but this effect is so difficult and so risky that composers would be well advised not to write it.

Harmonics on the *g* string sound rather like a flute, an idea worth using for slow, singing melodies. Paganini used them with extraordinary success in the *Prière* from Rossini's *Moïse*. On the other strings harmonics are purer and thinner the higher up you go. This characteristic, as well as their crystalline timbre, makes them suitable for what I call 'fairy' chords. These are chordal effects which draw the listener into ecstatic dreams and carry the mind away to the imaginary delights of a poetic, make-believe world. Although they are familiar to young violinists today, they should not be used at a quick tempo, or at least one should avoid writing a series of rapid notes, to be certain of their being played correctly.

Berlioz's table gives a comprehensive list of obtainable natural harmonics, but he does not mention that most of them were regarded as the province of virtuosi only and belong more to the realm of theory than of practice. Paganini's playing had revealed an uncharted world of harmonics. These were tabulated by Guhr (whom Berlioz lampooned in his *Memoirs*) in his *Ueber Paganinis Kunst, die Violine zu spielen* (Mainz, 1829), which was translated into French and may have been known to Berlioz. Mazas's *Méthode de violon* (Paris, 1830) and Baillot's *L'art du violon* (1834) also discuss harmonics at length. Of the fifty-one natural harmonics listed here Berlioz himself used only two: the two-octave harmonic obtained by

placing the finger lightly on the string a fourth higher than the pitch of the open string, which he used on the a' and e'' strings only. For viola and cello harmonics, see below, pp. 34 and 47.

Ex. 19a shows octave stretches for unison harmonics, but 'awkward' is a gross understatement. This fingering is in effect impossible except by hands of superhuman size. The g/g' natural harmonic is commonly used, but the artificial harmonics are virtually unknown. Baillot's treatise shows the octave harmonic on $a\flat$ but more for theoretical completeness than as a practical suggestion; Guhr merely described it as 'difficult, on account of the great extension of the little finger; it becomes easier by holding the fundamental note with the side of the first joint of the forefinger, by which means the little finger can reach the middle of the string'. In practice Berlioz required exclusively the two-octave harmonics shown in Ex. 19c. He wrote them in three works: *Roméo et Juliette* (*Reine Mab* scherzo) (*NBE* 18: 203–7), *Au cimetière* (*NBE* 13: 70–1) and Act V of *Les Troyens* (*NBE* 2b: 639–43). He used only the upper part of the range, from f' (sounding f''') up to g'' (sounding g''''). To call the harmonics shown in Ex. 20c 'quite good and often useful' is an exaggeration. The stretch of a sixth from first to fourth fingers is for very large hands only, and the harmonic does not speak easily. Berlioz never found any use for it himself, nor did Guhr or Baillot list it.

Double-stopped harmonics were one of Paganini's many innovations. The Introduction and Variations on 'Dal tuo stellato soglio' from Rossini's *Moïse* was composed in 1818–19 but not published until 1855. Paganini played the piece frequently, although Berlioz appears never to have heard him play. It is notated in C minor, but sounds in E♭ minor with the g string tuned up to $b\flat$.

The composer may write harmonics in two, three, or even four parts, according to the number of violin parts he has. Sustained chords of this kind have a truly remarkable effect if they match the subject of the piece and accord with the rest of the orchestration. The first time I wrote them was in the scherzo of a symphony, with three parts sustained over a fourth violin part (not playing harmonics) which trills throughout on the lowest note of the chord. The extreme delicacy of the harmonics in this passage is intensified by the use of mutes. Dampened in this way they sound in the remotest regions of the audible scale, an effect almost unobtainable with ordinary fingering.

When writing chords of harmonics like this, one must be sure, in my view, to use notes of different shape and size placed one above the other to show the note where the finger touches the string and the note of its actual sound. This applies to harmonics made with an open string. With a stopped string one must also indicate the note where the finger stops the string, so that as many as three signs may have to be used for a single sounding note. Without this precision in the notation the performance could become a confused jumble in which the composer would scarcely recognise his own work.

Berlioz always notates violin harmonics with the precision he advocates, using three pitches for every note (or two when an open string is used): the finger to be

pressed (or open string), the finger touching the string lightly, and the resultant pitch.

In the *Treatise* he excerpted bars 354–88 of the *Reine Mab* scherzo (*NBE* 18: 203–5) in full score at the point where he referred to 'the scherzo of a symphony'. Kastner used the same passage from *Roméo et Juliette* as an illustration in the Supplément to his *Cours d'instrumentation*, published in 1844 shortly after Berlioz's *Traité*. There he remarks: 'We believe that still better results could be obtained from giving harmonics to the whole string section, including the double basses; we communicated our ideas on this subject to several composers, including MM. Meyerbeer and Berlioz, long before the composition of *Roméo et Juliette*.' When Berlioz says he used harmonics for the first time in *Roméo et Juliette* he is referring to harmonics on the violin; he had written harmonics for the cello in the *Huit scènes de Faust* (see p. 48).

In the *Rgm* Berlioz described it as 'annoying that the profound study of harmonics is not undertaken at the Conservatoire'. In his *Memoirs* he again complained that the subject of harmonics was not taught at the Paris Conservatoire: 'The little that our young violinists have learnt about it they have acquired for themselves since Paganini's appearance.'[13]

Mutes are small wooden devices to be placed on the bridge of stringed instruments in order to weaken the sound, giving at the same time a sad, mysterious and soft character to the instrument. They can be appropriate in any kind of music. Mutes are used principally in slow pieces, but they can be equally effective in light, rapid figures, if it suits the subject of the piece, or in accompaniments with urgent pulse. Gluck demonstrated this in his sublime monologue in the Italian version of *Alceste*, 'Chi mi parla'.

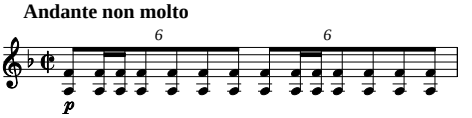
Normally, when mutes are used, the whole string section is muted, yet there are occasions – less rare than one might suppose – when a single section muted (the first violins, for example) will have a special effect on the whole orchestral colour by mixing clear with veiled sound. There are other occasions when the character of the melody is so different from that of its accompaniment that the distinction can be highlighted by the use of mutes. If a composer calls for mutes in the middle of a piece (to be indicated by the words 'con sordini') he must not forget to give the players time to take them off and put them on. He should leave the violins a gap of two bars in common time at moderate tempo or its equivalent. A shorter gap is sufficient for the indication 'senza sordini' for taking them off since that change can be done much more quickly. The sudden switch from this dampened sound of a violin section to the clear, open unmuted sound is sometimes astonishing in its effect.

Without referring to it in his text, Berlioz here inserted the first twenty-eight bars of the *Reine Mab* scherzo (*NBE* 18: 182–3) in full score as an illustration of the use of mutes in 'light, rapid figures' before printing the extract fom the Italian version of *Alceste*, with the repeated rhythm of Ex. 21 in the strings. He discussed the Gluck

[13] *Memoirs*, 'Travels in Germany', II/5.

passage in two articles in 1861;[14] he had already regretted its omission from the French version of the opera in an article in the *Gazette musicale* on 8 June 1834.

Ex. 21



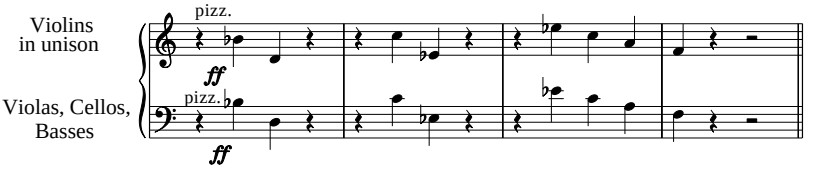
A good example of the first violins being muted while the rest of the strings remain unmuted is found in Chorèbe's air 'Mais le ciel et la terre' in *Les Troyens* Act I (*NBE* 2a: 68). Conversely, first violins remain unmuted in *La damnation de Faust* Part I Scene 1 while seconds, violas and cellos are muted (*NBE* 8a: 9). On this occasion, since the seconds and violas have too few rests in which to put on mutes, Berlioz directs them to do it in stages over five bars.

Pizzicato (plucking) is also a widely used device for bowed instruments. The sound produced by plucked strings is much loved by singers for accompaniments since it never covers the voice. It is very effective also in symphonic music, even in energetic orchestral passages, either in all the strings or in just one or two sections.

The slow movement of Beethoven's Fourth Symphony provides a delightful example of pizzicato on second violins, violas, cellos and basses while the first violins play with the bow. In this passage (bars 26–34) the two contrasting sonorities blend in a truly marvellous manner with the clarinet's melodic sighs, and greatly enhance its expression.

Pizzicatos played *forte* should in general not be written too high or too low on the instrument, the very high notes being thin and dry, the low ones being too dull. Against a vigorous wind passage, therefore, you would get a very good pizzicato effect by giving all the strings a figure such as Ex. 22.

Ex. 22



Plucked chords of two, three or four notes are also useful in *fortissimo*. This is done by crossing the strings so rapidly with the one finger violinists always use that they seem to be struck all at once and to vibrate almost simultaneously. Soft accompanying figures, pizzicato, are always graceful in effect; they relax the listener and if not overused provide some variety in orchestral texture. Violinists do not regard pizzicato as an integral part of violin technique and have therefore scarcely studied it at all. At present they have only developed the technique of using the thumb and forefinger, so they cannot manage runs or arpeggios faster than semiquavers

[14] *Jd*, 26 March and 23 November 1861.