MANUAL OF ORCHESTRATION

HAMILTON CLARKE

A

MANUAL OF ORCHESTRATION:

DESIGNED ESPECIALLY TO ENABLE AMATEURS TO FOLLOW INTELLIGENTLY THE PERFORMANCE OF ORCHESTRAL MUSIC.

BY

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With an Appendix containing details as to the structure, compass, and peculiarities of the various instruments of the orchestra, by

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TO MY OLD FRIEND,

CYRIL WILLIAM BOWDLER BELL

(*Colonel in the 8th Royal Irish Hussars*),

AN ADMIRABLE MUSICIAN AND ELEGANT COMPOSER,

I Dedicate this Manual,

AS A SMALL TOKEN OF GRATITUDE FOR MANY YEARS OF

SYMPATHY, ADVICE, AND CONSOLATION,

IN MY ARTISTIC LIFE.

CONTENTS.

A MANUAL OF ORCHESTRATION.

INTRODUCTION.

"ORCHESTRATION" is a word which is now in the mouth of every boy and girl who is taken to hear a concert or an opera.

It is a coined and most unsatisfactory word; so is its companion "instrumentation." But modern usage is much addicted to coining words, especially when a long word saves the trouble of saying several short ones. "Orchestration" is shorter than "scoring for the orchestra," and "instrumentation" than "arranging for the different instruments."

It is only in quite latter times that the word "orchestration" has been so much heard amongst the talk of the people; this is probably attributable to the advent amongst us of certain operas of the modern German school, wherein the use of the orchestra is the chief and only point of interest in the performance. For, whereas, throughout an entire evening's entertainment we have failed to discern a single fragment of melody or "tune," it is not unreasonable to suppose that the average listener would be struck, for lack of something beautiful, by the volcanic discharges of the brass instruments, the thunderclaps from numerous drums, the weird eccentricities, the tortuous and interminable twistings

of outrageous contrapuntal extravagances gone through by the stringed instruments, to say nothing of the porpoise-like gambols indulged in by some of the solo wind instruments. These sole points of interest and excitement in the opera being to the least enlightened hearer accomplished by the orchestra, some pedant would be sure to be at hand with the word "orchestration" pat upon his tongue, whereupon the "least enlightened hearer" leaves the theatre armed with a new musical fact for the edification of his friends, and hugging to himself the sincere belief that his discovery of the "magnificent instrumentation" contained in this opera is a distinct addition to his musical education!

This is the only manner in which I can account for the flippant and constant use of this harsh, cumbrous word; and the more it is heard, the more must a devout musician become convinced that they who prattle of "orchestration" know about as much of the delicate, graceful, and entrancing study of the *art of writing for the orchestra*, as an acrobat knows of the rules of "falling bodies."

Indeed, to ordinary persons who attend concerts, operas, and oratorios either from fashion, habit, or whim, an orchestra is merely a platform filled with musicians paid to sit there, and make a pleasant noise. To the musician, the same view represents an army with which he could conquer ten thousand spheres, a vision of a realm wherein abide all the forces of beauty, inspiration, imagination, and devotion; an atmosphere which his soul can navigate on the wings of eternal, experimental, and rapturous fancy; a sphere of thought such as transcends the compass of the wildest and most glorious dreams of the greatest poet that ever dwelt on earth!

But, although it must be my purpose to reveal to the student who may read this little essay—so far as may be within my poor means—the spiritual and sacred

nature of the stupendous privilege he enjoys in being permitted to explore the same divine region of fancy from which Mozart, Beethoven, Mendelssohn, and others of inspired genius, have brought to us such inestimable treasures, it still behoves me to remember that my advice, to be useful, must be practical, and as brief as possible.

To all such as might imagine that by reading and mastering the contents of this small volume, they will be enabled to write brilliantly for the orchestra, and to score overtures, marches, and waltzes in such a manner as will cause vast audiences to rave in delight about their "magnificent orchestration," I say "Close my book; I do not think it will suit you."

To such as are content to walk reverently with me in a beautiful garden, wherein bloom all manner of sweet and magical flowers of infinite variety of form, and radiant in the hues of ten thousand rainbows, and who will in earnest trustfulness try to learn from me the little that I know as to how a few of these beautiful growths may be cultivated in a garden of their own, I say "Come with me, and I will gladly show you some of the exquisite mysteries that I have learned from the Great Gardener and his pupils."

CHAPTER I.

A FIRST GENERAL GLANCE AT THE ORCHESTRA.

It may be, that in the following pages, I may consider it wise to make use of frequent comparisons, designed to render more clear such observations as may appear to be important, between *sound*, as received by the *ear;* and *colour*, as discerned by the *eye*.

It is obviously beyond all dispute that the element of variety, as between sounds, and different qualities of sounds, obtainable by the combination of different instruments, enjoys a marked and easily traceable analogy to the variety, as between colours and different qualities of colours, obtainable by a judicious and masterly combination of the different pigments in the colour-box of an artist who paints pictures. But we will recur to this theory when advisable.

The word "orchestra" has a very elastic significance, according to circumstances. It is by usage applied to a band of five performers quite as justly as to a body of instrumentalists whose stringed instruments alone are numbered by hundreds. A church organ with three stops and one manual is in itself just as much an "organ" as is an instrument with a hundred stops and four manuals.

The fact of this one word being the only available one for indicating respective masses of performers, varying in number from five persons to five hundred, or, for the matter of that, five thousand, has been the cause of a lamentable want of perception. Thus, persons are led away in hundreds and thousands by the effect of banging, clashing, thunderous displays of what may be called "brute force," and made to believe that it is "fine instrumentation." They pass by entirely unheeded, delicate, pathetic strains, given forth by a few artistically combined instruments, because there is nothing to strike or startle the unthinking, uncultured mind. The respective producers of such effects as these, suggest to my mind one horticulturist who ransacks half-a-dozen hot-houses in order to produce a floral device, which, when seen, is a display of garish, oppressive vulgarity; and another who exhibits a design almost heavenly in its grace and simplicity, and this realised by the use of a handful of violets, snowdrops, and a few green leaves. Here is a first illustration of the analogy between *tone* and *colour*.

As an instance of this pitiable lack of discrimination, I will recall an experience which befell me at a choral competition in a huge building, crowded with people assembled to hear the contending bodies give evidence of their powers. A small body of beautifully-trained male voices sang the chorus, "Thou comest here to the land, O friend," from Mendelssohn's *Œdipus* music, and rendered it with absolute perfection; the exquisite orchestral accompaniment being played equally well. This delicious work was received by the vast audience in dull, insulting silence. A provincial rabble of some eight hundred then invaded the platform, and bellowed forth some barbarous national song, commencing with the orchestra in B flat, but drowning the band, and rising well up to C natural before it was finished, and at the

conclusion the applause placed the roof, walls, and flooring of the enormous edifice in imminent peril.

Before commencing to speak of either the different instruments in the orchestra, or of the infinite and still undiscovered modes of combining them, it will be necessary to point out to the student the conditions he must have fulfilled before he may venture to approach orchestral territory with a view to making use of its resources in the illustration of his own ideas of composition.

As an artist must master the secrets of geometry, form, perspective, proportion, and all other matters appertaining to perfect *line-drawing*, before attempting to deal with *colour*, so must the musician make himself a complete expert in all the forms of correct writing, before he attempts to embellish his productions with the magic beauty of instrumental colouring. Learn to build a house before trying to ornament its walls. I will here make a remark which might seem premature, but for its forming an excellent rule to keep before one's mind from the very outset. When you begin to score your own compositions beware of one very perilous snare, which is sure to beset you. *Never trust to orchestration as a means to hide defects in form.* Your composition should be perfect in itself, and be able to pass the strictest examination, before you seek to invest it with the charms of orchestral picturesqueness. (I would not have the student to understand that an advanced composer is compelled to perfect his composition before he begins to score it; on the contrary, there are some composers so gifted that they will *compose their work in score;* but the same necessity for observing correctness of form, proportion, rhythm, &c., will apply to their work, *as they proceed with it.*)

First.—It is necessary to be thoroughly acquainted—always by the aid of a competent teacher—with sufficient

of the rules of harmony, chords, and so on, as will enable you to write freely and elegantly in four parts. I say *four* parts because the string quartet form is absolutely the highest type of part-writing. In your study of harmony, you may frequently compose exercises in five, six, or eight parts, in order to acquire facility in correct writing, especially for voices. As to the more advanced study of *counterpoint and fugue*, the necessity depends upon the style of composition you aspire to follow. For the ordinary orchestral composition of merit however high, all the study of the school-book part of music that will be found absolutely essential, will be so much as shall enable you to write correctly, and with facility, in four parts, generally speaking.

Secondly.—I will point out the means by which you can render this part of your study as pleasant as it will be improving. If you have a tolerable voice, get permission to join some choral class, church choir, or amateur vocal society, where the choral works of the great masters, their masses, and the anthems and services of the old and modern church composers are practised. In an Anglican Church, where full cathedral service is sung, you will hear and take part in anthems and services, and in a Roman Catholic Church you will make the delightful acquaintance of the beautiful masses of Haydn, Mozart, and others.

Thirdly.—A second method, very strongly to be recommended as either a substitute for, or a companion to, the course of study above set forth, will be to learn—of course, under proper tuition—the violin or violoncello. When you have arrived at a standard of efficiency, by no means difficult of attainment, your violin or violoncello playing will enable you to take a part in performing the works of Corelli; and later in the trios, quartets, quintets, and other "chamber-music" of the great

masters. This study of a stringed instrument will furnish you later with a passport into regions still more fascinating, to be enlarged upon in due course.

FOURTHLY.—A still further medium, through which to make yourself proficient in clear and musicianly part-writing, and which you can pursue at the same time with the two forms of study already described, consists in practising the *organ*. In order to be a sound musician and composer, it is by no means necessary that you should become a magnificent performer on any instrument. It is only requisite that you should play a stringed instrument well enough to render yourself above objection in the company of performers more or less advanced than yourself. And as to your organ-playing, as your object is improvement of your mind, and not display of your skill, the profit and benefit of study will keep pace with your devout and serious examination of, and attempt to play, the noble and varied compositions already written for this instrument.

When you play a stringed instrument fairly well, lose no time in joining some orchestra. There are very few towns of any importance where there is not some society in which they practise orchestral music. In your earlier times it would be well if you could obtain access to some body of amateurs who practise the oratorios of Handel; in his works you will find a musical nourishment which will give bone and sinew to your artistic constitution, and make your mind sound and healthy as a mountain pine-tree. Later, it will be advisable to seek the companionship of such as perform the symphonies, and other orchestral works of the great masters; these will give elasticity to the hardy muscles you already owe to Handel.

As you progress, you will find it desirable to cultivate the personal acquaintance of other instruments. This you will discover to be a source of constant and ever-

increasing pleasure. For, although in the course of a three months' flirtation with any instrument, it is scarcely to be supposed that you will win its total obedience, still, you will learn sufficient of its nature and character to enable you to know how to treat it when writing for it. For instance, if you get a good horn-player to give you a few lessons in the method of blowing the instrument, and you practise steadily for *three months*, you will know better how to write effectively for it than *some of the great composers did.*

No one can over-rate the advantage of being an orchestral *player* to him who seeks to be an orchestral *composer*. A looker-on sees most of the battle, but he does not know what it is to be a *soldier*. And who can so keenly apprehend the great heart of the orchestra, as he who has felt himself to be one of the particles of the *blood* that has set that great heart *throbbing?* No one has ever yet realised the true majesty of the orchestra, who has not played in it, and felt the glory of being one of the billows swelling upon the bosom of that sublime ocean of sound.

The design of this little volume is not to assist the pedant or the tyro in discovering a royal road to the display of arrogant self-sufficiency; it is dedicated alone and exclusively to such fellow-workers as wish to devote their best and most faithful energies to the work of rendering themselves worthy to write for the orchestra. And to these I say, that although the course of study thus embarked upon is tedious, and often painfully mechanical, there are rewards awaiting the devout student when he shall have attained the possession of some of its magic secrets, such as the combined munificence of a continent's crowned heads would fail to rival. There is no known language capable of conveying the sensations realised by one who, for the first time, hears a worthy performance of one of his own compositions for the

orchestra. If it happens that his work be for *voices* and *organ*, in addition to the *orchestra*, and the scene of the performance be a cathedral, it will be difficult for him to believe that the occasion belongs to this earth!

CHAPTER II.

PROPORTIONS OF THE ORCHESTRA.

Before examining the various instruments found in a modern full orchestra, it will be as well to enumerate them, appending a few general remarks when necessary.

As was said in the first chapter, the significance of the word "orchestra" is elastic; this fact will be practically realised by anyone who, after reading these pages, should at some future time find himself the conductor of an opera-tour through the provinces, in the United States, or elsewhere. For, whereas, the opera in question will probably be scored for the following instruments:—

2 Flutes	1 Oboe
2 Clarinets	1 Bassoon
2 Horns	2 Cornets
1 Trombone (or 2)	Drums, and
Complete Strings	

there are very few provincial towns where the principal theatre possesses a band in which all these instruments will be found; indeed, there are very few theatres in London that have them all.

In the provinces, the instruments most rare are the *oboe*, *bassoon*, and *horns*. I do not suppose there are ten provincial theatre bands which can boast of a pair of *horns;* while in many instances there are to be found only one *clarinet*, one *cornet*, and very seldom either *oboe*

or *bassoon*. The *trombone* is very frequently supplanted by the *euphonium*, and sometimes even the *strings* are not complete. I know of one theatre band which comprises only the following instruments :—

1 Flute	1 Clarinet
1 Cornet	1 Euphonium
1 1st Violin	1 2nd Violin
1 Double Bass	

If we consider for a moment the *places* in the scale of sound of these seven instruments, we shall discern at a glance that with the exception of the feeble scraping of the 2nd violin, the resources of this musical company are confined to the *treble* and *bass*, there being none to supply the *inner parts*. And yet a motley assemblage like this (and all the performers of the most fifth-rate quality !), will undertake the accompaniment of an opera, including the performance of the overture, with all the confidence of the band of the Royal Italian Opera ! While upon this part of our subject, it may not be out of place to explain the only two ways of ameliorating this state of things, and of ensuring the most efficient rendering of an opera under such circumstances. The first, and more expensive plan (and by consequence a very rare luxury for a conductor to enjoy), is to engage seven or eight, or even more, competent performers to travel with the company, and so be available on all occasions as a tower of strength.* The other remedy, which entails the most heart-breaking exertions on the conductor, is to have a *pianoforte* before him in the orchestra, and to fill up the harmonies with his *left* hand, while beating time with his *right*, and to lay down his bâton and play with *both hands*, whenever it is safe to do so. Some prefer a *harmonium*, the tone of which is more like the quality of some of the wind instruments whose parts the conductor endeavours to

* I believe I am correct in stating that Mr. Carl Rosa never travels with less than at least *fifteen musicians*.

reproduce; but this is a mistake, because the *calibre* of the harmonium is weak and feeble, whereas the mere percussion of the pianoforte serves to keep the rest of the performers together. But some conductors can play neither the pianoforte nor harmonium, and in such a case the result need not be described!

In many theatrical (so-called) orchestras, the number of instruments *en evidence* will be perhaps nine or ten; while, in too many instances, those *audible* will amount to about *three*—the *piccolo*, *cornet*, and *side-drum*. But, as all human undertakings are governed by the extent of the resources at hand, it is obvious that ten or a dozen different bands such as are commonly heard would have to join themselves together in order to furnish the numbers necessary to represent what is really implied in the term "*full orchestra*." Let us then see of what such a body of performers consists. We will suppose that we are now talking of a first-rate *concert orchestra*, such as would worthily render the symphonies of Beethoven, Mendelssohn, and some of the modern composers. We should require

2 Flutes 2 Oboes
2 Clarinets 2 Bassoons
4 Horns (sometimes 2 are sufficient)
2 Trumpets (now almost entirely superseded by *cornets*)
3 Trombones
Timpani (kettle-drums)
1st Violins (number not limited)
2nd Violins ,, ,, ,,
Violas ,, ,, ,,
Violoncellos ,, ,, ,,
Double Basses ,, ,, ,,

Of the two *flutes*, the second performer is expected to play the *piccolo*-part, if there be one; in certain cases there is a piccolo-part written in addition to the two flute-parts.

By *horns*, it is scarcely necessary to mention that *French horns* are meant, with or without valves.

The *timpani*, or kettle-drums, are generally two in number, and are tuned mostly to the tonic and dominant of the key in which the orchestra is playing, as will be seen further on. *Three* are *occasionally* used.

With a *wind-band* of the above dimensions, the number of *stringed instruments* suitable to balance it in fair proportion is very difficult to determine. According to circumstances, the 1*st violins* might vary from six to twenty, or even more. But, as a vast number of stringed instruments, or, indeed, any unusually large orchestra is, as a rule, brought together only for special occasions, it is a very allowable plan, in order to balance the tone of the band as far as may be, to double, or even quadruple, the wind instruments.* Yet, like all monster exhibitions, the performance of a huge orchestra can never possibly possess any further charm than the mere giving forth of a large sound, heard at its best as an accompaniment to a chorus numbered by thousands. A delicate movement from some symphony, played by an orchestra of five hundred performers, would be like the contents of a nursery garden spread over the side of a mountain.

To return to the proportions of a reasonable and effective orchestra, the stringed instruments should bear some such relation in number as the following :—

(1)		(2)		(3)
12 1st Violins	*or*	18 1st Violins	*or*	24 1st Violins
8 2nd Violins		12 2nd Violins		16 2nd Violins
6 Violas		8 Violas		12 Violas
6 Violoncellos		8 Violoncellos		12 Violoncellos
6 Double Basses		8 Double Basses		12 Double Basses

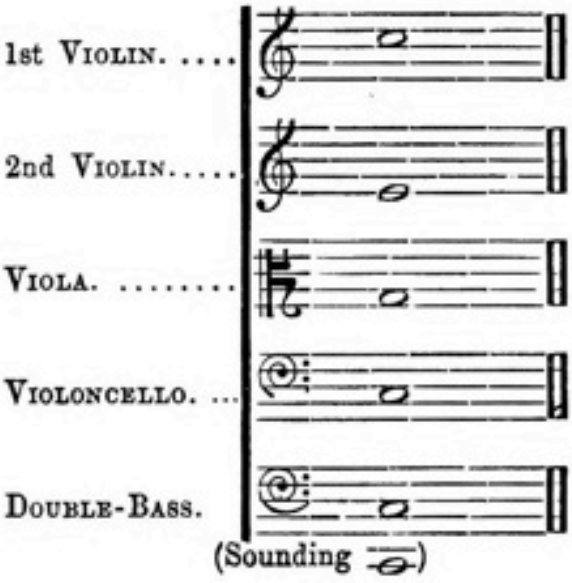
* Thus, at the Handel Festival, where the orchestra numbers more than *five hundred performers*, the wind instruments of each kind, in order to be heard amongst the multitude of strings, are grouped in *dozens* and *sixteens*.

It is by no means absolutely necessary to preserve this exact proportion between the numbers of performers. For instance, in the first group, ten 2nd violins would not be too many, and five violoncellos and double basses might be sufficient. A safe rule is, that the 1*st violins* should slightly exceed the number of the 2*nd violins*, the *violas* somewhat fewer than the 2*nd violins*, the *violoncellos* about half the number of the 1*st violins*, and the same number of *double basses*.

A significant fact with regard to the *violoncellos* and *double basses* must here be mentioned. It is a great mistake to suppose that the double bass, being a larger instrument than the violoncello, produces a larger tone; the exact contrary is the case. The *natural bass* of the four-part quartet, played by the violoncello, is, in reality, a much louder note than the one played by the double bass below. (I do not altogether express what I mean by the word "*louder;*" *firmer*, *more solid*, is perhaps more to the purpose.)

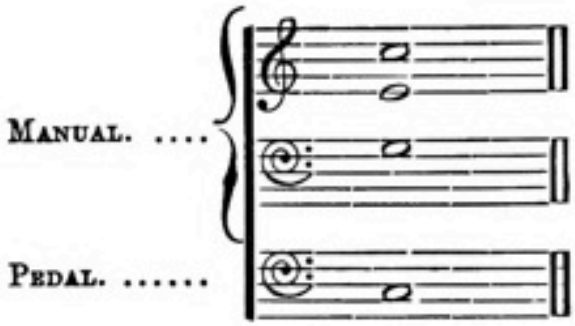
To illustrate this, take the following chord:—

Ex. 1.

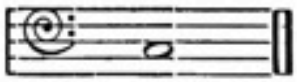


I call the C on the violoncello the "natural bass" of the chord, because it is the lowest of the *four parts:* the C below, on the double bass, is simply the *octave below the bass note.* Suppose a similar chord on the organ,

Ex. 2.



and say that the performer plays the two top notes with his right hand, the middle G with his left, and the C with his foot; if, as in ordinary use, the *manual* be coupled to the *pedal*, *diapason stops* being used on the former, and a suitable 16-foot stop on the latter, it will be found that the low C on the manual, and the octave below on the pedal, will stand relative to each other in calibre, precisely the same as do the C on the violoncello, and the octave below on the double bass. That is to say that the real or "*natural*" bass will be found in the



with a gentler tone in the 16-foot note underneath it.

Therefore, in case of an orchestra where the violoncellos and double basses are not equal in number (especially if the orchestra be comparatively small), the effect will be far the more satisfactory if there are rather more double basses than violoncellos, because the tone of the latter is more solid and piercing than that of the former.

CHAPTER III.

PROPORTIONS OF THE ORCHESTRA.—II.

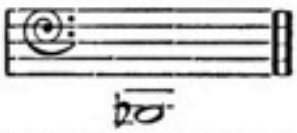
A FULL orchestra of fair dimensions, if designed to play modern music, must contain, in addition to the timpani, a bass drum and cymbals, and side drum and triangle.

There are also other instruments whose services are demanded in the exigences of certain schools of modern music. Wagner makes free use of them, and Berlioz, in his cumbrous and extravagant scores, writes for certain strange instruments in the most pantomimic fashion. Amongst these may be mentioned the

Bass Clarinet
Tenor Clarinet
Contra Fagotta, or Double Bass Bassoon
Corno Inglese
Corno di Bassetto, or Bassett Horn
Ophecleide
Various kinds of Horns
Euphonium
Bombardon, or Tuba
Serpent—(and others; the names and peculiarities of which will be found duly set forth in "Hector Berlioz on the orchestra")

The *Bass Clarinet* is a somewhat clumsy instrument, sounding an octave below the ordinary clarinet; a good clarinet-player can soon acquire the mastery of this instrument. The *tenor clarinet* is something between the treble and bass clarinet, but is very seldom used.

The *Contra Fagotto*, or *Double-bass Bassoon* is an unwieldy and laborious instrument, but of very dignified effect, both in orchestral and military music, if written for with the utmost caution and judgment. Specimens vary as to their compass, but about a seventh below the



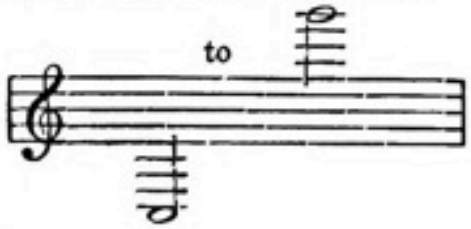
of the ordinary bassoon is supposed to be the limit—that is to say the octave below the

of the violoncello.

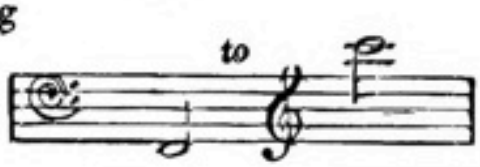
The *Corno Inglese*, *English horn*, or *Cor Anglais*, as it is variously termed, is a kind of tenor oboe, easily acquired by capable oboe-players.

The *Corno di Bassetto*, or *Bassett Horn*, is somewhat similar to an alto or tenor clarinet, and like the bass clarinet, it has a brass or silver bell, turning up like the bowl of a Turkish pipe, instead of the plain wooden bell of the ordinary clarinet.

Its compass may be said to extend from



sounding



Its lowest notes are the best. Mozart uses the Bassett Horn in his requiem, and also in his opera, "Clemenza di Tito." It is now so rarely used, that it can scarcely be classed amongst ordinary orchestral instruments.

The *Ophecleide* is now nearly obsolete, and supplanted by the *Euphonium*, *Bombardon*, or *Tuba*. The Ophecleide was, however, made free use of by Mendelssohn, notably in his music to the "Midsummer's-night Dream." In these days, this part has to be played on one of the modern instruments above-named.

Of the various *horns*, much will be said hereafter.

The *Serpent* is now practically obsolete, as there are few, if any, living who can play it. Its total disappearance from military bands took place more than twenty years ago; and from the orchestra, probably long before that, except on such special occasions as the earlier Handel Festivals, where several were planted among the male chorus to support the voices.

There are certain other varieties of wind instruments used in military bands, more especially on the continent. Amongst these are the

Saxophone—a sort of coarse clarinet made of brass (varying in size and pitch), played by clarinet-players with a clarinet mouthpiece; a very fine sonorous instrument in the inner parts of a military band; and the

Sarosophone—a deep bass brass instrument, played with a bassoon-reed. The tone of this instrument is best described as suggesting a *wind-double-bass*.

I have here mentioned something of the character of these rather uncommon instruments, and conceive that nothing further need be said of them, as their peculiarities are never likely to come under the eye of him who writes for the orchestra in these days. All the essential instruments will receive due attention in future chapters.

It is a peculiar fact that some of the most charming and artistic of orchestral compositions are designed for a *very small orchestra.* The symphonies of Mozart are remarkable for the absence from the score respectively and in groups, of *flutes*, *oboes*, *bassoons*, *clarinets*, *trumpets*, and *trombones*, as the case may be. The first movement of Beethoven's exquisite "Pastoral Symphony" contains neither *trumpets*, *trombones*, nor *drums.* In Mendelssohn's divinely romantic overture to "Melusina," the only brass instruments used are two *trumpets* and two *horns.* Numerous similar cases might be quoted, but the student can hereafter investigate these things for himself.

But, referring once more to the *elastic* character of the term "orchestra," there are some facts bearing upon this part of our subject which are of vast importance to the aspirant to orchestral composition. To score a *symphony* for a band of sixty performers is a very different kind of work from scoring a *light opera*, which will be performed in theatres where the very largest band you can possibly hope for will probably be something under thirty.

A very satisfactory, and as times go, a very fine band for an ordinary theatre, would be found in the following list:—

2 Flutes (second playing the Piccolo when required)

1 Oboe	2 Clarinets
1 Bassoon (two very rare)	2 Horns
2 Cornets	1 Trombone (or two)

Percussion (Timpani, Bass Drum, Cymbals, Side Drum, and Triangle, sometimes all undertaken by one performer)

6 1st Violins	4 2nd Violins
2 Violas	2 Violoncellos
2 Double Basses	

Here we have *twenty-eight performers*, whereas very few theatres can accommodate more than *twenty* at the

very most. So, we will suppose a comic opera is scored for the wind instruments above indicated, and you have to perform it with a band numbering twenty in all; you have to make shift as you best can, and do it as effectively as possible with the instruments you have. We will suppose the twenty performers distributed thus:—

1 Flute (changing to Piccolo when necessary)
1 Oboe
2 Clarinets
1 Bassoon
2 Horns
2 Cornets
1 Trombone
Percussion
3 1st Violins
2 2nd Violins
1 Viola
1 Violoncello
2 Double Basses

Now, it must be clear to the mind of any musician that instead of being a *full orchestra*, this is a mere *substitute* for one. In a dramatic theatre, however, a body of musicians such as this would be accounted a magnificent band.* And I do not hesitate to pronounce it *far too magnificent*, for in a dramatic theatre, the highest ambition of the conductor is fettered by the fact that the best *entr'acte* music serves no higher purpose than to promote and stimulate *conversation amongst the audience.* And the more aristocratic the theatre, the louder and more general the talking.

* I was once going to conduct a rehearsal of an opera which was to be played for a week at a certain provincial town. Conversing previously with the manager, I asked him what sort of a band he had. "Splendid," was the reply, "you will be delighted with my band." "How many have you?" I asked. "Well," answered he, "in general I have *seven*, but for you I've engaged *two more!*"

When listening to a work performed by a fine concert orchestra, we cannot fail to realise that the main body of tone dwells in the *stringed instruments.* The strings in an orchestra occupy precisely the same position as do the diapason stops in an organ. The *strings* are the *substance* of the *orchestra*, as the *diapasons* are of the *organ.* They are the walls and pillars of the temple, the *wind instruments* are the decorations of the walls and pillars. Whole pages of a score may be confined to passages played by the strings alone, because in them you have a profound bulk of sonority, together with an enormous range of notes. The salient test of a composer is the manner in which he writes for the *strings.* There are popular composers at the present moment riding in carriages obtained out of the profits on their compositions, whose treatment of the *string quartet* of the orchestra would be a disgrace to their *copyists.*

And now suppose we are listening to a *small orchestra* of from twenty to thirty, such as is described above; we find that the strings, by reason of the poverty of their number, have lost all the fine, substantial *sonority* that they had in the *large orchestra.* It is therefore obvious that a totally different method must be observed in scoring for a theatre band, as opposed to a concert orchestra. To be brief, it is in this case necessary to utilise to a far greater extent the *wind instruments*, especially those of *wood*, in order to strengthen the *strings*, which are not powerful enough to be heard much alone. Thus, you may make free use of the *flute*, either in unison, or in octaves, with the 1*st violins;* the *oboe* also, if you have one; in dance-music especially, the 1*st clarinet* is used largely in unison with the 1*st violins;* and even, occasionally, the 1*st cornet* is permitted this familiarity with his superiors. The *trombone* and *bassoon* may also devote much of their energies to the support of the *violoncello* and *double-bass.*

A skilful master of orchestral writing will score his music for a band of this size in a manner at once fresh, graceful, and fascinating. It is not, however, a vision of the "*orchestra*" in its real sense. But there is such a thing as an "*orchestra di camera;*" that is, a band suitable for hearing in a *drawing-room.* I have heard music exquisitely scored for a band consisting of the following:—

1 Flute (and Piccolo)
1 Oboe
2 Clarinets
1 Bassoon
2 Horns
Pair of light kettle-drums, and Strings

amounting in all to, say, *fourteen performers.* I have myself had to score operatic music for a band constituted thus:—

1 Flute (and Piccolo)
2 Clarinets
2 Cornets
1 Trombone
Drums, and
Strings

thirteen in all—and I found it a most interesting study. In the first, you will find a singular absence of the *strident* brass instruments; while in the second, the delicate *reed* instruments give way to the *brass.* Of the two bands, I infinitely prefer the former; but in what was done in both cases there was an illustration of the fact, that it is not the *number of instruments* used, that constitutes fine writing for the orchestra, but the *manner in which you use those you have.* An artist will tell us that it is not the number of colours we use that makes our painting fine, but the manner in which we combine the few.

I have mentioned these things with a view to induce the student to believe that writing for the orchestra is a matter of extreme delicacy and refinement. It is a mixture of poetry, romance, imagination, and above all other feelings, of reverence. Certain persons have written books upon writing for the orchestra, as if it were a matter just on a level with carpentering or cabinet-maker's work. These books have produced composers who work like carpenters and cabinet-makers. Let us take a somewhat higher view of our beautiful art!

CHAPTER IV.

THE STRINGED INSTRUMENTS.

We must now commence the examination of the various instruments in the orchestra, beginning with the *violin*, as being the head of the *string family*, which, as we have before heard, forms the *foundation*, the *bulk*, the *substance*, of the orchestral structure.

The violin is, in many respects, the most perfect *solo instrument* in the world. Perhaps the reason why it is, generally speaking, the *worst played* of all known instruments, lies in the fact that there are so few *perfect musicians* to play upon it.

The absolute intrinsic value of the violin as a solo instrument, however, varies according to circumstances. A violin solo in a large hall, if performed by the very finest player on a superb instrument, is a mere display of dexterity. The musical result of the performance is contemptible. In a small room, the fact of display remains, while the musical features of the performance are a trifle more bearable. It is impossible that the smallest amount of real pleasure can be derived from the ordinary class of violin solos; those listeners who are themselves violin players experience a sort of pleasure in watching their friend go through his indescribable antics, knowing how difficult they are; but to the general public, the only

sensation that can be felt must be that the gentleman, by his gestures, must be doing something very difficult and praiseworthy: hence they burst, at the conclusion of the piece, into irresponsible applause. Not but that there are solos for the violin which are masterly compositions. *Mendelssohn's concerto in E minor*, which, to my mind, is not so much a *violin concerto* as a *short symphony with violin obbligato*, contains the maximum of melodic and elegant writing, with the minimum of clap-trap and vulgarisms, and the orchestral part is simply delicious from beginning to end.

As a solo instrument, in a *string quartet*, the violin is heard at its best; a quartet being obviously a *solo for four instruments*. If the room be not too large, and the performers competent, a string quartet is an exhibition of the highest form of musical intellectuality. To their quartets for two violins, viola, and violoncello, Beethoven, Haydn, and Mozart have devoted the very selected treasures of their genius.

The violin is also heard to extreme advantage in *sonata* combination with the *pianoforte*. This is, granting always that the violin in question is a fine instrument, and in the hands of a performer who can at once elicit the riches of its tone and play *in tune*. An inferior violin, played upon by a half-educated performer, is an instrument of torture; and the slip-shod, half-hearted fiddling one hears in many of our public orchestras, is a disgrace to our country. Out of every dozen violin players, in the ordinary ranks of the musical profession, six do not know how to hold their bows, while ten are absolutely ignorant of the rudiments of phrasing.

The *violin* as an *orchestral instrument* is the glory of the musical world. A mass of good violin players—say any number from a dozen upwards—possesses the means of giving out a quality of tone absolutely superior to any other known sound. The tone of the united first violins

can be as shrill as an alarm whistle; as gentle as the voice of a dove; as quiet as a sigh; as rich as an autumn sunset; as wooing as the whisper of the softest female voice; as fierce as the roar of a hurricane. In melodic passages, the tone is of a purity surpassing anything in this world; in joyous passages, it is full of exuberant life, and the most ravishing gaiety; in stormy passages, it is menacing as the crash of huge breakers on a rock-bound shore; and in pathetic passages, its tender, sorrowful wail is beyond all description.

These remarks apply in an equal degree to the *viola* and the *violoncello*. As to the viola, as a melodic instrument it presents, as compared to the violin, a singular compromise. By its nature, it is destitute of much of the brilliancy and gaiety of the violin—I am now speaking exclusively of masses of instruments as you see them assembled in an orchestra—but if one comes across a melodic passage, judiciously and tenderly written for the violas, there is a certain refined, veiled beauty perceptible, which belongs exclusively to this instrument.

As to the *violoncellos*, it is difficult to estimate justly their superlative qualities. As I before remarked, they are the *natural bass* of the orchestra, supported, or supplemented, underneath by the 16-foot tone of the double basses. This is the *duty* of the violoncellos; but at proper times, and under judicious management, the violoncellos are found to be capable of vastly more beautiful offices than the mere duty of supplying a bass to the orchestra. The combined violoncellos, if playing a melody in some movement, of a character at the same time romantic and serious, are found to possess a quality of tone richer and more significant than either the violins or violas.

As an instance, and the very finest that I can call to mind, of the supreme qualities of the strings as melodic instruments in combination (that is to say, in a body), I would point to that most transcendently beautiful concep-

tion, the andante in Mendelssohn's "Scotch Symphony." Here, for some ten minutes, the atmosphere breathed by one who has the good fortune to listen to a worthy rendering of this andante, is almost oppressive with the rich and entrancing burden of divine melody that takes possession of his senses and his soul. No words of mine can convey a faithful description of it.

In writing for the stringed instruments, the rules which should govern the student are chiefly supplied by the peculiar difficulties of fingering them. Nothing short of a careful and complete study of the way in which every scale upon each of these instruments is played, can furnish a safe guide to him who would compose for them suitable music. But this is by no means the gigantic task that it appears at a first glance. While allowing to a composer all fair play in the matter of imagination and fancy, the fairest guide is *reason;* and if, after gaining a tolerably accurate knowledge of the way in which instruments are *played*, you avoid *writing* passages which, if played, *sound ridiculous*, the probability is that you will steer clear of writing *unplayable* passages.

CHAPTER V.

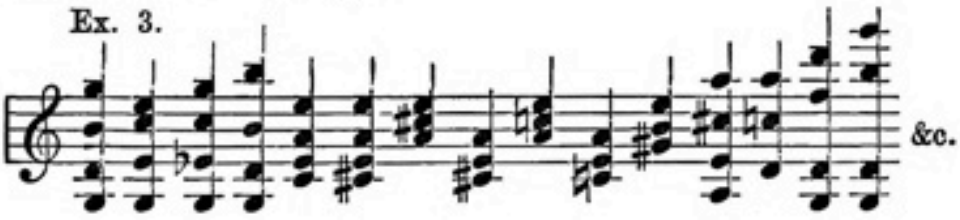
STRINGED INSTRUMENTS.

[CONTINUED.]

ONE of the points upon which most caution is necessary, from a purely mechanical view, is the question of writing *chords* or *double stops* for the stringed instruments; for, whereas certain chords of three or even four notes are easy and effective, a chord composed of *two* notes only may be extremely awkward, or impossible. The rule to be observed is this: if the lowest note of the chord be on the *fourth* string, the next note must be on the *third* or *next* string to it, and so with the other notes. You cannot play on the *fourth* and *second* strings *together*, because it would be impossible to prevent sounding the *one between*. Further, the convenience of the player in the disposal of his fingers must be rigidly cared for.

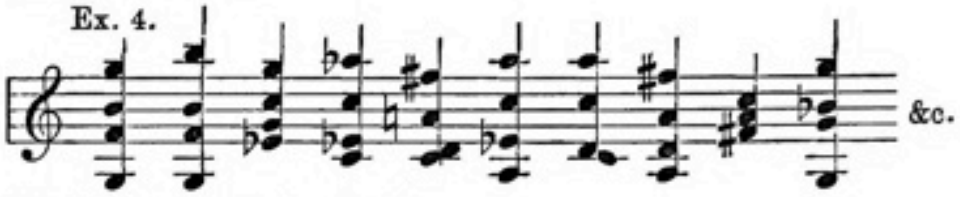
These chords are easy :—

Ex. 3.



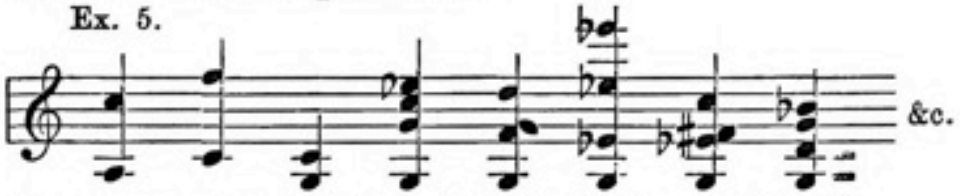
These are difficult:—

Ex. 4.



While these are impossible:—

Ex. 5.



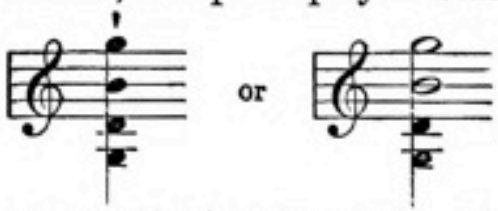
The reason why this is so shall be briefly explained.

In Ex. 3, all the notes lie so that they are conveniently *under the fingers*, and involve no awkward contortion of the hand.

In Ex. 4, the fingers (if the chords be tried upon a violin), will be found so cramped in getting hold of some of the notes, that the performer will require a certain number of seconds of time in order to *arrange* his fingers on the strings; and in some cases, one short finger will have to reach over inconveniently beyond a long one—the proper order of the fingers being, as a rule, the *first* finger to the *fourth* string, the *second* to the *third*, and so on.

In Ex. 5, the impossibility of playing the chords arises partly from the *enormous stretch* of the fingers, and partly from the fact that, as in chord No. 4, while the two G's and the C are easily playable, there is no string upon which the E♭ can be sounded.

It must be observed that all chords of more than *two notes* are unavailable, except as played with a dash, thus:

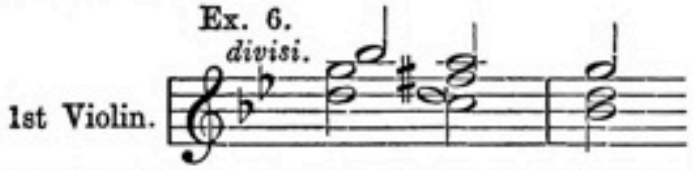


tho two top notes continuing to sound. This is because

by the construction of the fingerboard, it is impossible to draw the bow over more than two strings at a time.

If you desire to have *chords* on the strings which cannot be played by any *single instrument* of the particular part, it is customary to divide them, and indicate this by the word *divisi*, thus :—

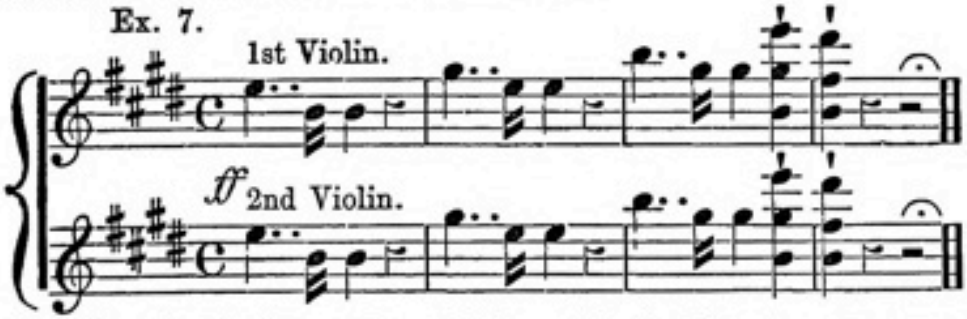
Ex. 6.



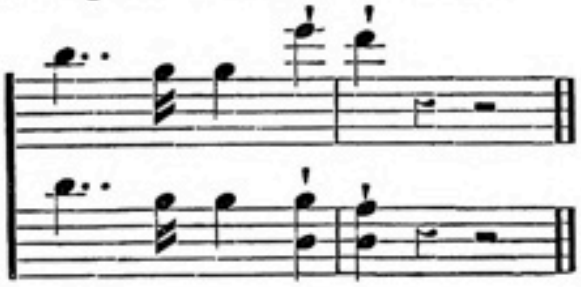
A further illustration of this arrangement will be given later.

The simplest method of writing for the stringed instruments is always the best, and the *fewer* notes you write (except, of course, for special effects), the *better* they will be *played*. Beethoven is astoundingly reckless occasionally; in his overture to *Fidelio*, he writes thus for the 1st and 2nd violins at the commencement :—

Ex. 7.



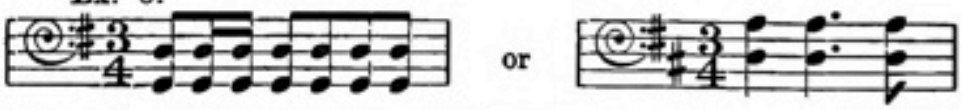
The chords of *three notes* at the end of this phrase are a peculiarly injudicious arrangement, and abortive in the effect when performed; it is a matter of mechanical fact that a far safer and more satisfactory result would be gained by writing the last two bars thus :—



and the grounds upon which I excuse my assurance in interfering with Beethoven are simply these: in stretching their three fingers over the strings to catch these three notes, the violinists not only run a narrow risk of not getting them perfectly in tune, but, by setting three strings in vibration at once, they only get the same degree of sonority out of the three that they would out of one, thus producing three *weak* notes instead of one *strong* one. The 2nd violins, following the same example, contribute their contingent of weak notes, whereas, if the 1st violins confined themselves to the upper notes, they would get a fine, round tone; and the 2nd violins, if playing the two lower notes, would fill up the harmony with a tone quite strong enough to balance the sonority of the single notes played by the 1st violins.

In writing for the violoncellos in the orchestra, it is almost unvaryingly injudicious to write double notes. Occasionally, for special effects, it is allowable to write fifths, especially in music of a pastoral character, but very rarely any other interval, not even octaves. In rare instances, fifths are found effective, thus:—

Ex. 8.



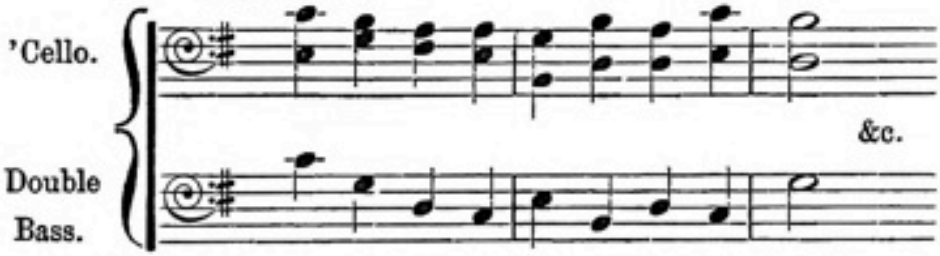
They should almost invariably occur on the *open* strings. Sometimes, in solemn passages, when the double basses are silent, a fine effect is produced, according to the combination of other instruments, by holding the two lowest notes thus:—

Ex. 9.

I would desire to impress upon the student the absolute necessity of regarding the string portion of the orchestra as a *quartet*, and not as a *quintet*, although there are *five* kinds

of instruments. The habit with some persons of treating the strings as a *quintet*, leads them into the utmost extravagances and incongruities. They divide the violoncellos from the double basses, and sometimes set up three-part harmony between the two. In cases such as this, they lose entirely the proper quality of the bass, namely, the 8-*foot unison*, and the 16-*foot octave*. Neither is anything gained; what addition may be actually acquired as to the number of notes in the harmony, is rendered useless by the unsatisfactory grunting occasioned by fifths and sixths in the lower part of the chords, thus:—

Ex. 10.



There is a most pernicious habit brought into fashion by certain half-educated composers, notably those of the third-rate French comic opera school, recently so popular in this country. This is, the manner of constantly employing the violoncello in *counter-melody*. Instead of devoting itself to the sober and dignified work of preserving a good solid bass for the whole orchestra to stand upon, some young composers make this superb and most obedient servant dance up and down amongst the harmonies, wasting its strength in all manner of frivolous littlenesses, designed to display the composer's talent, but, in the result, only revealing his puny imagination.

Should it become necessary to employ the violoncello on any other work than that of keeping up the foundation, care should always be taken to fill up the gap which will be created in the best part of the bass, by the temporary removal of the 8-foot toned instrument. There are two ways of doing this. In many cases, the double-bass part may be written up so high as almost to take the 8-foot

tone part into its own care; but if the character of the movement be such that a deep bass is requisite at the same time that the violoncello is employed in melody or *arpeggio* as the case may be, the 8-foot part must be supplied either by one of the *bassoons* or a *trombone* playing very gently. With this rule before him, the student will discern with the utmost ease, as the occasion presents itself, which will be the more judicious instrument to use.

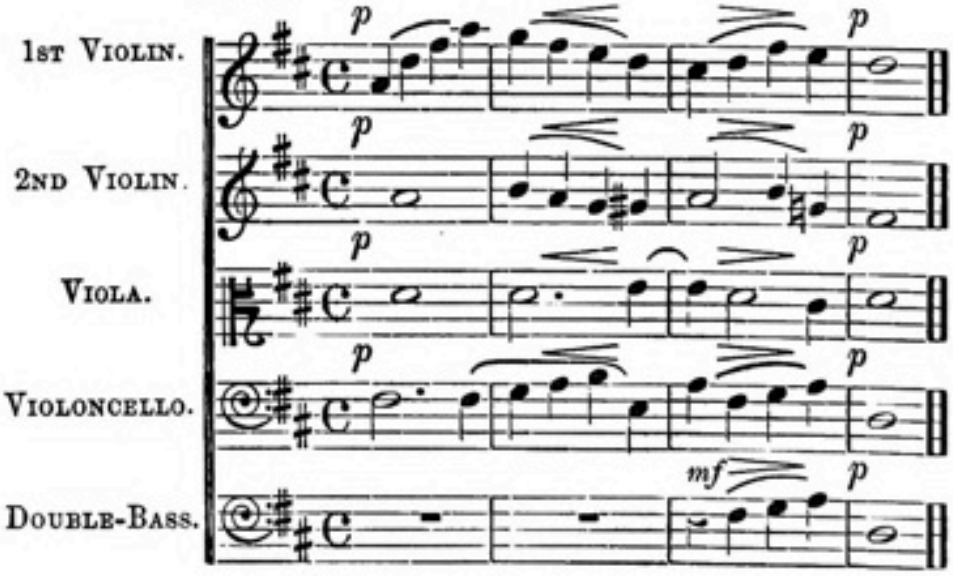
This question of the due relation between 8-foot and 16-foot tone is at the root of much that constitutes excellent orchestral writing, and the judicious combination of the two forms a most important element in organ music, as well as in music for the orchestra.

Knowing when *effectively* to leave out the 16-foot tone, and let the *pure four-part* harmonies be heard, constitutes one of the greatest niceties of composition; that is to say, to discern when it will be judicious to give the *pedals a rest* in regard to organ music, and the double basses in regard to the orchestra.

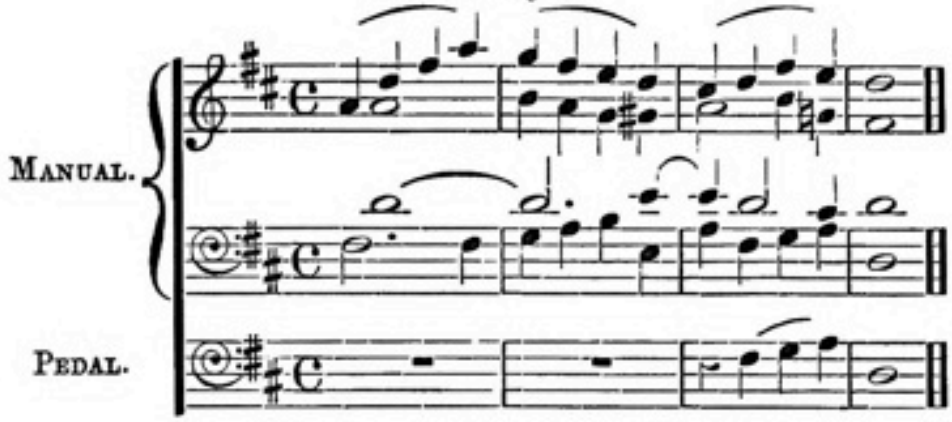
Here is an instance:—

For the strings in the orchestra.

Ex. 11.



For the organ.



My meaning here will be clearly discerned, through the actual identity between the *double bass part* and the *pedal part* of this fragment, treated both as a passage for *strings* and for the *organ*.

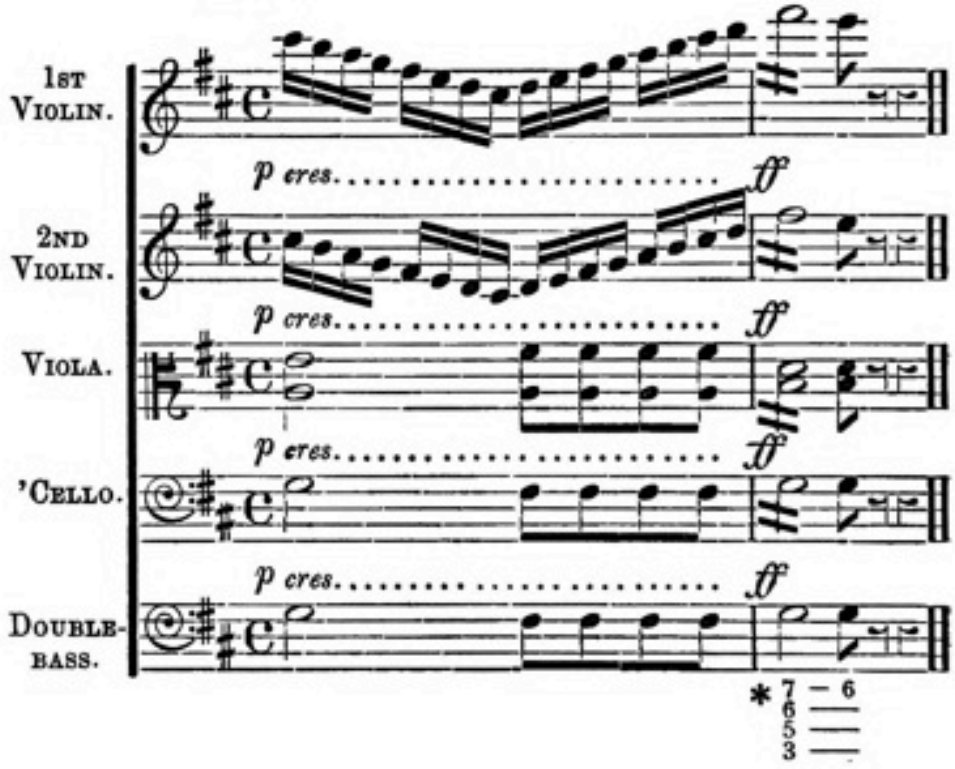
An examination from time to time of the scores of good orchestral works, will reveal to the student vast fields of example, and funds of encouragement, when he observes the really simple means by which great composers realise their most beautiful effects.

The method of treating the stringed instruments is infinitely varied. If you require them to announce a phrase alone, they are capable of the most emphatic and dignified utterance; whereas, if you wish the whole strings of the orchestra to act simply as an *accompaniment* to a faint wailing cry of one *oboe*, *clarinet*, or *bassoon*, they will subdue themselves into the expression of the tenderest sob, *scarcely audible*, but *felt* in every fibre of the frame of the intelligent listener. The strings are almost a mighty orchestra in themselves alone, and yet the great and powerful host of vibrating *cords* will reduce itself into something like the flutter of a tiny bird's wing.

On examining the best orchestral scores, it will be seen that amongst various methods of utilising the melodic qualities of the violins, it is permitted frequently to write

them in octaves, the 2nd violins being an octave below the first. In rapid *allegro* passages, this plan is also often adopted with very fine effect; but when both the 1*st* and 2*nd violins* are employed in melodic work, whether *cantabile* or *agitato*, it is obvious that the violas alone are scarcely strong enough to supply the inner harmonies; therefore the student must be careful to employ, in a judicious manner, certain other instruments. Here is a case:—

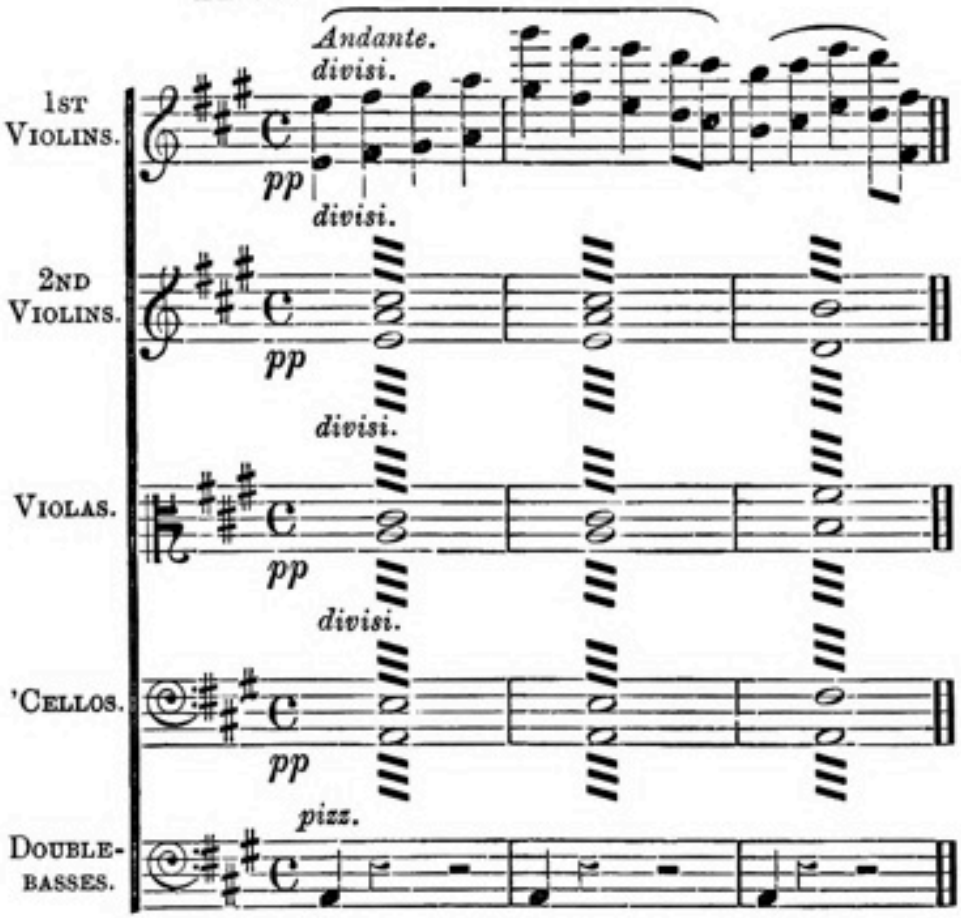
Ex. 12.



and it will be clear that the harmonies *must* be filled up by other instruments, as there are essential notes in the chord at the sign * which are not heard on the strings at all.

Another mode of using the violins is to divide them; that is, to write two or more parts for each. If written on the same line, you signify it by the word *divisi* thus (as before remarked):

Ex. 13.



This is sometimes extremely effective, especially when played with *mutes*, indicated as *con sordini*.

As to the use of the *pizzicato*, or plucking the strings with the finger instead of bowing, there is no special rule. It must be regulated by the judgment of the composer, and actuated by the greatest caution, and reserved for peculiar effects. A single *pizzicato* note, delivered *pp* on the basses, will often make you *start* at the weird, menacing, mysterious effect it produces.

CHAPTER VI.

THE WOOD-WIND.

In endeavouring to present a few of my experiences with regard to the nature and character of the various orchestral instruments, I must make it clear to the student that, within the compass of this little volume, I shall be able to do but little more than *introduce* them to him; the *acquaintance* must be carried on by himself. Also, I assume that he is already familiar with the form and structure of every instrument; likewise, more or less, with its *compass*. I must assume further, that in consideration of the boundless wealth of orchestral treasures at his disposal in the way of scores of the best works, which are now procurable for a very trifling charge, he will regard it as his privilege and duty to study them constantly and devoutly. In treating of the various instruments therefore, and their combinations, I shall illustrate their effective employment *a liberâ manu*, as it may occur to me, because, if I were to commence quotations from the great composers, I should never know when to stop.

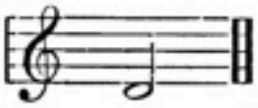
The Flute (and Piccolo).

As the youngest member of the flute family, and the very *top-tone* of the orchestra, we will commence with the *piccolo*.

The value of this, the smallest of all musical instruments, is determined entirely by good judgment in its use.

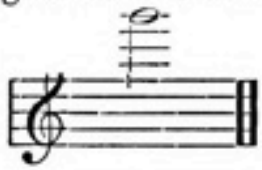
By reason of its extremely high pitch, it forms the topmost point of the highest pinnacle in the whole orchestral structure. Sounded alone, it is so shrill and harsh as to be perfectly unbearable; while, when properly used, and associated with the *flute*, it will play good notes several semi-tones higher than can judiciously be written for the 1*st violins*. The music for the piccolo is written the same as for the *flute*, but *sounds an octave higher;* thus piccolo and flute, written for in unison, but sounding in octaves, are very effective, especially in loud passages.

The compass of the piccolo is from the low D :—



to the high C:—

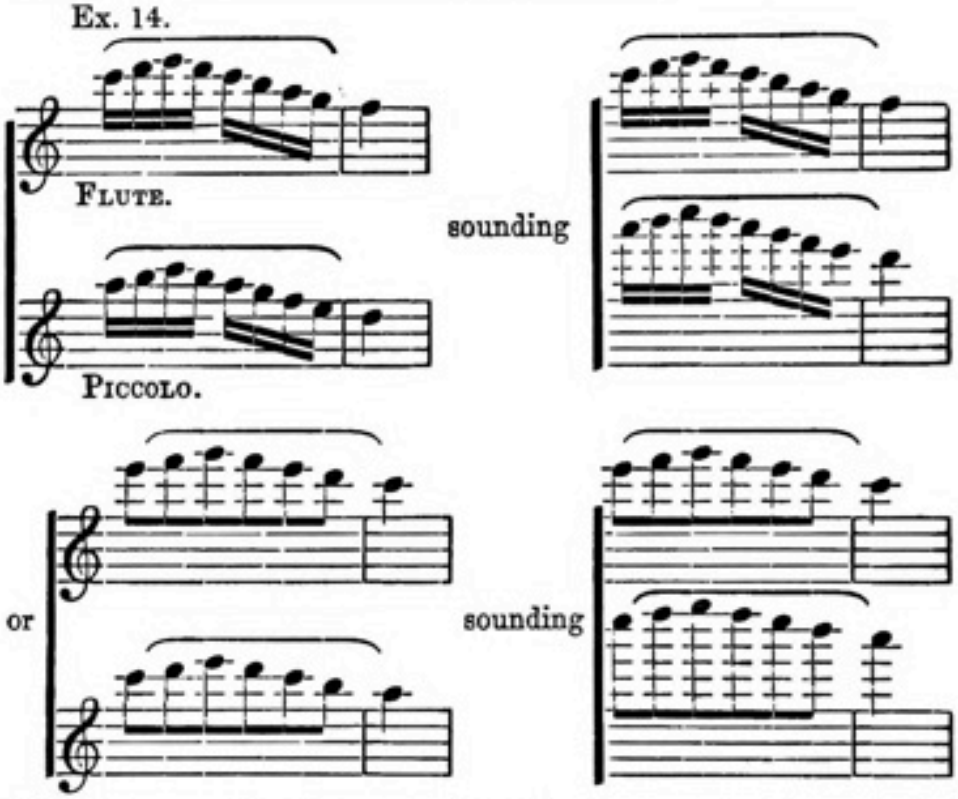
all sounding an octave higher than written. It is unwise, however, to write higher than G :—



the five semi-tones between that and the highest C being not only extremely harsh, but difficult to sound, by reason of the immense force with which the breath has to be sent into the instrument.

In light music, especially dance movements, the piccolo is found very effective if used in unison with the 1st violins (sounding, of course, an octave higher), whether its companion, the flute, be playing or not. For a certain effect, a melody may be given to the *flute and piccolo*, sounding in octaves, and passages in *thirds*, or *sixths*, are very often most brilliant, thus :—

Ex. 14.



This is expressly the case when the upper notes you desire to use are too high for the 1st flute to play.

The *flute*, being the next highest of the wind instruments, having available some six or seven good notes higher than can be attempted by the *oboe* or *clarinet*, is a very important and effective instrument.*

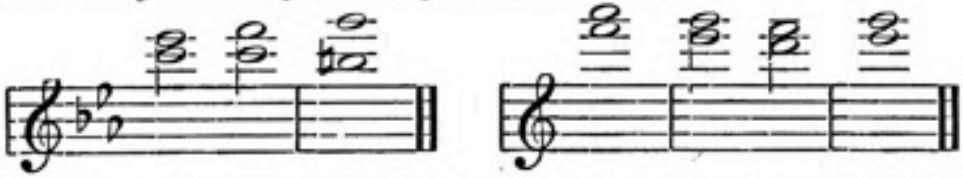
When merely required to fill up, or utilize itself by adding to the tone of the orchestra in loud passages, it can be written in unison with the 1st violins, or at times an octave above them; while in soft, *cantabile* parts, an *octave above* the 1st violins, it sounds particularly sweet and tranquil; just adding a fine, delicate point, so to speak, to the melodic flavor of the *violins*. Playing *in unison* with them, and especially in louder passages, it sharpens the *edge* of the violin tones.

* There are flutes in various keys used in military bands and elsewhere, but it is to be understood that I confine my attention exclusively to the *concert* or *flute in C*.

Written with the *oboe*, an octave higher, the flute is intensely effective, especially in *pathetic* melodies; while in bright, gay phrases, such as occur in ballet music, the union in octaves of these two instruments produces a pleasing "twitter," like very fine bird-voices trained to music. With the *clarinet*, also, an octave higher, some remarkably effective results may be obtained, but the united tone of the *flute* and *clarinet* is not so *romantic* as that of the *flute* and *oboe*.

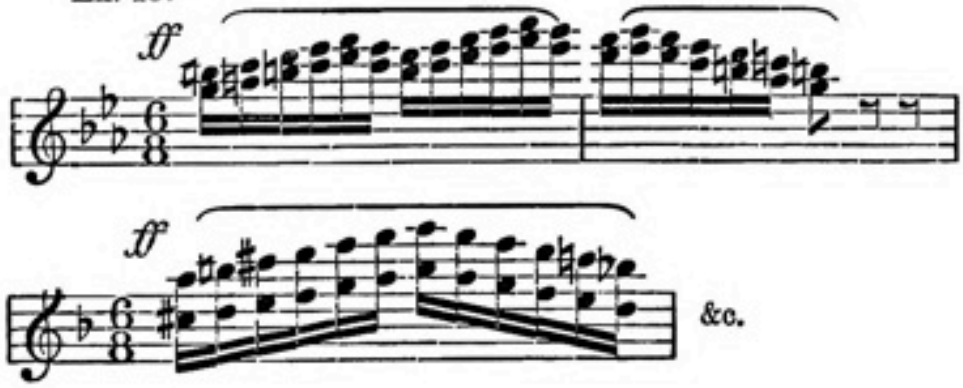
In songs and operatic pieces, it is often very judicious to introduce the flute an octave above the voice. The singer is assisted by it, and the effect is sometimes very good; but a too constant use of the same method, in any part of the orchestra, is apt to degenerate into a mannerism, and denotes lack of resource.

Taking their place as the summit of the orchestral edifice, very fine effects are attainable, especially in *chords* given to the *wind instruments* alone, by writing notes for the *two flutes very close together*, such as:—



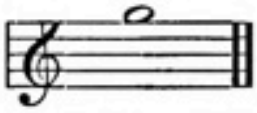
and in music of an agitated description, where stormy, sea-wavy passages are introduced, splendid effects are obtained by writing quick passages for two flutes in *thirds* or *sixths*, thus:—

Ex. 15.

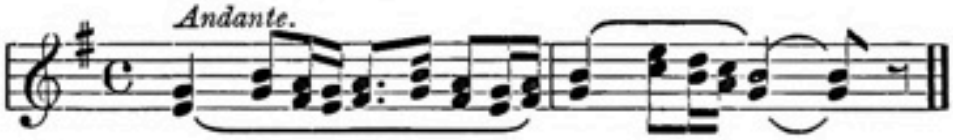


but this should rarely be done except in parts which are *fortissimo*, or certainly *forte*, because it is extremely difficult to play the high notes of the flute *piano*, and *pianissimo* is impossible.

Generally speaking, the best part of the flute for orchestral purposes, is above the lower octave, and the most effective notes, especially in loud parts, are above the G:—



but there are many very beautiful effects obtainable in *slow* and *mournful* music, by giving the two flutes such phrases as the following*:—



The flute, owing to the vast improvements in the fingering introduced within the last few years, is available in almost any key, and can play any reasonable passage. But in writing for this as for any other instrument, bear always in mind that, if you write notes which are either *ineffective* or *inaudible*, you are inflicting *unnecessary exertion* upon the performer, and causing him to waste his breath.

* A very remarkable instance of the beauty of the lower and middle registers of the flute is afforded in the andante of Mendelssohn's "Italian Symphony" (commonly called the "Pilgrim's March"), where flowing harmonies are played by the two flutes in the middle of the octave of melody.

CHAPTER VII.

THE OBOE.

The *Oboe*, with its delicate mechanism, and tiny double-reed, is the most refined of all wind instruments.

Like all other musical instruments, it is constantly subjected to the grossest abuse; the mere spectacle of a soldier marching along the street, and playing an *oboe*, in company with *trombones*, *cornets*, *side-drums*, and other engines of robust noise, is suggestive of a pigeon harnessed to a cart with horses. Moreover, in modern compositions for the orchestra, the oboe is cruelly maltreated, being frequently made to shuffle through all manner of rapid passages in unison with the violins. This is not only a waste of the delicate powers of the instrument, but it is an injustice to the performer; exacting from him the most grievous exertion, with no thanks for it. The oboe is the most *distressing* of all wind-instruments; the reason of this is that the opening in the reed through which the breath is conveyed into the pipe, is so extremely minute, that the quantity of wind received scarcely relieves the lungs at all. In other words, the amount of air required to set the instrument in vibration is so infinitesimally small, that the performer, instead of blowing into it, is almost literally holding his breath the whole time. The oboe-player consequently suffers fatigue from the fact of being

unable to get rid of his breath fast enough, while a trombone-player can go on emptying his wind-chest into his capacious tubes the whole day without becoming unpleasantly tired. For this reason, the oboe should always be written for with the greatest care.

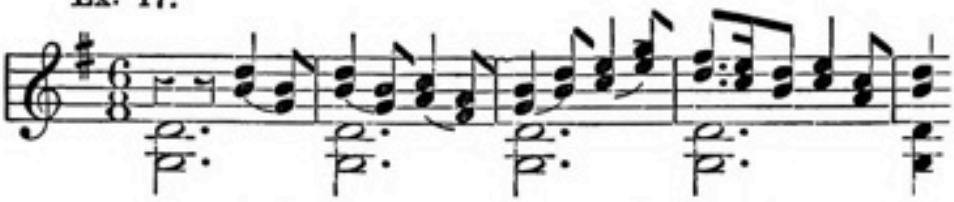
The tone of the oboe has two peculiar qualities; it is at the same time infinitely *tender* and *soft*, and astonishingly *piercing;* by the latter term, which I use in the absence of a better, I mean that its quality of sound is immensely more *penetrating* when heard with other instruments, than one would believe when listening to it alone, especially in its lower notes. For this reason, the lower notes of the oboe should be used with extreme caution when playing with other instruments, the *flutes*, *clarinets*, and *bassoons* especially, as it is apt to usurp the principal place in the harmonies to a rather disagreeable extent.

The enormous value of the oboe as a medium for the illustration of every degree and phase of pathos and tenderness has found ample acknowledgement at the hands of all the greatest composers. In the time of Handel, however, it was by no means the delicate instrument that it is in these days. Anyone who has happened to see an oboe of the old pattern, will have noticed that in the bell, or lower part of the instrument, there is a hole of the size of a large pea, bored through both sides of it. This was used for the introduction of a piece of tow, with the purpose of *deadening* or *softening* the tone.

The tone of the oboe, as the instrument we now know, is eminently qualified for the expression of melody, not necessarily sad, but in the most intense degree romantic. In pastoral effects it is heard at its best, especially when there are two, playing together. A most entrancing effect is produced at certain times by writing for two

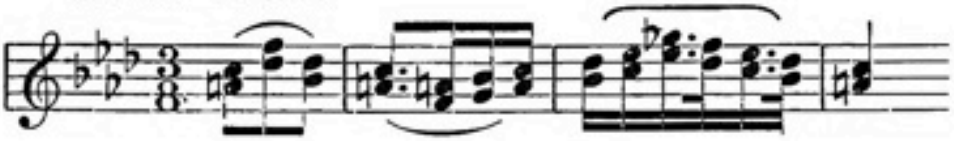
oboes in *thirds*, with some light genial accompaniment underneath; the following passage will illustrate my meaning:—

Ex. 17.



and for the delivery of sentiments in which plaintive sadness, despair, and woe are predominant, such a phrase as the following will be found an apt example:—

Ex. 18. *Andante.*



The music for the oboe is written in the same manner as that of the flute or violins, and as it is an instrument which now enjoys great facility in the matter of fingering, no serious restriction as regards keys need be enforced. It blends exquisitely in serious melody when written in octaves with the *horn*.

CHAPTER VIII.

THE CLARINET.

The *Clarinet* is by many regarded as the most beautiful of all wind-instruments, and its tone has been stated to be nearest of all in quality to the human voice. I consider this to be but faint praise, as there are very few human voices possessing a tone that is fit to be compared to the sound of a good clarinet. In the hands of a fine player, the tone of the clarinet is almost oppressive in its ineffable sweetness.

It is probable that no orchestral instrument has ever been made to do such all-round work as the clarinet. In the *orchestra* it will afford the most substantial assistance to the 1*st violins*, the 2*nd violins*, the *viola*, and even the *violoncello;* for if a melody be given to the latter instrument, the union with it of the clarinet, playing in its lower register, will enrich the effect most palpably. In a *military band*, it does the whole of the work of the violins, the clarinet being the leading melodic instrument in military music.

The clarinet is not only supreme in the conveyance of the most exquisite melodic phrases, but it is also invaluable in numerous ways when used in *accompaniment*. It is the genial companion of the *horns* and *bassoons*, and has one rare quality which is not shared in with any

other orchestral instrument; this is the furnishing, in its lower register (which is called the "*chalameau*") of a rich, warm, and eminently feeling *arpeggio*, in accompaniment; thus:—

Ex. 19. *Moderato.*

and this effect is so charming, that one is apt to employ it too frequently.

When writing for a full orchestra, the powers of this beautiful instrument should be mostly reserved for the finest effects. Although as with the entire body of instruments, it must share in the duty of filling up, especially in loud parts; due regard should be had for its inestimable quality as a melodic instrument, and as is the case with any particular instrument of which a solo-passage is expected, a reasonable period of rest should be accorded before it is called upon for an important utterance.

The *2nd Clarinet* is the most important of all the instruments in a small orchestra, a fact which I will warrant is unknown to some of the most loudly-voiced authorities on orchestral writing. The reason of this is, that when passages occur in which *thirds* are introduced; the *2nd clarinet* is pre-eminently the instrument to employ for the lower part.

In such a case as this:—

Ex. 20.

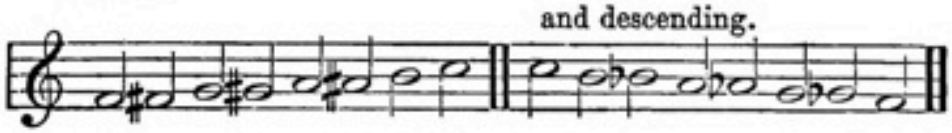
if there be no 2nd clarinet, you would either have to divide your attenuated *violins*, or give the lower part to the *flute*, the effect of which would be meagre in the extreme.

In *operatic*, or even in *sacred music*, such as oratorios, the clarinet is a magnificent instrument for furnishing an *obbligato* in soprano songs and scenas. It will blend perfectly with the finest voice; the only risk in its use for this purpose in opera being, that the notes sung by opera-singers are so frequently out of tune, that in many cases the beautiful playing of the solo-clarinet in the orchestra would be foiled and thrown away by the shortcomings of the singer on the stage.

With good playing, and a fine rich tone, it is almost impossible to imagine the clarinet obtrusive. Its sustained notes are as solid and firm as the sound of an organ diapason, whereas, in rapid passages, its articulation is as clear and distinct as the notes of a grand pianoforte.

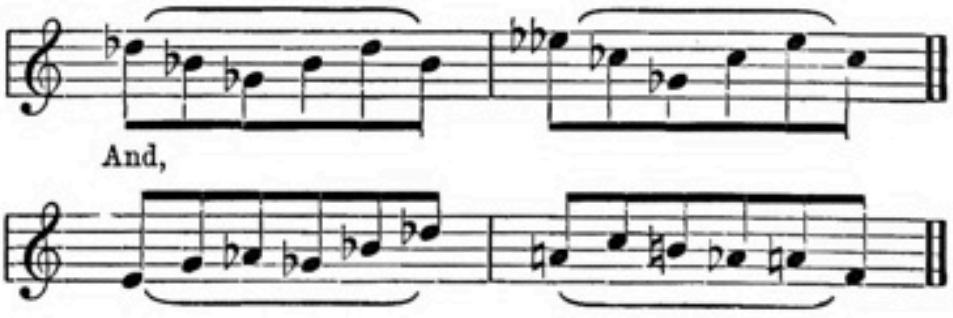
The clarinet has only one weak point, and that is in the construction of a part of its scale, difficult to finger with certainty, thus:—

Ex. 21.



Passages such as the following must be written with extreme caution:—

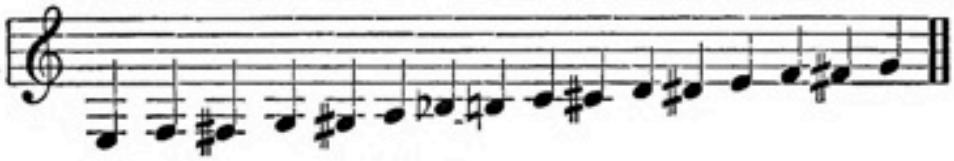
Ex. 22.



but it has been already enforced that no one can write properly for an instrument without knowing the mechanical treatment of it, and I have only to remark now, that anyone who has practised the clarinet for a week will have found out the difficulty and almost impracticability of such passages as the above.

The clarinet has *four distinct registers*, each possessing a quality of tone peculiar to itself; they are thus illustrated:—

Ex. 23. First.

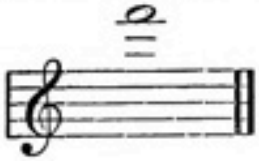


Second.

Third.

And fourth.

The higher register (the fourth), is of the least value, and the notes above F



are uncertain, and frequently harsh, except in the case of the most superior players, and should in no case be used in orchestral music.

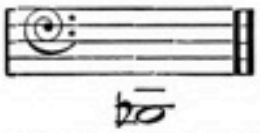
Of the three kinds of clarinets mostly in use, that is to say the *C*, *B flat*, and *A*, amongst superior players the one in *C* is very rarely used. A first-class player will often use but one clarinet (the *B flat*) throughout an entire opera or oratorio. The *E flat* clarinet is only used in *military bands.*

We shall learn more of the treatment of this instrument while speaking of the bassoon.

CHAPTER IX.

THE BASSOON AND CONTRA-FAGOTTO.

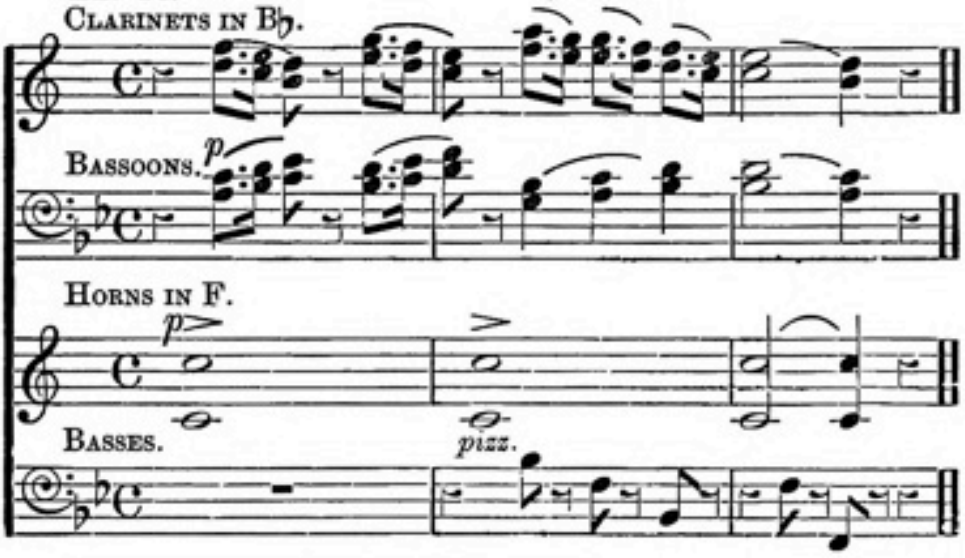
THE *bassoon* is one of the most important and dignified of all the orchestral instruments. It has a range of about *four octaves*, ascending from the lowest note, B♭.



Its resources include a capacity for utterances the most weird and plaintive, and antics the most intensely comical. A "*cadenza*," placed upon the lower octave-and-a-half of the bassoon, can be made irresistibly ludicrous.

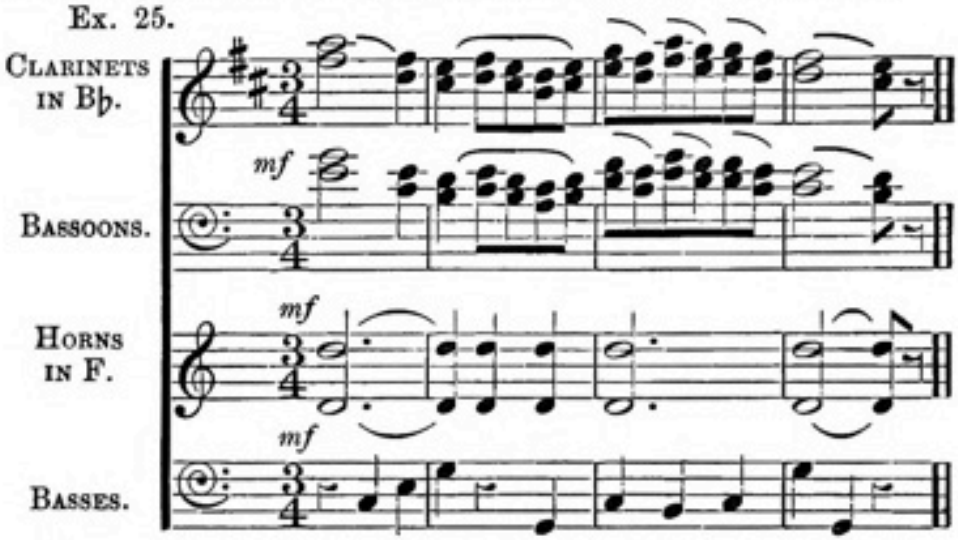
The bassoon is perhaps heard to the best effect when in company with the *clarinets* and *horns*, in such a case as the following :—

Ex. 24.



or in *octaves* with the clarinets, the horns, as in the foregoing instance, supplying sustained harmonies, as:—

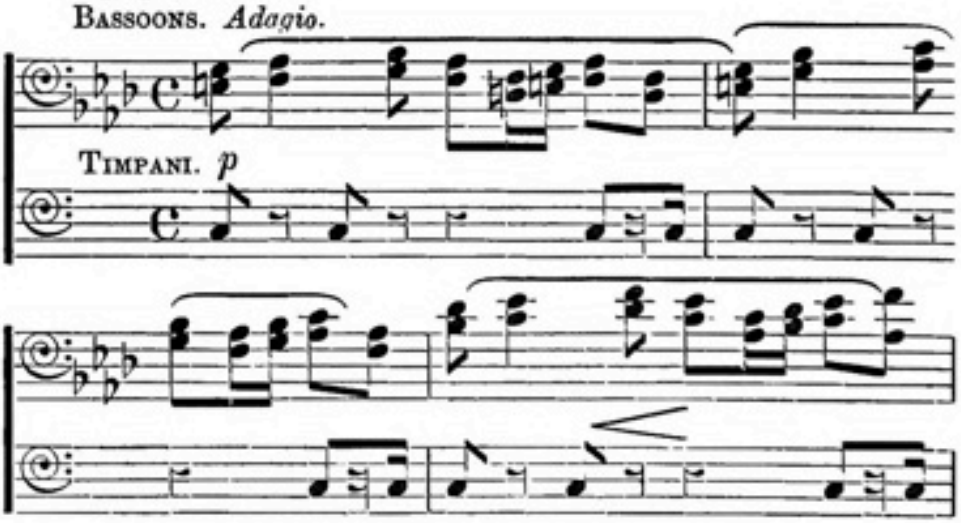
Ex. 25.



A very great charm in the quality of the bassoon is discovered when two are used with the strings, and no other instruments sounding—they add a soft warmth to the lower harmonies that cannot be realised with any other instrument.

If you are writing a *funeral march* or a *dirge*, or any very solemn movement of a mournful character, you will find a fund of wealth in the bassoons, especially if treated more or less as *solo-instruments*; the following are examples:—

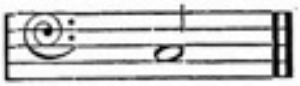
Ex. 26.



Ex. 27. *Andante.*

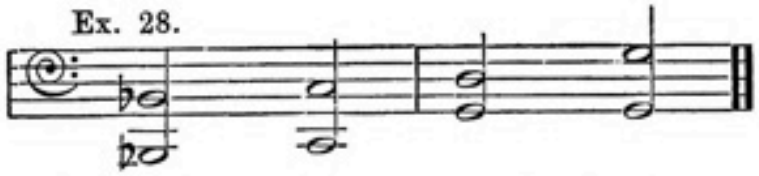
The richest of all combinations in which the bassoon takes part is, as already shown, with the *clarinets* and *horns*. One bassoon playing a melody an octave below one clarinet, has a very rich and dignified effect. It also blends well with the *oboes*, either singly or in thirds or sixths, but the result, although more striking, is not so rich and satisfactory as when combined with the clarinets.

Another very obvious use of the bassoons, whether there be one or two, is to furnish a *bass* where light chords of wind are played, and where the strings are for the time silent. All the lower notes of the bassoon from below the C,



are firm and solid, and equal to the task, particularly if there be two, thus:—

Ex. 28.



of carrying some very substantial chords on their shoulders. Gounod, the French composer, and a consummate artist in orchestral writing, is so fond of this rich and genial instrument, that in his sacred works he frequently uses *four* at a time.

As one instance to illustrate this use of the clarinets, horns, and bassoons in combination, I will point to the Andante in Beethoven's 2nd Symphony in D. You will

find this movement an exquisite study, such as will repay you for the most prolonged and earnest examination.

Of the *contra-fagotto*, or *double-bass-bassoon*, it is unnecessary to speak further than to caution the student as to the propriety of using it as sparingly as possible, partly because its quality of tone is such as can seldom be really needed, and also because a merciful consideration for the player should induce him to remember that he is a *man*, and not a *blast-furnace!*

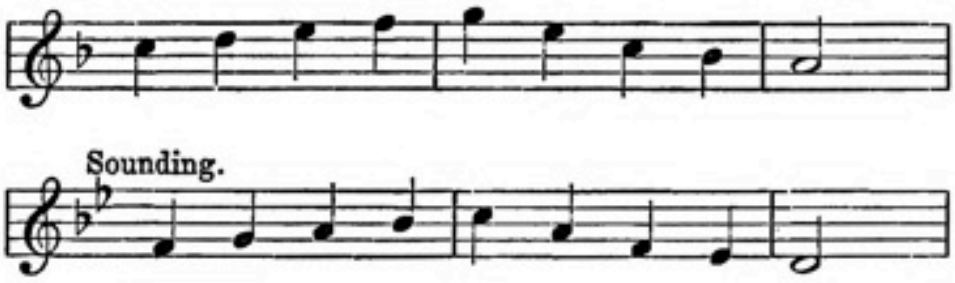
CHAPTER X.

THE CORNO-INGLESE.

The *Corno-Inglese, Cor Anglais*, or *English Horn*, as it is variously called, is a large kind of oboe, and is played with a larger reed; being of much greater length than the oboe, the upper part of the pipe, which is of metal, is bent, so as to be more convenient to the performer.

It is written for in the key of F, the notes sounding a fifth lower; thus:—

Ex. 29.



The quality of this instrument is so surpassingly tender and romantic, that to use it for anything but the occasional utterance of phrases indicating almost overwhelming gentleness and pathos, would be to use *pearls*, when *pebbles* would do.

The two masters who have specially shown their appreciation of this beautiful instrument, not only by using it, but by treating it as a rare and invaluable treasure, are Meyerbeer and Gounod.

It is essentially a solo or *obbligato* instrument, which should be heard *once* in an opera or oratorio. Like certain rare essences, the tone of the Corno-Inglese is so delicately rich, and so richly sweet, that more than a taste of it would soon pall upon the ear; and, as a good oboe-player can very soon master it, the proper treatment of this instrument is to write one piece or so for it, in the 1*st oboe-part*, so that the performer can spend the rest of the evening playing his oboe. I close my description of the Corno-Inglese by advising the student at all times to regard it as the rarest of luxuries, and never for general use.

Other instruments of wood, such as the *bass clarinet*, the *tenoroon* (a small bassoon, but vastly inferior), are so very rarely of any use in the orchestra, that they do not demand special notice.

CHAPTER XI.

BRASS INSTRUMENTS.

UNDER this head are included all instruments made of metal tubes; most are really formed of brass, but occasionally silver is used, and there is no reason, should any performer desire to possess such a speciality, why gold should not be utilised. The *trumpets*, used on the occasions of royal pageantry, are made of solid silver. Clarinets are also occasionally made of brass and even silver, while silver flutes are quite common amongst the *dilletanti*, and there are golden flutes in existence. But I believe that I am correct in stating that all genuine wind-instrument players prefer *flutes* and *clarinets* of wood, and *horns*, *trumpets*, and *trombones* of brass.

THE HORN.

The *horn*, or more strictly speaking, the *French horn*, is the most genial of all instruments, provided, of course, that your band contains two. Four horns are generally to be found in all orchestras of any consequence. One horn in a band suggests a condition of melancholy solitude.

In small orchestras, as we have them in theatres, two horns are of immense value; they add a warmth to the

inner harmonies which is beyond estimating. If you hear a small band without horns, there is a certain hard, cold, wintry feeling about the sound of it; whereas, add a pair of horns, and they seem to bring summer with them.

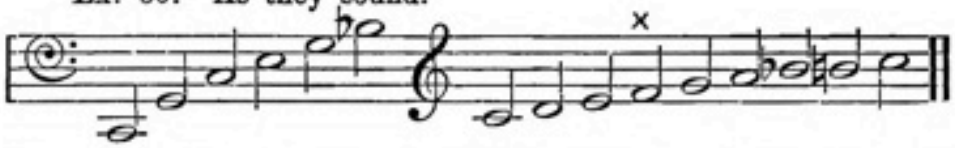
As a melodic instrument, the horn is of a most sublime character. Its tones are full of passion, pathos, and solemnity. The scores of Weber, Gounod, and Mendelssohn will afford numerous illustrations of the supreme qualities of this gorgeous instrument. Beethoven uses it too recklessly in many cases, seemingly implying that practically he had very little knowledge of the instrument; while Rossini frequently treats them like buffoons. In the opening of Weber's superb overture to *Der Freyschütz*, in the "hunting scene" in the same opera, in the "nocturne" in Mendelssohn's music to *A Midsummer's Night Dream*, and in the scene where the apparition of Marguerite is revealed to Faust, in the 1st Act of Gounod's opera, the highest treatment of the horn is revealed.

As this little volume does not pretend to deal with the mechanical means by which one learns to play on any instrument, I must here point out to the student that for information as to the use of the various crooks, and the different keys in which it is judicious to pitch the horn, so as to be most convenient for the performer, and most suitable to the exigencies of his instrument, he must either undertake to practise the horn himself for a time, or seek the necessary information from some book written for the purpose, as I can only undertake, in the scope of these few pages, to speak of instruments individually, *from a general view of their powers and uses.*

On the French horn proper, or as the Germans call it, the Wald-horn, or "horn of the woods," there are neither valves, ventils, pistons, nor cylinders. Modern use has, however, introduced upon horns all these contrivances

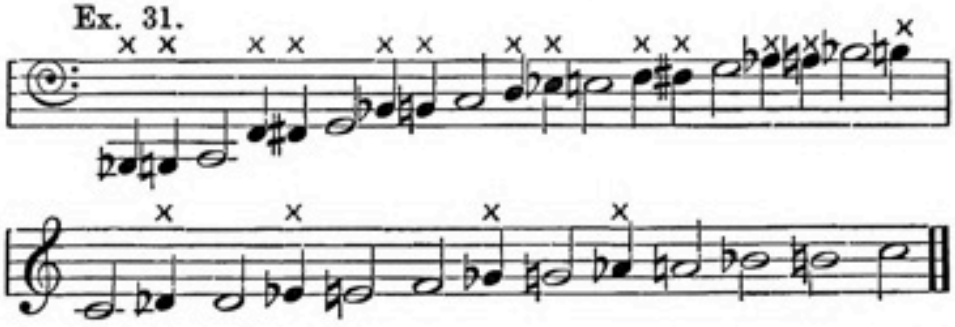
in one form or other. The old-fashioned instrument, now often called the *hand-horn*, from the fact that chromatic passages are produced by the partial or complete introduction of the right hand into the bell of the instrument, contains the following scale of open notes, mostly harmonics, and capable of being sounded by the lips unaided :—

Ex. 30. As they sound.

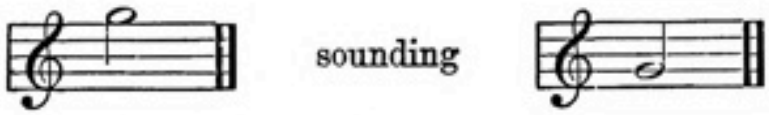


The note F is always sharp and unsatisfactory, and has to be treated as a half-closed note; while by the partial or complete closing of the bell by the right hand, the following additional notes marked × are obtained.

Ex. 31.



On the low *B flat*, *C*, *D*, and even *E flat* horns, the upper *A*, *B flat*, *B natural*, and *C* are pretty easily played, but when pitched in higher keys, one should never write above G—



or an octave lower than written.

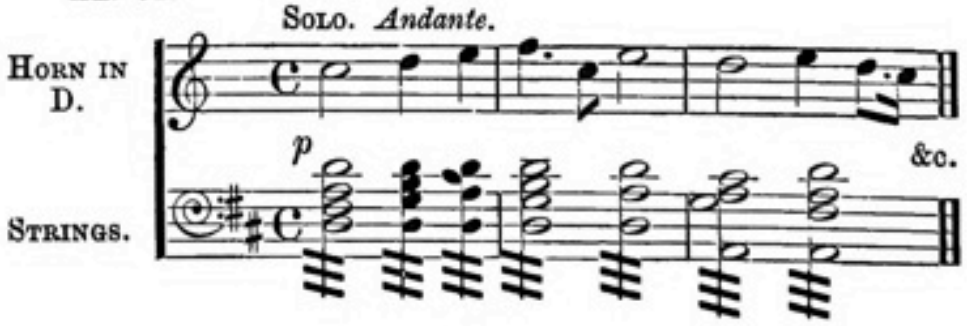
Valves, and the other varieties of mechanical appliances above indicated, supply the means of producing a perfect chromatic scale, leaving it at the option of the player whether to use his closed notes or not.

Regarding the horn as the instrument it is in its original form, and not as the mere "beast of burden" that latter usage has made it, the introduction of these artificial appliances is to be received as in some respects a very lamentable innovation. For, whereas the real French horn, revealed in every different key, according to the "crook" used, distinct and individual beauties, the use of these valves and pistons has resulted in the almost exclusive employment of the *horn in F*, by all average horn-players: They play music written for horns in *C*, *D*, *E flat*, and *E*, on a horn crooked in F, transposing, and trusting to guess-work as they go on. This inflicts great injustice on composers, for if one writes a passage for the horn in C, and designs that the tone of the *C horn* shall be heard in it, perhaps including some of its finest veiled sounds, or closed notes; it is only just that one should enjoy the common right of hearing one's design carried out. But the horn-player sits still, and complacently performs it upon the *F horn*.

It is clearly discerned that by this arrangement some of the most noble qualities of this grandest of the brass instruments are crippled, and others totally lost. Yet, if a horn-player desires to perform a solo more fit for the *flute*, let him have his valves; but it is not horn-playing.

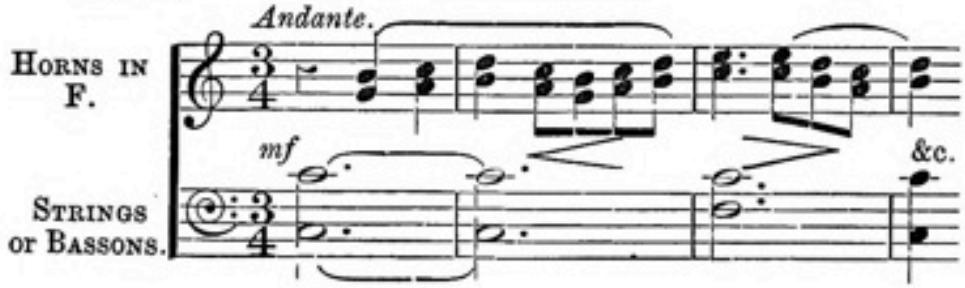
I must now point out a few of the infinite methods by which the beautiful qualities of the horn may be elicited. First, in the form of upper melody :—

Ex. 32.



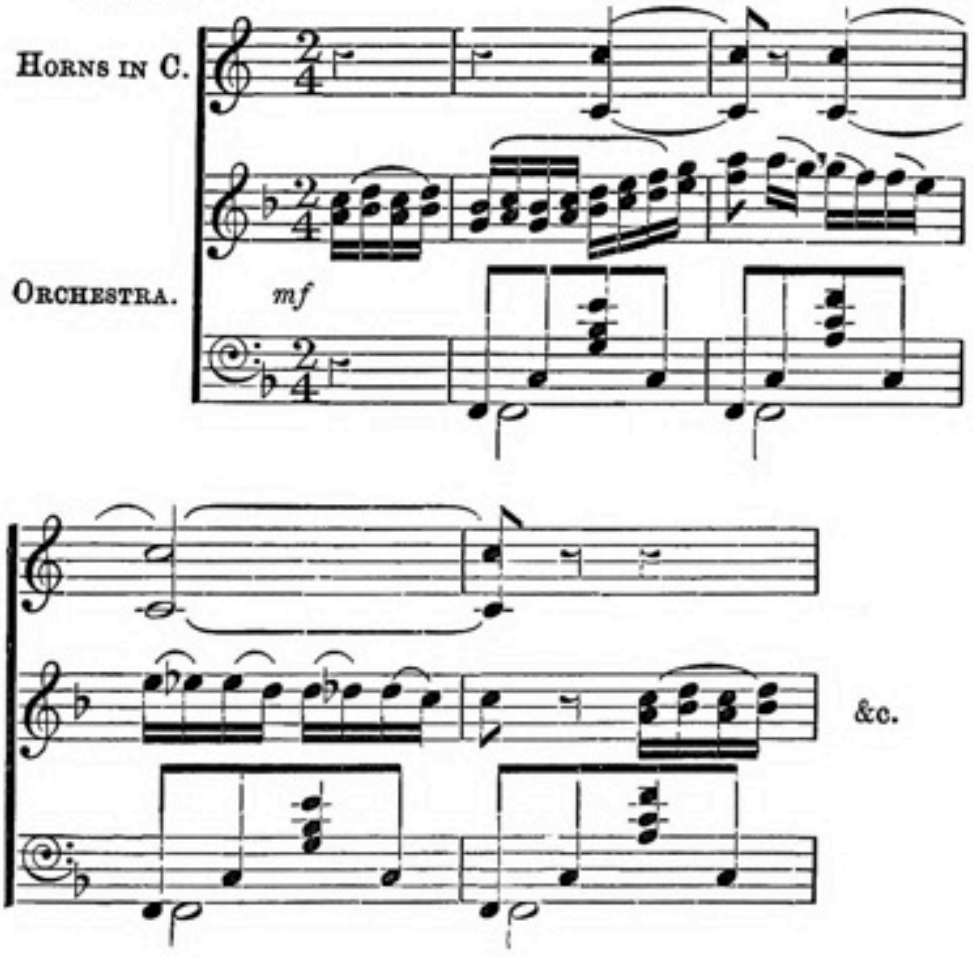
or, with two Horns sounding together—

Ex. 33.



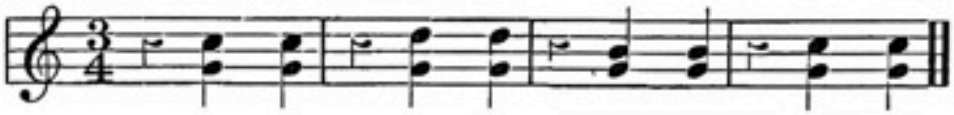
Another, and perhaps more generally useful mode of employing the rich harmonies of the horn, especially in the lower parts of the instrument, is by writing them in octaves, and frequently on the fifth of the chord; thus:—

Ex. 34.



A lamentable perversion of the fine qualities of the horn is constantly perpetrated in modern light music, especially in waltzes, and other dances, by using it thus in the accompaniment. :—

Ex. 35.



The superb tone of the instrument is sputtered away in these jerky utterances, and the performer is sadly fatigued. But in military music, the degradation of the horn reaches a climax, when a man has to waddle through the streets trying to steady a mouthpiece to his lips, which, when seated quietly in the orchestra, he can never control with absolute certainty. For mere parade purposes, it is a ridiculous waste of delicate material to make use of either *oboes*, *bassoons*, or *horns*. To play upon *violins* at the head of a regiment would not be much more absurd.

The French horn is an instrument which it is scarcely possible to render obtrusive; it blends exquisitely with any or all other instruments, and there is no ordinary combination which it will not enrich. It will strengthen strident chords on the *trumpets* and *trombones*, and play the tenderest melody in unison with the *violas*. There is no limit to its genial and universal utility.

CHAPTER XII.

THE TRUMPET AND CORNET.

When I enumerated the instruments of which an orchestra is composed, I remarked that the *trumpet's* place has been usurped by the *cornet*. This is now almost universally the case. Lamentable as this is from an artistic point of view, there are certain excuses to be made for the practice.

In the first place, the difficulty of playing the trumpet with certainty, is enormous. Its scale of notes is also so limited that it can scarcely be allowed a place amongst the melodic instruments. The only fragment of a scale producible on the trumpet is—

Ex. 36.

and the *F*, which would appear to be a "freak of nature," is too sharp for F natural, and too flat for F sharp. The use of a slide, by which to alter the length of the tube at will, was found necessary in order to play this note in tune. It will be remembered that on the horn also, this note is imperfect.

Useful, and even effective as the *cornet* when properly played may be, the magnificent *trumpet obbligati* of Handel, and the fine and noble use of the instrument in the works of all the great composers, call relentlessly for the *trumpet*, which was written for, and will lend themselves to due illustration upon no substituted instrument.

But the cornet, having in all directions been admitted as the trumpet's successor, it is only necessary to say that if you desire to write *pure trumpet parts* in your compositions, you will have them played correctly, though with an inferior tone, by *cornets.*

The prevailing vice of performers upon this instrument (and strangely enough, it is mostly to be found with the most celebrated players), is the habit of *over-blowing;* the effect produced by this fault is one of blatant vulgarity. The consequence is that sometimes, if you have a band of your own, you will have to request the cornet-players to play about one-fourth as loud as they are accustomed to.

The instrument itself, at the best, is in a measure faulty in construction, but as it is in constant and increasing use, we had better accept it, and make the best we can of it.

There may be said to exist three methods of writing for the cornets. In serious works, such as oratorios, symphonies, &c., it is proper to treat them as *trumpets*, in this manner:—

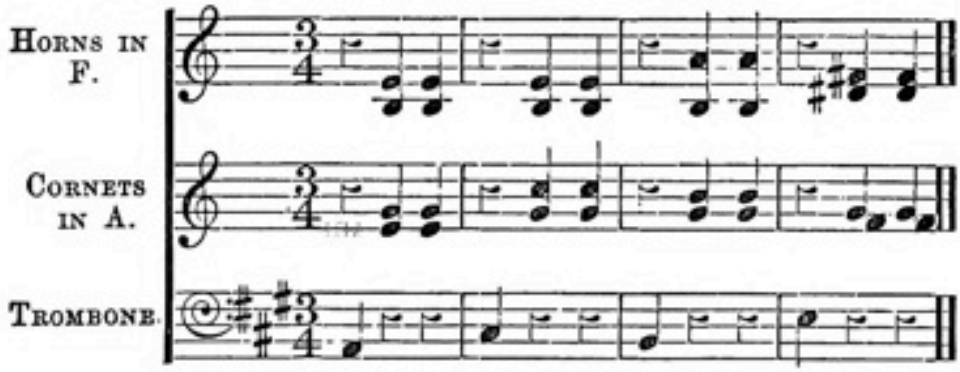
Ex. 37.

The second method is to use them, but only in lighter styles of music, as melodic instruments, but with the

greatest moderation, and avoiding the higher notes of the scale. As a rule, moreover, the best qualities of the cornet are obtained in *mezzo-forte* and *piano* passages; if written *forte*, they are apt to get into their solo "*blare.*"

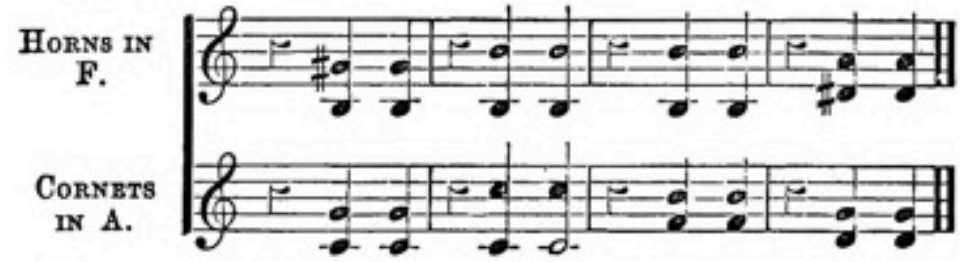
The third method is to use them in the harmonies of the accompaniment. I refer now exclusively to light music: dramatic overtures designed for theatrical use, operas, dance-music, and so on. Combining them judiciously with the *horns* (I speak of music destined for performance mostly in such places, as there are only two horns), with a *trombone* playing, or adding to the bass-part, very bright effects are procurable; thus:—

Ex. 38.

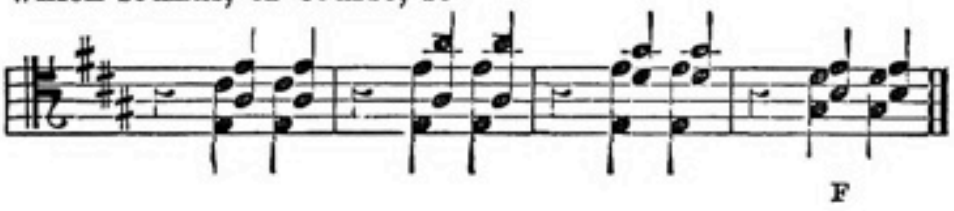


and sometimes the effect is improved by making the *2nd cornet* and *1st horn* cross over; thus:—

Ex. 39.



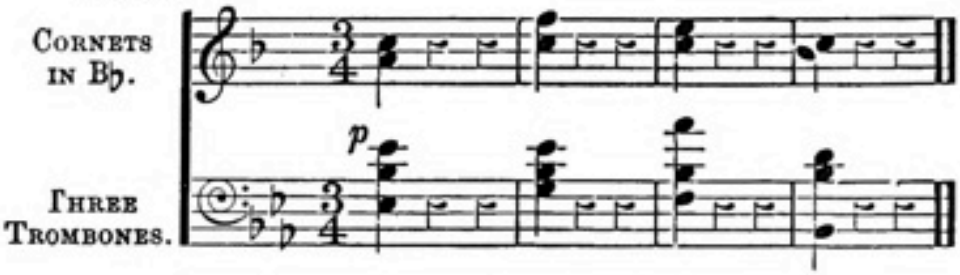
which sounds, of course, so



although this use of the horn is the lamentable one which custom has rendered so common.

A modification of this method is afforded in the following example, in which, in a large orchestra where there are three *trombones*, the Cornets in company with the trombones are very effective in emphasising the first note of each bar by a full rich chord (this is peculiarly applicable to the higher class of waltz-music).

Ex. 40.



Common judgment will teach all further necessary things in respect to writing for this instrument.

CHAPTER XIII.

THE TROMBONE.

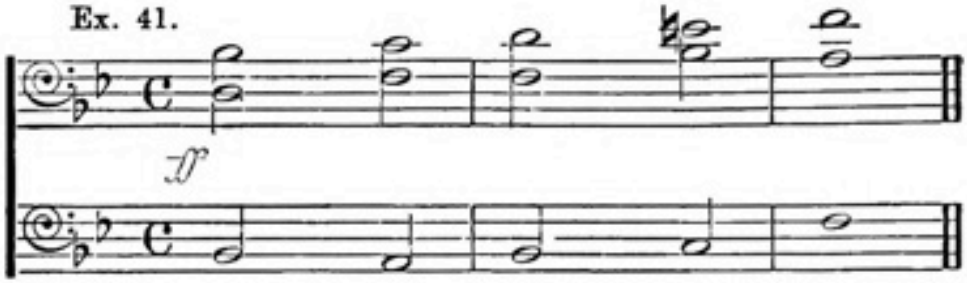
The *Trombone* is an instrument of remarkable power, and of a versatility truly remarkable. It is the only wind-instrument which possesses absolute perfection of intonation, the entire scale being equitonal. What would be otherwise tenderly sympathetic in the tone of the trombone is unfortunately marred somewhat by the square, uncouth nature of its mechanism; for, whereas the notes on the horn glide smoothly and almost melting one into the other, on the trombone the performer has to go through a species of athletic exercise in order to lengthen his tube so as to get a lower note out of it.

In a small orchestra where there is only one trombone, that unfortunate is compelled to hide some of his best qualities through the lack of the companionship of two of his brethren, three trombones being capable of producing the noblest effects. Thus a trombone in a state of loneliness cannot do much more than here and there supplement the other bass instruments. In light music, a *staccato* bass on the trombone is bright and pleasing.

But in a complete orchestra, the trombones furnish the three lower notes of a magnificent quintet, of which the two trumpets (or cornets) represent the two higher parts.

Chords such as the following are hugely effective, with or without the trumpets :—

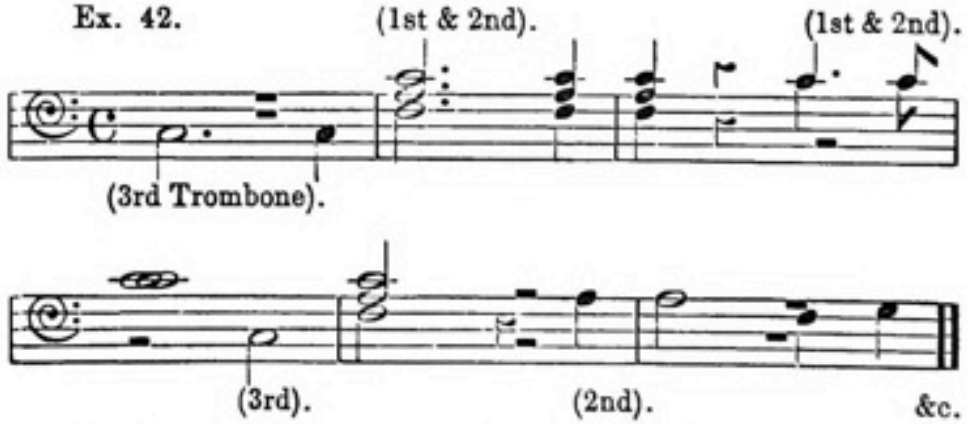
Ex. 41.



Formerly, and indeed until quite recently, *alto*, *tenor*, and *bass trombones* were used, each written for in their respective clefs, and on a different line. One method is to write for two trombones in the tenor or alto clef, on one line, and the bass on a line by itself; but the simplest method is to write the 1st and 2nd trombones on one line, the third on another, and all three in the bass clef.

If your score be cramped for room, there is no reason why you should not write them *all three on one line*, but in this case you must be extremely careful to keep each part distinct, as in such a case as follows :—

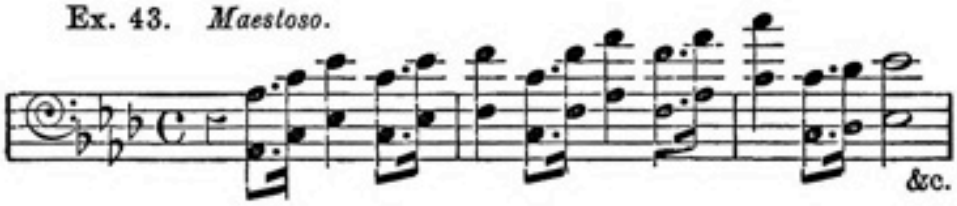
Ex. 42.



The trombones are capable of the loftiest utterances. The initial announcement by three trombones in unison,

of the principal motive in the "Lobgesang" of Mendelssohn, will fully bear out this statement. And a strain of martial or heroic melody, if given to two trombones in octaves, in the higher register of the instrument, so—

Ex. 43. *Maestoso.*



will be found superb, if with proper accompaniment.

In the oratorio of *Elijah*, in the tenor song near the end, "Then shall the righteous," Mendelssohn uses two trombones in octaves with singularly lofty and beautiful effect.

A fine trombone-player can give a blast upon his instrument absolutely horrific in its fury, and shortly afterwards he will play a solo worthy of the violoncello!

There are two kinds of trombones, the original one played with a slide, and an inferior one played with valves. The valve-trombone is largely in use on the Continent, but in England it is mostly found in second-rate regimental bands.

CHAPTER XIV.

THE OPHECLEIDE, EUPHONIUM, BOMBARDON, BASS-TUBA, AND DRUMS.

There are, in the present day, very few performers on the Ophecleide, consequently its almost entire disuse. The other bass brass instruments enumerated above, have severally taken its place. Being constructed somewhat on the principle of *bass* and *double-bass cornets*, they are comparatively easy to play, considerably more so than the *ophecleide*, which was a sort of reproduction, octaves below, of the old-fashioned *key-bugle*, an enormously difficult and laborious instrument.

When introduced into an orchestral score, the proper position of any of these instruments is either in unison with (in loud parts), or an octave below, the 3*rd trombone*.

In military bands, these instruments naturally occupy the position of the violoncellos and double-basses of the

orchestra, and if judiciously subdued, they form a very fine bass.

DRUMS, &c.

It is a common belief with the untutored that a *drum* is purely an engine for the production of noise. A more pitiable mistake was never made.

The offices rendered by various kinds of drums in orchestral music, whether purely symphonic, operatic, religious, or oratorio performances, are as significant, potent, and dignified as those of the finest human voices.

The most refined of the drum family is the kettle-drum, so called from the resemblance of its shape to that of a large kettle or cauldron. Kettle-drums are made better in Germany than in this country. In English orchestras you frequently hear a whole performance ruined by the excessive banging of skin-covered cauldrons about three times too large for the realisation of any musical purpose.

Kettle-drums, which are generally tuned to the tonic and dominant of the key, for the time being, ought to be made, both as to the true acoustic perfection of their shell (as in the case of a church bell, cast so as to be true in sound), and the accuracy of their tuning apparatus, as that their sound, when struck, should resemble several *violoncellos* playing the note in *pizzicato*.

To the kettle-drums belong the wonderful gift of imparting to orchestral utterances the character of accent and emphasis, of which no other instrument, or body of instruments, is capable. And how can this quality be over-rated?

In a certain degree, in colossal and tremendous effects, the same quality appertains to the *bass-drum* and *cymbals*.

The *side-drum* is an instrument of inferior character, and is most in its element when in the company of bayonets, carried by men who march to it. It is by no

means an orchestral instrument. At the same time, it is useful in peculiar situations; the alarm-like, menacing, angry rattle of the side-drum finds a place in certain stirring moments, even in orchestral music, while in opera it is useful because it serves to sharpen the significance of certain warlike moments; but the employment of the *side-drum* alone, without either the *timpani*, or the *bass-drum* and *cymbals*, in a small orchestra, and especially in dance-music, is like regulating the movements of a ball-room by a policeman's rattle.

The *cymbals*, generally clashed in company with the strokes on the *bass-drum*, produce a legitimate, and at times a very fine effect. In military music they are quite necessary. The *triangle* is also capable of adding much to the effect of graceful passages, but in the use of all kinds of solid and artistic instruments of percussion, judgment is the only guide. According to their proper use, drums of all kinds are but as the deeper and more solemn colours in a picture.

Once, while taking a country walk, I happened on the funeral of a military officer of high rank. The road I wished to cross was occupied by the passing hundreds of the procession, and the spot being in the neighbourhood of an important garrison, there were several military bands. As I stood, watching the impressive and pathetic pageant, I discerned the sounds of a military band some distance away, but slowly approaching the spot where I stood. They were, however, near enough for me to catch the sublimely simple and touching strains of Handel's "Dead March" in *Saul*. The music was just audible, and at stated intervals the sound of the *muffled bass-drum* fell on the serene air of this October afternoon. Should I live for a hundred years I shall never forget the effect produced upon my feelings by the almost more than human "sobs" that thrilled through the atmosphere from this solemn instrument.

When I first heard an oratorio performance under the dome of St. Paul's Cathedral, I experienced many wondrous revelations. The benign loveliness of many orchestral combinations chastened me by reason of their ineffable sweetness; but it was not until the *drums* rolled, that I realised that I was in the presence of music in its divine majesty.

CHAPTER XV.

COMBINATION OF THE INSTRUMENTS.

In the following pages, it must be understood, that my remarks as to the treatment of the various orchestral instruments, will apply to them only as being parts of a grand orchestra, such modification of their uses as may become necessary in dealing with a band of curtailed proportions being left to the judgment and fancy of the student.

I must first warn my readers as to the extremely limited quantity and quality of the actual information it will be possible to convey while dealing practically with this subject. He who would teach the mystery of orchestral writing is in the same position as one who would teach you to paint or to write verses. All that the artist can do is to reveal the mere mechanical ways of mingling colours, and the best way to lay them upon the paper or canvas; he cannot teach you to invent combinations. Nor is any living soul capable of teaching poetry; one can instruct you in the mechanical formation of correct verse, but no one can teach you to conceive a

poetical idea. My office in writing this little book is as that of a gardener who takes you into his garden, and shows you his beautiful flowers; he can give you seeds and cuttings, and teach you how to plant them, but neither he nor you can make them grow. That belongs to a higher power; and so with all manner of musical work: one may be taught the methods, but the secret of using them is kept by nature to herself, and reserved alone for her own handiwork. This assistance on the part of nature is called by some people genius, by others inspiration. And let me faithfully and gently offer one further remark before proceeding to details. never imagine for a moment that the orchestra is a medium for the exhibition of your talents. It is the greatest privilege of the greatest composer that could possibly exist, to be permitted to use his genius in the display of the endless and divine beauties of the orchestra.

The study of the orchestra is like a vast collection of treasures; and when you have devoted a long life to this subject, you will end by having a far more lofty estimate of it, and a much lower opinion of your own powers of dealing with it. But this is the lot of all who hold communion with the Infinite. However, learn little as you will, it is the most beautiful study known.

I have already given a full description of the treatment of the *stringed instruments*, and we will now proceed to consider the method of combining with them the wind instruments, in such ways as may be as nearly as possible what orchestral "tone-painting" ought to be. I use this popular cant term with the deepest significance, as I will show.

The orchestra is constituted of three distinct bands—the *wood-band*, the *brass-band*, and the *string-band*, with an element of *percussion* over and above. The judicious mingling of these three bands is the secret of scoring for the orchestra.

And in order to render clear the process of this beautiful art, it is necessary to recur to, and enlarge upon, a certain analogy which I brought forward in the first chapter, the relation between *colour* and *sound*.

One who writes for the orchestra stands in a peculiarly similar position to that of one who paints a picture. The musician is dealing with form, shade, and colour that appeal to the ear, while the painter is making similar provision for the gratification of the eye. I have already urged upon the student the absolute necessity, in both these cases, of making form all that it ought to be, before attempting to introduce colour.

The analogy between music and picture is so close, and so important, that I am utterly unable to understand how it is that it has never been insisted upon as a most important element in the education of musicians. I will fully explain this statement.

A composition scored for the orchestra, and then arranged, or compressed, as a piece for the *pianoforte*, represents to the smallest detail of method, the reproduction of a painting by an engraving, etching, or other monochrome.

In the orchestral form, as with the painting, you have form, light and shade, expression, and *colour;* in the pianoforte arrangement, as in the engraving, you have form, light and shade, and expression, but *no colour*.

But we can carry the analogy much further. There is absolute sympathy between the qualities of colour in painting, and the qualities of sound in music. I would scarcely suggest, however, that the comparison should be carried out so far as to assign a similarity to actual, individual colours, to each class of instrument; chiefly because there are only nine varieties of instrument in an ordinary orchestra, while no man can number the varieties of colour that are visible in nature; therefore it is impracticable to go beyond the idea of general resemblance.

My theory is based upon the fact, that while the substance of the orchestra is the *strings*—which are all of one quality of sound, but infinitely various according to treatment, expression, and so on—the vastly prevailing colour in nature is grey, in ten thousand varying hues.

No matter how brilliant the colours in a picture may be, we shall find that sombre tints pervade the greater portion of it, the bright, flashing colours being greatly in the minority; just as in the orchestra, the tone of the *strings* pervades the whole mass. Furthermore, if you look at any object in nature which consists entirely of a bright colour, the light falls unequally upon it, and shade varies even its one hue; this may be said to be what expression is in the performance of a bright-toned instrument, such as the *trumpet*, the brightness of its tone being varied by the power the performer possesses of playing from *pianissimo* to *fortissimo*.

The application of this theory is that the tones of the *oboes*, *clarinets*, *bassoons*, and *horns* answer to the quality of such colours as are moderately bright and rich, while those of the *trumpets* and *trombones* are as those more approaching to scarlet, purple, deep blue, and rich brown.

Try to imagine a picture in which these four latter were the only colours, even allowing for varieties of shade and a degree of mingling, and you will have before your mind's eye something like what would be presented to your mind's ear, if you sought to realise the effect of a movement played entirely by *trumpets* and *trombones*.*

And now imagine that you are gazing upon a beautiful and varied landscape composed of trees, hills, meadows, and flowers; a blue sky, in which are careering a host of ever-changing clouds, some bright as burnished silver, and others of dark grey; while somewhere amongst the infinitely various tints of tender green there is seen a

* It is this which renders it impossible to listen with much pleasure for any length of time to a band composed entirely of *brass instruments*.

group of figures, a few of them in scarlet cloaks, and you will have a display of colour, certainly, it must be admitted, of infinitely greater actual variety, but blended in the same beautiful proportions that govern the resources of orchestral music when the work of a master.

I state plainly, without fear of ridicule, that the only lesson in scoring that I ever received from man (for what little I otherwise know I owe to nature, assisting me in observing the works of her great pupils), was derived from sitting once beside a great water-colour artist, while he painted one of the exquisite little landscapes for which he is so justly famous.*

But I must now leave this theory in the hands of such as may think it worth their while to investigate it further for themselves, dismissing it with the remark that no hard and fast rules either in music or picture will avail to make a great colourist. Genius alone can guide the hand.

* Birket Foster.

CHAPTER XVI.

COMBINATION, &c.—*Continued.*

The most important principle to be observed in all orchestral writing is to keep your score clear, transparent, and free from any combinations which will produce confusion when heard. There is no restriction as to writing any conceivable passage for any instrument, or combination of instruments—of course provided that they are such as are playable—*as long as you show a reason for your doing so.* By this I mean that as long as you steer clear of the slightest pedantry or purposeless eccentricity, the whole range of instrumental wealth and treasure is absolutely at your disposal, to deal with at your will. An eternal and infinite space, full of the elements of beauty, awaits your command to shape themselves into lovely worlds and planets.

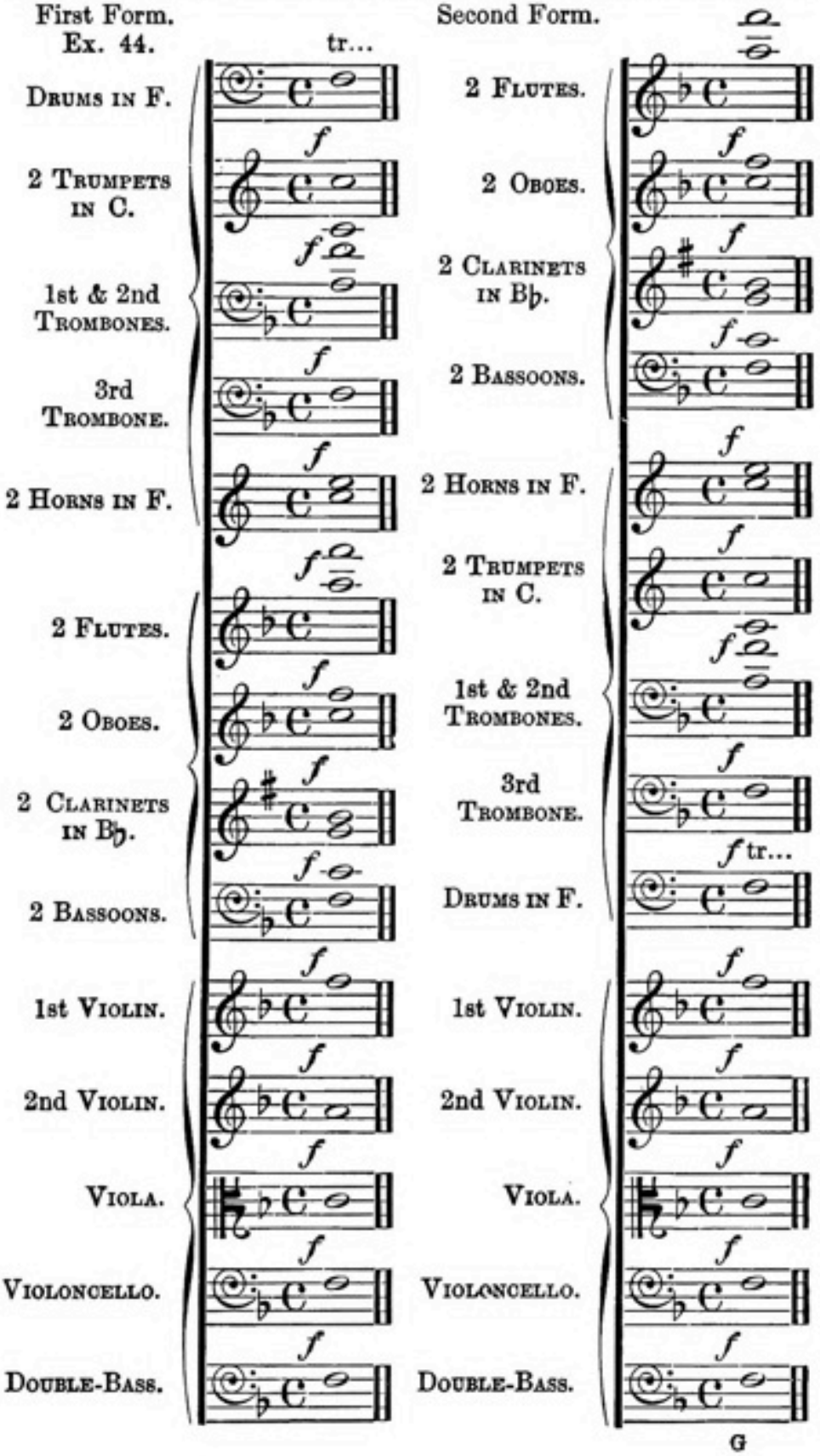
And I cannot here refrain from a passing remark as to an aspect of the orchestra, that is to say of an orchestral band, at such moments as it happens to be a mere company of individuals awaiting control. I allude to the

interval which occurs between the time, say, at a concert, when the musicians begin to take their places in the orchestra, and the moment when the conductor gives the signal to commence the performance. To me, personally, this is a period of intense enjoyment. And why? It is a time of exciting expectation, not unaccompanied by rich promise. Each musician, as he arrives, prepares his instrument: the violinist is adjusting his "fifths;" the wood instruments are throwing off roulades and cascades of joyous notes; the brass instruments are trying their strength; bouquets of wild, tender notes, like the sounds one hears in a wood where nightingales are, fall upon the ear; there is a rich sound of untamed elements, like the voice of the wind as it stirs up the life of a forest; but the sound we now hear is infinitely more grand and significant, because it is the voice of a chaos which is only awaiting the control of one spirit to reveal the stupendous grandeur of a perfected creation. To such as object to the preliminary tuning of an orchestra, I say, that their affectation blinds them to a noble revelation.

We must now speak of the preliminary arrangement of the score.

Different composers have used several methods of disposition; some place the *drums* at the top, followed downwards by the *trumpets* and *trombones;* the *horns* follow; then the *wood-wind*, commencing with the *flutes*, the *bassoons* lowest; finally the *strings*. Another plan is to place the *flutes* at the top, the remainder of the *wood-wind* following; then the *horns*, followed by the *trumpets* and *trombones;* the *drums*, and then the *strings*. Beethoven, Mozart, Schumann, and others, have used both forms; but the second is, and always has been, in most general use, and it cannot be disputed that it is the best of all forms of score, for the simple reason that the higher sounds are at the top of the page, while the lowest are at the bottom. Observe the two forms:—

First Form.
Ex. 44.



Second Form.

and a glance will convince anyone as to the superiority of the second form.

When voices are included in the score, as in opera or oratorio music, the principal or solo voices should be above, and the chorus parts underneath them. Some composers place the voices in the middle of the *strings*, that is to say, between the *viola* and *violoncello*, but I prefer to place them between the *drums* and the *strings*. This leaves the strings undivided, and thus the reading of the score is rendered easier, the strings being, as we have seen over and over again, the most important part of the orchestra.

If the *harp* be used, it is best to place it immediately above the *strings*. The harp is a magnificent orchestral instrument when used discreetly.

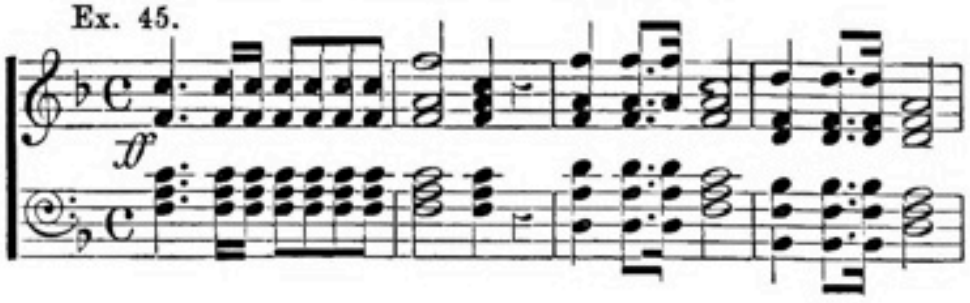
If your composition be a sacred one, and the *organ* be included, the organ-part is best written at the foot of the score.

In the case of a *concerto*, the solo-instrument part is best discerned when placed immediately above the *strings*. All other details of arrangement are left to the discretion of the student.

The proper use of the orchestra depends necessarily upon the particular purpose you are at the time fulfilling. For instance, in loud passages, such as in a march, or certain parts of a symphony or overture, your dealings with the various instruments will naturally be of a much less cautious character than when you are writing delicate passages, where there is scope for the most refined and tender expression. In writing loud chords for the full orchestra, you have merely to regard the most judicious manner of grouping the three bands.

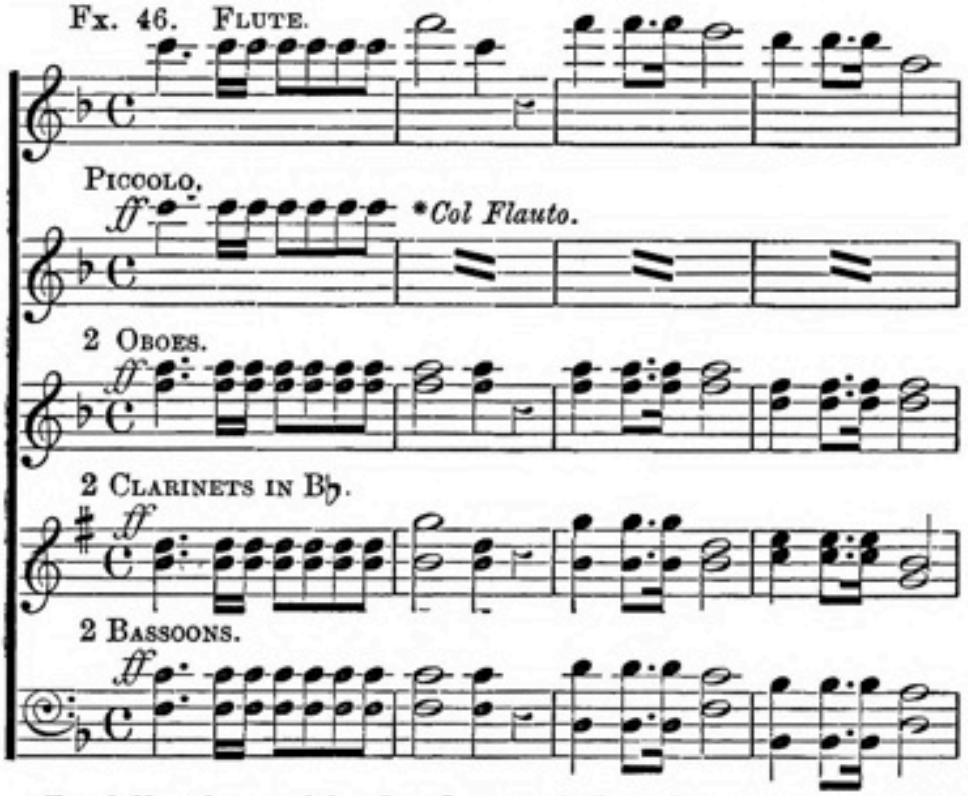
Take four bars of a march in pianoforte form :—

Ex. 45.



and we will first see how to arrange the *wood-wind*. In following out the process of scoring these four bars for full orchestra by taking the *wood*, *brass*, and *string* bands separately, I by no means desire to establish a rule of procedure; it is merely as a mode of dissecting the anatomy of the score; a practised writer for the orchestra will cover twenty pages of score-paper with the merest fragments of instrumentation, filling in the remainder afterwards. (In the following example, you will see that the *flutes* have a line each, which is necessary when the *piccolo* is used.)

Fx. 46.

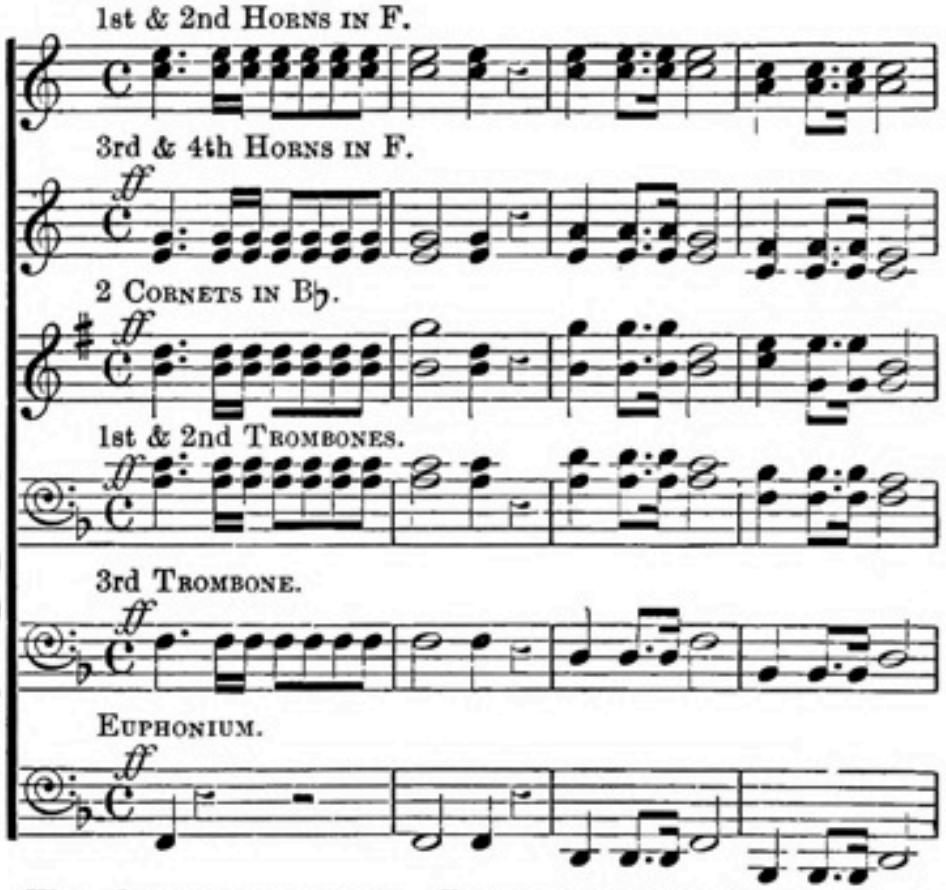


In following with the *brass-wind*, it is to be observed that in order to obtain a fair balance of the tone, the utmost care must be taken to write in five good parts for the two *trumpets*, and three *trombones*. (I say *trumpets*, but in a specimen of light composition, such as a march of this character, you would unquestionably use *cornets*.) The *horns* are not to be controlled by this discipline,

* Where two parts are exactly similar for a time, this is a legitimate means of saving trouble.

because their utility lies more in the way of sustained harmonies, although I do not treat them thus in the present case.

Ex. 47.

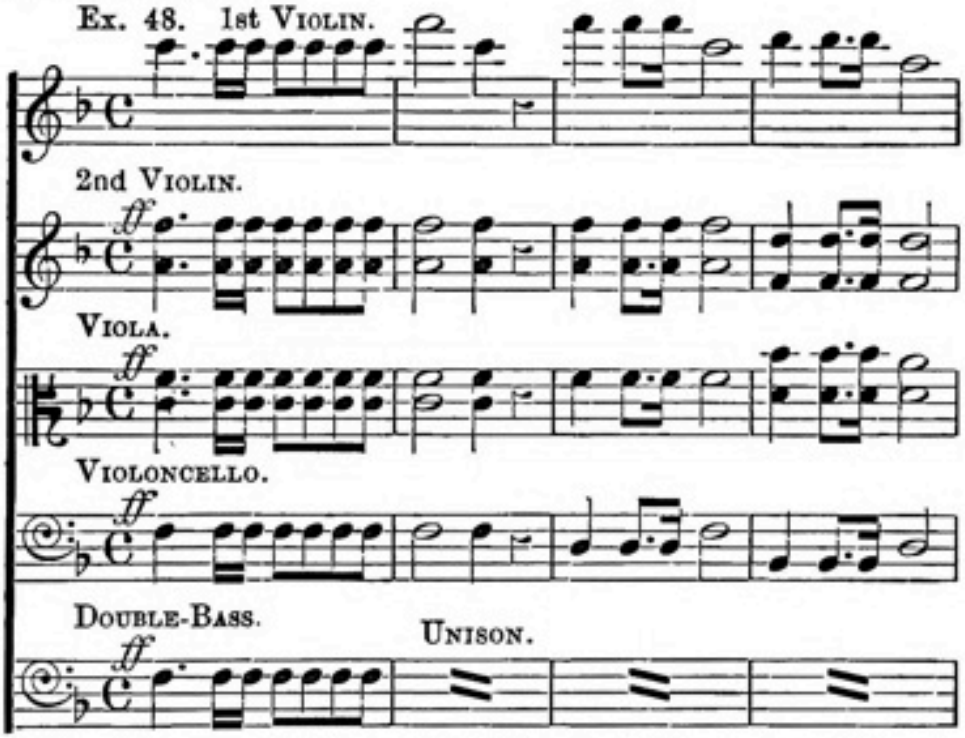


The *drums* come next. I am supposing that all three kinds are used; although, as a rule, it is only in very rare cases, except in the matter of a few final bars, that there is any excuse for using the *bass-drum*, *side-drum*, and *kettle-drums* all at once. The effect of one would spoil that of the two others, generally speaking. In writing for the *timpani* or *kettle-drums*, as has been before stated, the tonic and dominant of the key are used. It is not wise, therefore, to give a note to either of these drums, except it appear in the chord being played. To illustrate this, it is only necessary to give two instances. If the piece be in the key of C, the drums will be tuned thus:—

and they should not be sounded in any chord where the C and G are not heard. There are very rare exceptions to this rule.

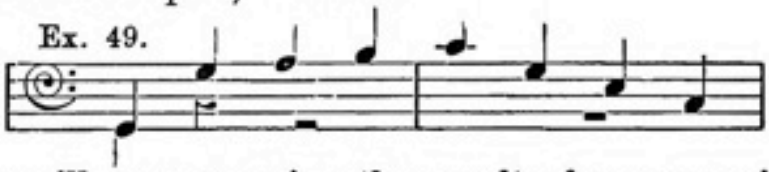
Proceeding to the *strings*, we should probably write for them so :—

Ex. 48.



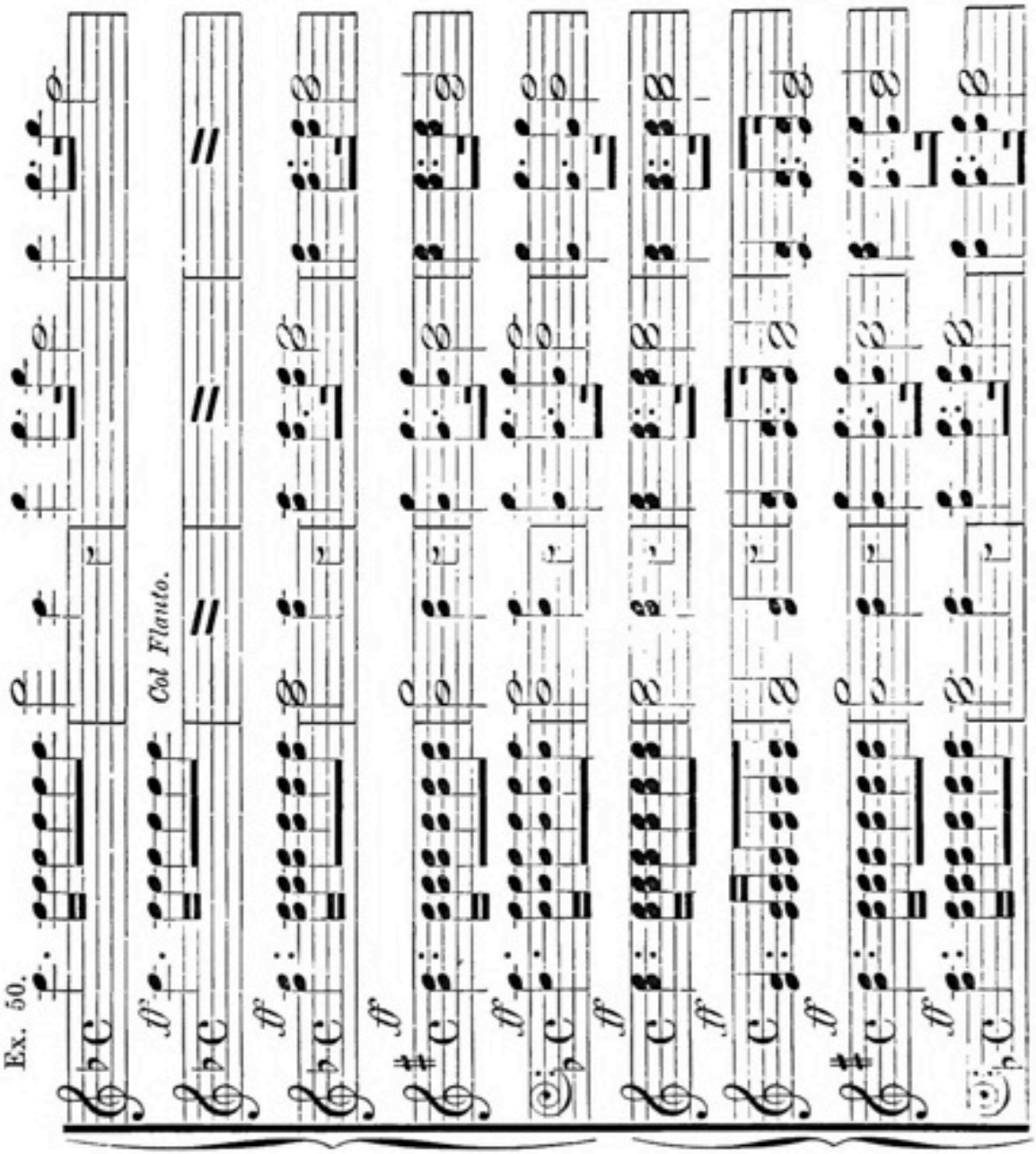
I will remark here that if you find no necessity to separate the *violoncello* and *double-bass* throughout your composition, you can write for them both as *one part on one line*. And even if you should leave out the *double-bass* occasionally, and let the *violoncello* be heard alone, you can indicate the same, by supplying rests below the violoncello-part, thus :—

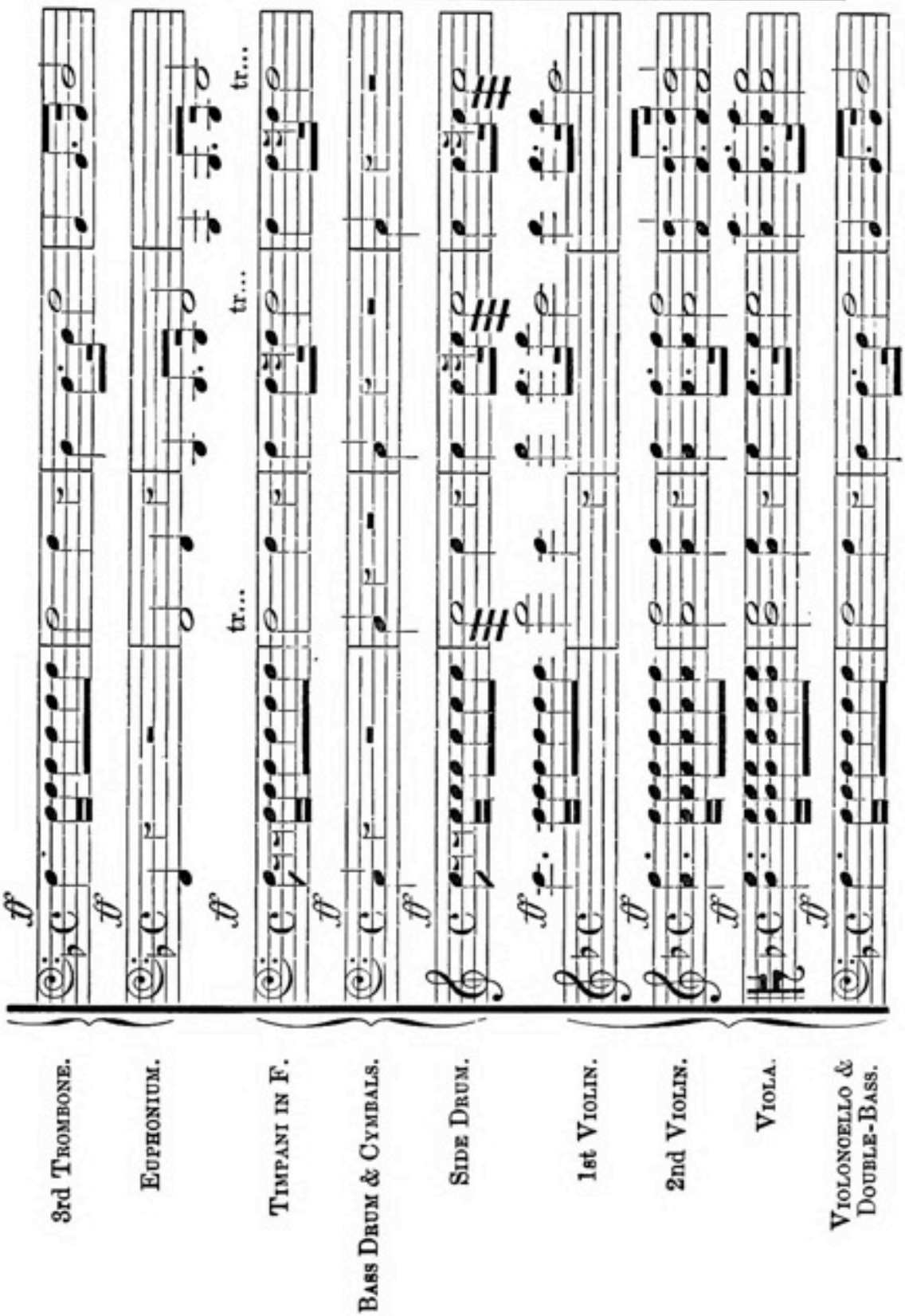
Ex. 49.



We will now examine the result of our grouping of the distinct bands :—

Ex. 50.


Col Flauto.
Flute.
Piccolo
2 Oboes.
2 Clarinets in B♭.
2 Bassoons.
1st & 2nd Horns in F.
3rd & 4th Horns in F.
2 Cornets in B♭.
1st & 2nd Trombones.


3rd Trombone.
Euphonium.
Timpani in F.
Bass Drum & Cymbals.
Side Drum.
1st Violin.
2nd Violin.
Viola.
Violoncello & Double-Bass.
tr...
tr...
tr...

and we find, that by having arranged them with due regard to the qualities of their component parts, we have produced what may be regarded as an approach to perfect orchestral balance.

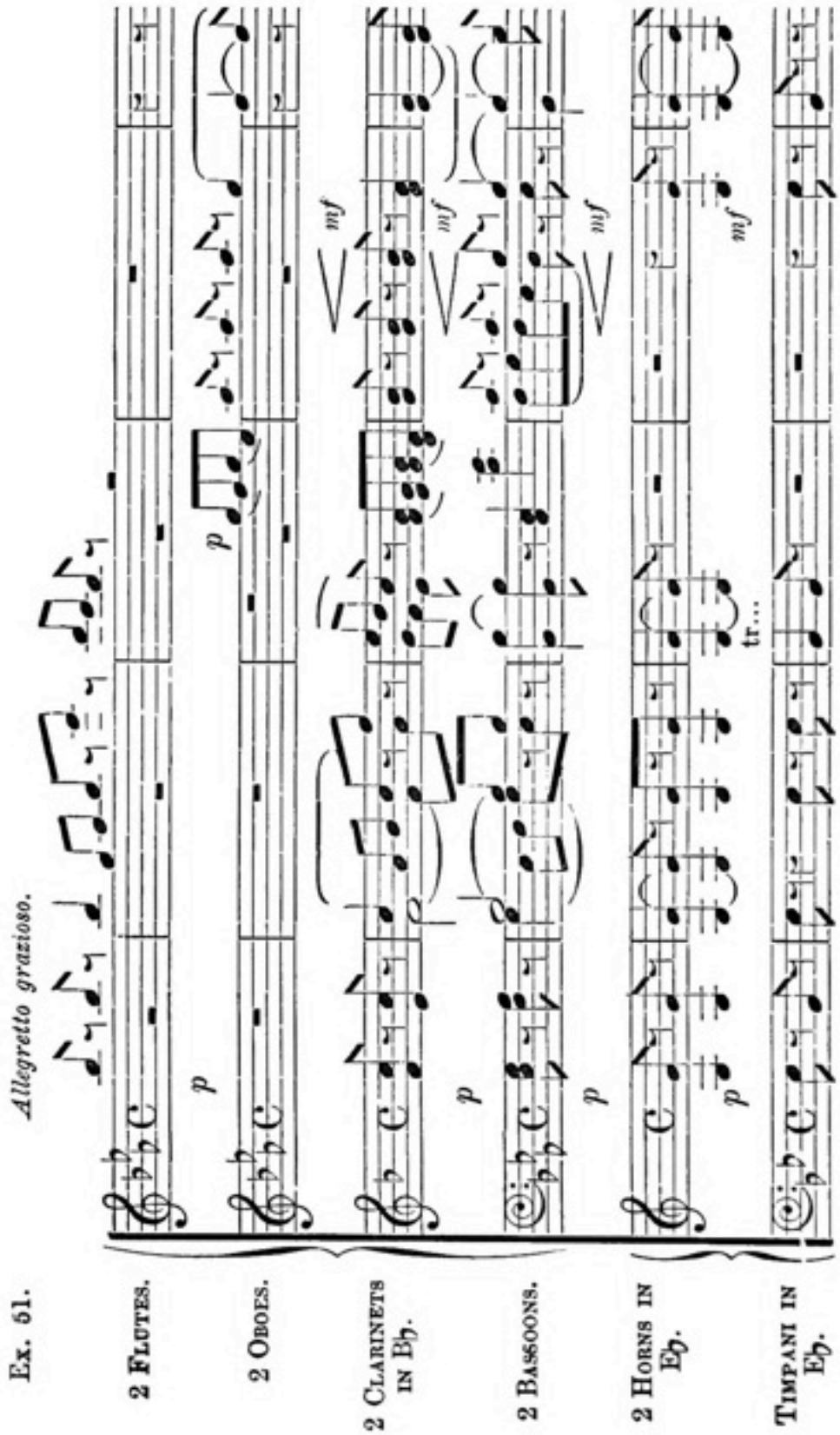
CHAPTER XVII.

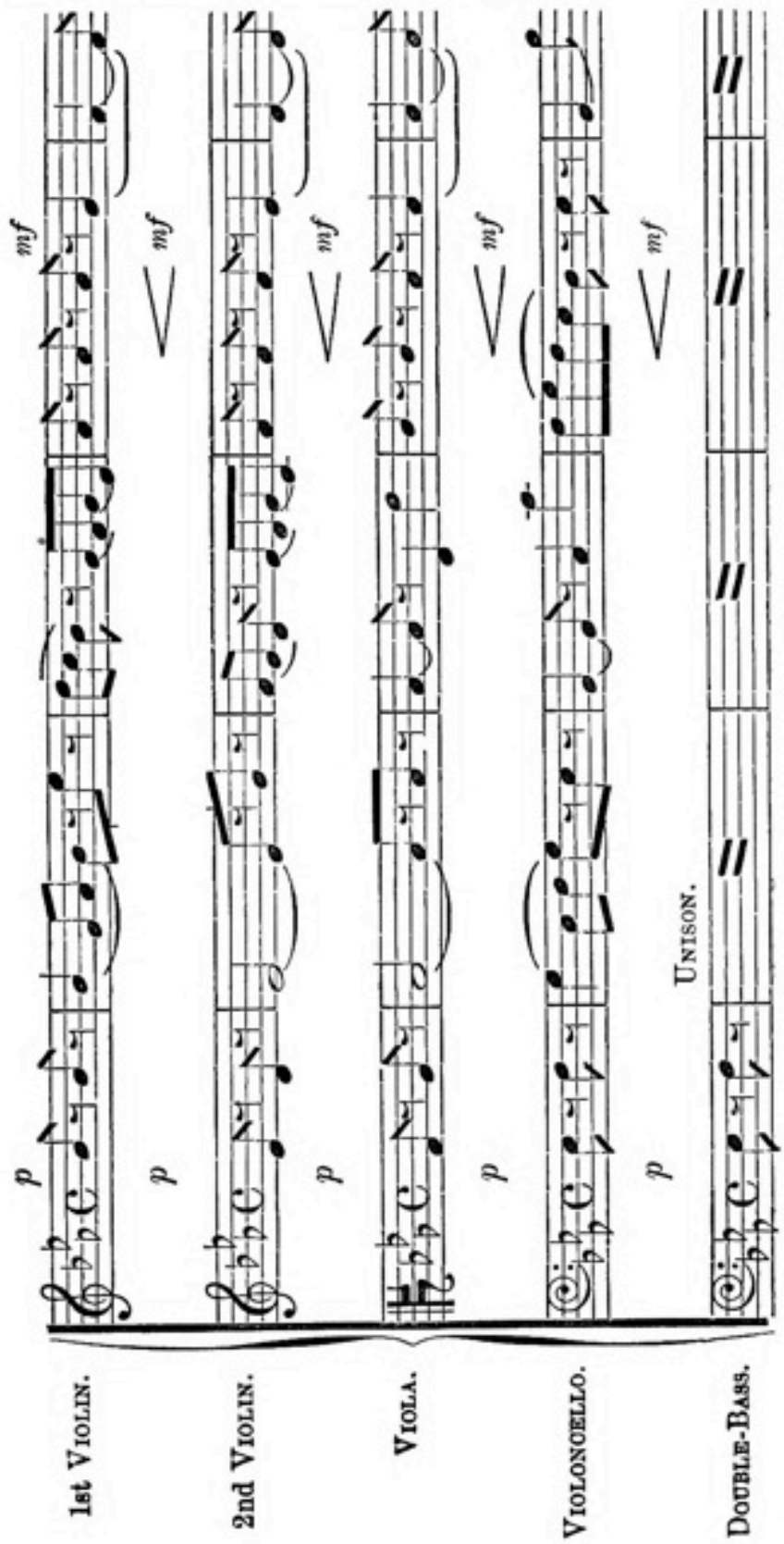
OTHER FORMS OF COMBINATION.

I WILL now bring forward one or two examples of a more delicate form of orchestration, such as one would find in the more refined portions of a symphony, or other form of orchestral composition. We shall here discover a greater refinement of colouring than in the last-quoted case, which is little more than an attempt to display a fair method of distributing the simultaneous efforts of the entire orchestra.

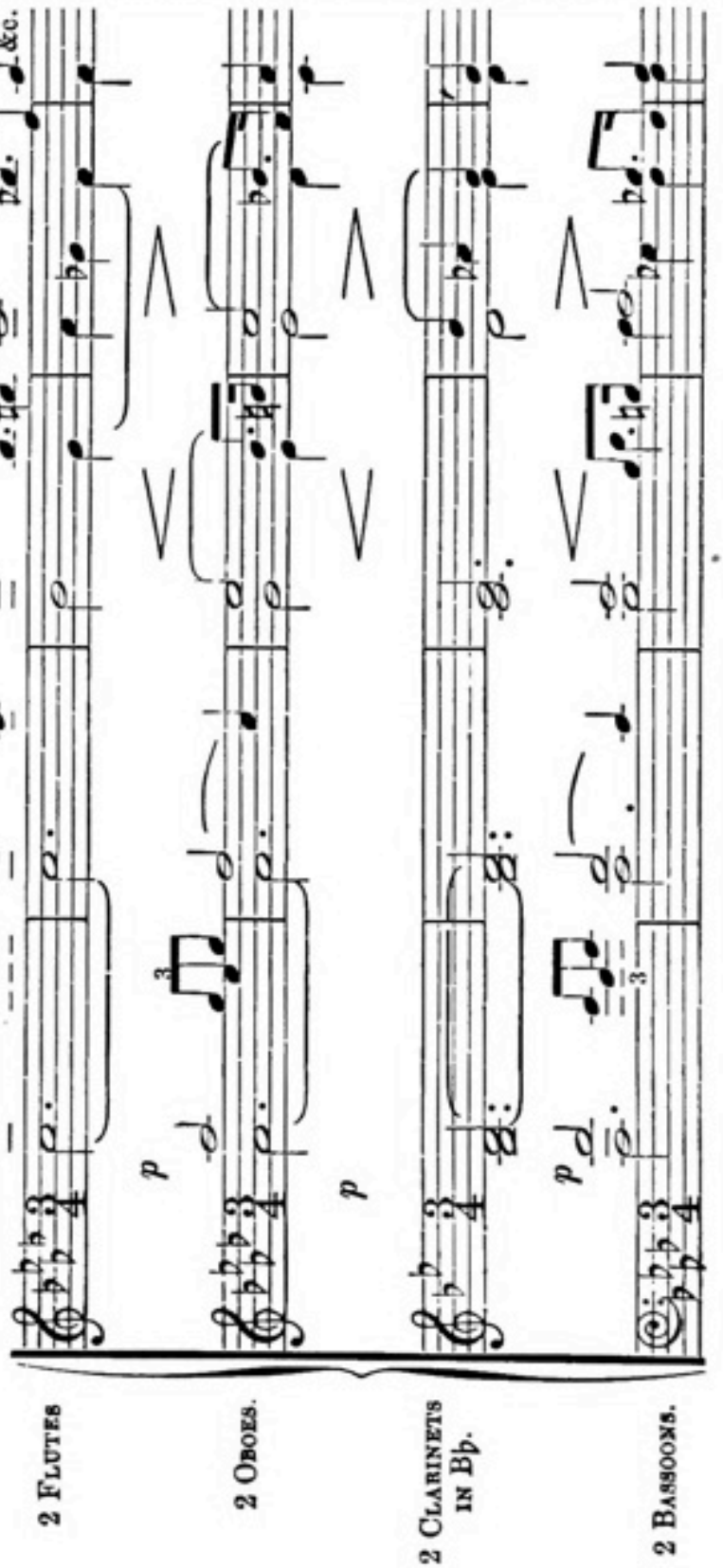
The first of the following examples is a fragment of an imaginary "Gavotte," and it will be seen at a glance that the score is bare of *cornets* and *trombones*, there being no necessity for the use of strident brass in order to realise the expression, colour, light, and shadow in such a slender conceit:—

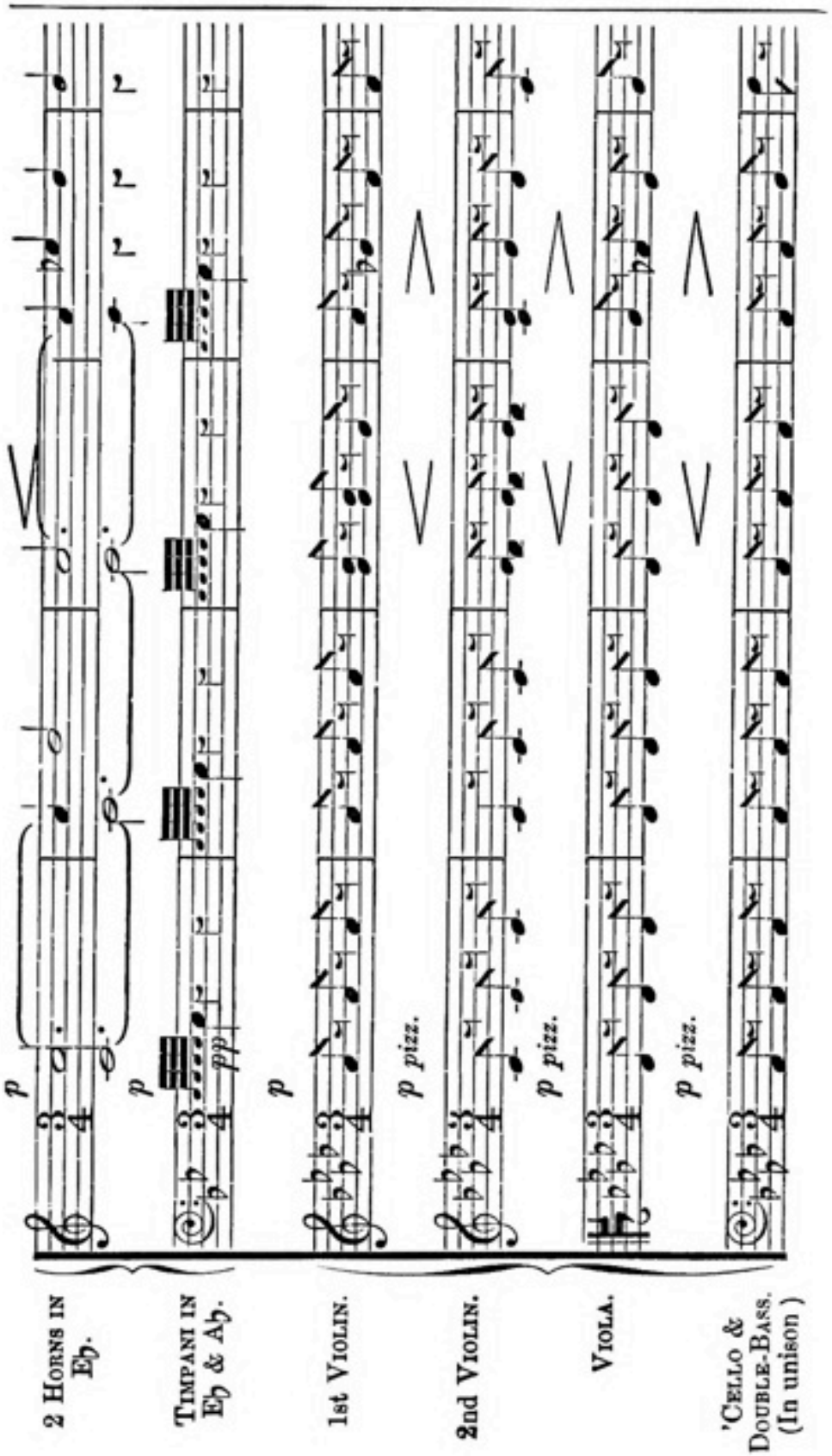
Ex. 51.


Allegretto grazioso.
2 Flutes.
2 Oboes.
2 Clarinets in B♭.
2 Bassoons.
2 Horns in E♭.
Timpani in E♭.
p
mf
tr...


1st Violin.
2nd Violin.
Viola.
Violoncello.
Double-Bass.
mf
p
Unison.

Ex. 62. *Andante.*




2 Horns in Eb.
Timpani in Eb & Ab.
1st Violin.
2nd Violin.
Viola.
'Cello & Double-Bass. (In unison)
p
pp
p pizz.

We will now analyse the fragment contained in the first example, pp. 90 and 91.

The subject is given out by the *strings* in pure four-part harmony; the two *clarinets* and two *bassoons* reproduce the identical notes of the *strings*, thereby filling two important offices: *firstly*, the enriching of the tone of the strings; and, *secondly*, assisting in the enforcement of the four-part character of the movement. So much for the solid structure of this four-bar phrase. Now as to the ornamentation or further colouring. In the first strain the 1*st flute* reproduces the notes of the 1*st violins* an octave higher, thus increasing the sweetness of the melodic effect, and adding interest to the idea. In the second strain the 1*st oboe* takes up the duty of the *flute*, thereby giving variety to the sound, and at the same time continuing the idea commenced by the *flute*, and still without in the least degree interfering with the character of the motives. Gentle harmonies are added by the two *horns*, and a suggestive emphasis by the *drums*.

The second example (pp. 92 & 93) is another specimen of orchestration, in which repose may be said to be the main characteristic.

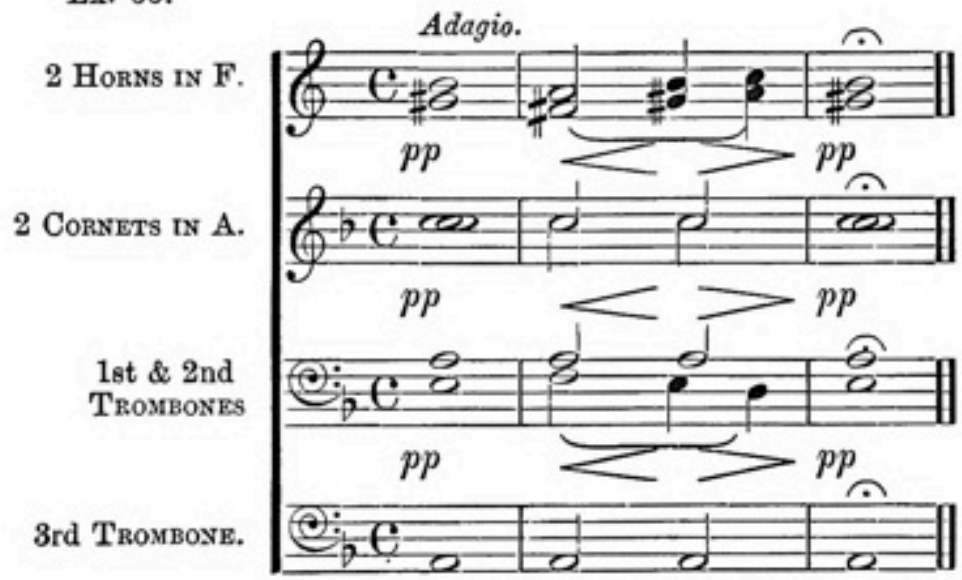
In this illustration we find the following characteristics. A tranquil melody, played on some of the *wind-instruments*, and accompanied by the *strings* with *pizzicato*, is the main feature; but this is not all. The melody given out by the *flute*, the *oboe*, and the *bassoon*, thus spreading over two octaves, is of a peculiarly peaceful and tender character, and calls for the most delicate accompaniment. To provide this, and to soften the *pizzicato* of the strings, all the other wind-instruments lend their aid with sustained notes, thus forming long, spread-out chords, as if played on an exquisitely-toned organ. The very slight *drum-part* is added just to accent the first beat in each bar.

In these two fragments of score, it will be seen that not a

single note is wasted; and that wherever two instruments sound the same note, it is intentional, and designed to strengthen or emphasise the particular part of the chord in which such note appears.

All beautiful orchestral effects are the sheer result of the artistic use and combination of the instruments. It is not for a moment to be supposed that the louder and more powerful instruments are to be reserved purely for loud effects. As mere producers of noise, the *brass-instruments* and *drums* are obviously the most potent; but these can be coaxed into the most tender utterances if properly used. Take the following phrase for instance:—

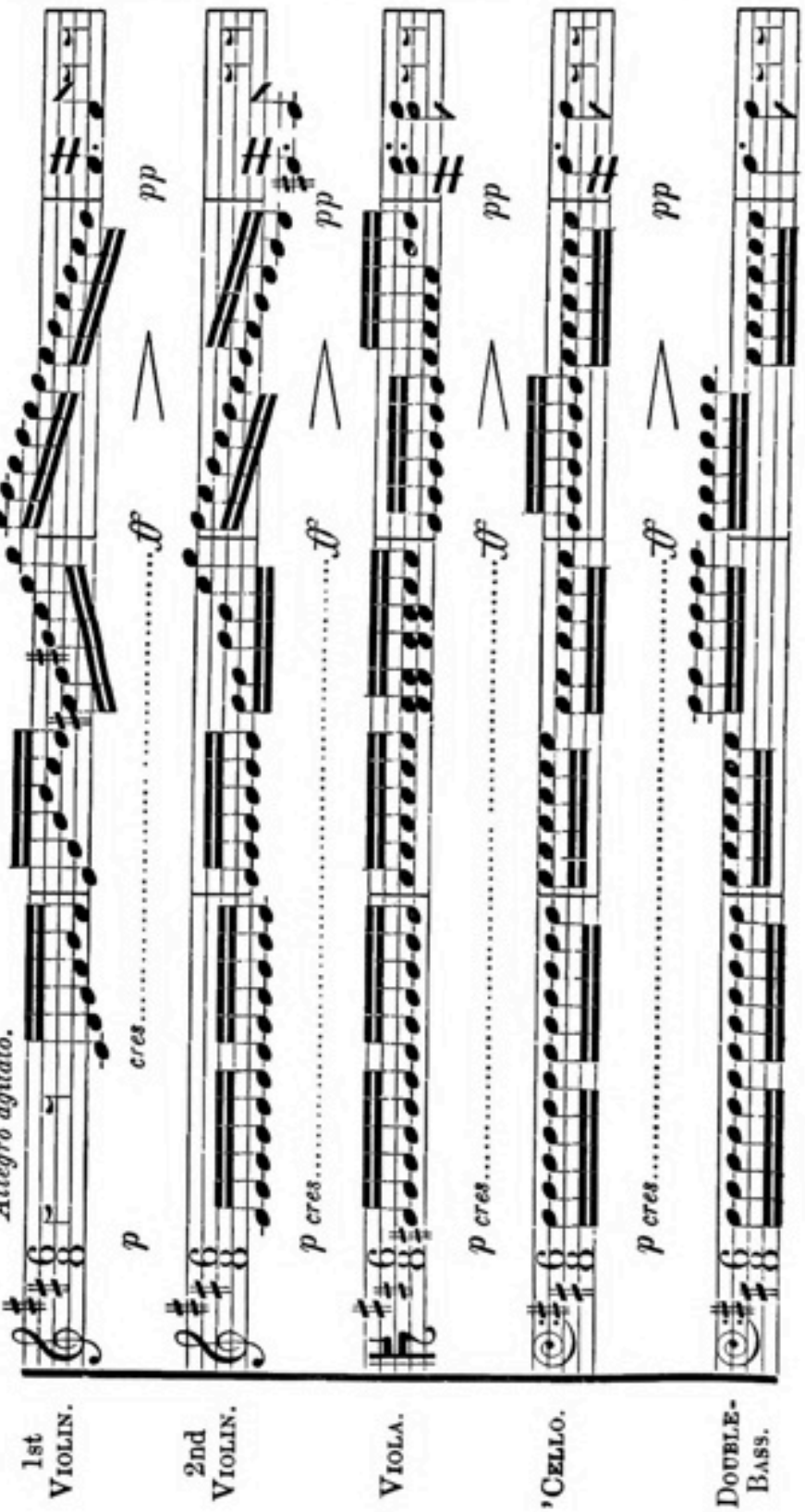
Ex. 53.



in this you realise the minimum of noise, and almost the maximum of expression and significance. While such a passage (p. 96) given to the *strings*, will seem to suggest the rage of a hurricane.

All the strident brass instruments can be wooed to the expression of a "sigh"—a "whisper;" while the strings will, at your bidding, give utterance to the shrieks of frenzy.

Ex. 64.


Allegro agitato.
1st Violin.
2nd Violin.
Viola.
'Cello.
Double-Bass.
p
cres.
ff
pp

It is obviously impossible that in the compass of this small volume I can give lengthy or "full-face" examples of complete orchestration; but as the means of studying orchestral scores, containing thousands of bright and beautiful conceits, infinitely superior to anything that could be expected of my poor pen, are nowadays easily and cheaply attainable, I do not regret that here my illustrations must end.

CHAPTER XVIII.

CONCLUSION.

I BELIEVE that I have now done all in my power to discharge my most interesting and pleasant duty as regards detail. In conclusion, I will offer a few remarks bearing upon a general and extended study of the orchestral art.

In the same manner that you learn more of painting by seeing a painter at work at his easel, than any book can possibly teach you ; so likewise, the way to learn how to write for the orchestra is not only to embrace every possible opportunity of hearing orchestral music, but also to diligently study at home the scores of the best composers. By the "best composers" I do not mean successful musicians of the present day. The symphonies of Beethoven, and more especially the "Eroica," the "Pastoral," the "C minor," and the "Choral," will alone furnish you with useful intellectual nourishment for months at a time. Mozart's symphonies, operas, and masses, are all crowded with the means of orchestral instruction. Haydn's symphonies are also delightful. Of Mendelssohn's orchestral works it is impossible to find too

high an expression of admiration; his music to the "Midsummer's Night Dream" alone being as fine a work as ever was composed by the human brain. And there are almost tons' weight of modern music, works of such as Brahms, Gounod (the most delicate and fanciful of all orchestral writers), the lately discovered giant, Dvorák, and many others. Of the examination of the scores of Wagner I distinctly disapprove, and my reason is that his method, however much the exhibition of colossal talent and superhuman perseverance, has produced scores of imitators, whose works range through all the degrees of imbecility, and not one worthy disciple.

In writing works of your own, be decided, incisive, and brave. At the same time, whatever you write must be influenced by the most sacred purpose and devout reverence for the transcendent beauty of the means at your disposal.

In regard to your study of the scores of others, let me warn you sternly to avoid the fashionable priggishness of attempting to *read the score of a piece at the same time that you are listening to its performance.* If your musical intellect be sufficiently cultured as to enable you to follow the strains of the orchestra, you will have quite enough to do to listen. You need not expect to enhance your enjoyment of a beautiful landscape by consulting at the same time a map of the country or a picture of the view you are gazing at. Listen with all your diligence to the sound of the orchestra, and study the score at home, either before or after the performance, and, better still, both.

And now having placed before you a cursory description of the qualities, characteristics, and judicious uses of the various instruments in the orchestra, will it seem unreasonable if I ask you to regard them as things somewhat above the level of mere mechanical contrivances? Assuredly they are far better than this! A musical instrument is a companion, a consoler, a dear friend, from

whose society you will derive interest, amusement, instruction, infinite and unfailing pleasure, and never by any possibility one particle of evil! It is a means by which, if you duly honour its friendship, you may attain the power of giving pleasure to others, and perhaps of helping to solace the lot of such as are afflicted and suffering.

The information contained in this little book is of necessity scanty, disjointed, and fragmentary; but if the perusal of it by only *one aspiring mind* should have the effect of opening out the contemplation of the orchestra, and bringing after it a desire to explore its beautiful regions, the purpose of the work will be amply fulfilled.

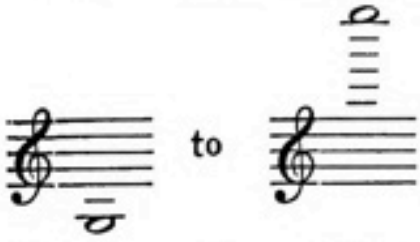
APPENDIX.

Containing details as to the Structure, Compass, and Peculiarities of the various instruments of the Orchestra, by

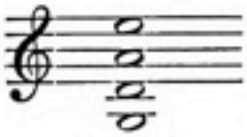
GEO. OAKEY, MUS. BAC., CANTAB.

THE main purpose in the foregoing pages has been to describe the usages of the several instruments, and to convey some idea of those combinations of them which produce the various tone-colours of the orchestral picture. Explanation of the mechanism and technicalities of the different instruments has lain rather outside the purview of the author, who has treated this part of the subject only so far as was necessary to elucidate the particular points that he wished to bring under the notice of the artist-student. The remark in the concluding paragraph as to the information being of necessity scanty, disjointed, and fragmentary, especially applies to the details of the compass, structure, and peculiarities of the various instruments. It has been represented to the present writer that an appendix which supplied this lack so that ready reference could be made within the same cover to the full particulars of the scope and adaptability of an instrument would enable the reader the better to appreciate the practicability or impracticability of any passage that might be written for it. With the idea of thus increasing the usefulness of the book the following pages are added.

STRINGED INSTRUMENTS.

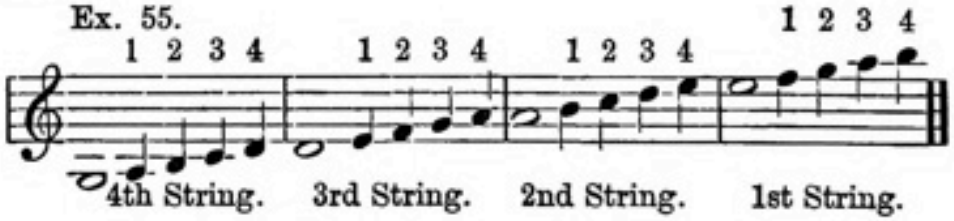
THE VIOLIN.—Its extreme compass ranges from  But the highest notes are very rare, and occur mostly in solo passages. In orchestral music it is seldom that any note is written above 

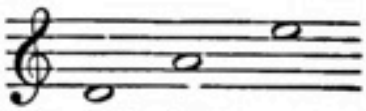
The four strings of the instrument are tuned in fifths to the notes of the following pitch—



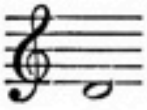
The intermediate scale notes are obtained by pressing the fingers on the strings at various distances. All notes produced by such means are termed *stopped* notes, as those produced from the four strings unstopped are termed *open* notes. In what is termed the first position of the hand, that in which it is placed on the finger-board close to the nut, the stopped notes produced by the different fingers on the four strings are as indicated by the crotchets in the following example, the semibreve representing the open note.

Ex. 55.

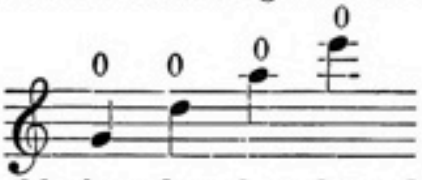


Here it will be seen that the notes  are not only to be produced as open notes of their respective strings but as stopped notes of the respective strings below them. Further examination of the order of notes

in Ex. 55 will also show that there must be some difference in the positions of the fingers on the different strings to produce the notes there written. The positions of the fingers would be the same for the third and second strings, but for the fourth and first strings would be different from either. The same positions of the fingers that produce the notes on the fourth string would, if repeated on the third string, give F♯ for F♮, and the lower octave scale of G would be produced. Similarly if the same finger positions were repeated on the second string C♯ and the middle octave scale of D would be produced; and again, if the same finger positions were repeated on the first string F♯ and G♯ and the middle octave scale of A would be produced. By change of finger position all semitones can be produced, and thus all scales are practicable. While, however, diatonic scales are easy of execution the chromatic scales are somewhat difficult, and to some extent ineffective. By shifts of the hand toward the bridge the compass of each string may be extended to as much as two octaves. This will reveal the fact to the student that there are other notes than the open notes of the D, A, and E strings that may be produced in two and even three ways. He must, too, bear in mind that each string has its own peculiar character and quality. Especially is the fourth string—covered with spun wire, and sometimes called the silver string—different from the others, and it is sometimes made use of for an entire passage for its own effect.

Reference to the positions of the notes on the four strings in Ex. 55 will enable the student to fully understand the practicability, difficulty, or impracticability of the combinations of notes in Exs. 3, 4, and 5. It may be as well to add that any two notes within an octave and within the range covered by the first position of the four strings are practicable except those lying below 

Any interval more than an octave is also practicable if the lower of the two notes is that of one of the open strings G, D, or A. The remarks on p. 31 that "the simplest method of writing for the stringed instruments is always the best, and the fewer notes the better," should show that passages of double stopping for orchestral purposes are the exception and not the rule. In solo playing tones of a light and clear quality are obtained from the natural sounds generated by any open string or tube. These tones are called Harmonics. They are produced by touching the string only instead of pressing it against the finger-board, and are indicated by O placed above the notes required. The most simple and common of the natural harmonic tones give the octave of the four open strings—

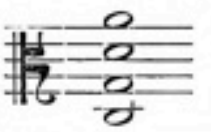


These are occasionally used in orchestral works. There are also artificial harmonics available for solos, though used still more rarely than the natural harmonics. The artificial harmonics are produced by pressing the forefinger upon one portion of the string and touching with the little finger another portion of the string.

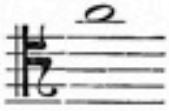
Some differences of effect by mechanical means have been mentioned (on p. 37). It may here be added that when the mutes are to be removed it is indicated by *senza sordini*, and when the *pizzicato* playing—generally indicated *pizz.*—is to be discontinued the words *col arco* are written. Two other devices are also occasionally resorted to for particular effects, viz., playing with the bow quite near the bridge, indicated by the words *sul ponticello*, and playing with the back of the bow, indicated by the words *col legno.*

The Viola.—The ordinary orchestral compass of this instrument extends from its lowest note  to 

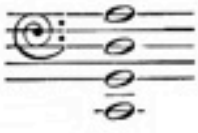
or occasionally a note or two higher. It has four strings, like the violin, but is a larger instrument. Its first string equals the second string of the violin, and its fourth string is a fifth below the fourth string of the violin. Both the third and fourth strings are covered with spun wire. The tuning of the four strings and the open notes, therefore, of the instrument are as follows—



The Viola is sometimes termed the Tenor Violin. The term fairly represents its quality of tone and is appropriate in respect to the part in the string quartet that is usually assigned to it. But the music for the instrument is invariably written on the alto stave, *i.e.*, with the C clef on the third line, except in passages ranging on the higher notes, when to save leger lines the stave with the treble clef is used. The fingerings and the various ways of producing the notes on the violin apply to the viola, considered a fifth lower. All the various effects obtainable on the violin are also available on the viola, though some of them, like the harmonics, are more rarely employed. The violas, on the other hand, are more frequently divided than the violins to gain an additional part to the harmony.

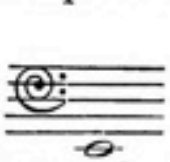
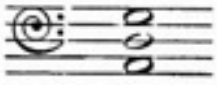
The Violoncello.—The compass of this instrument for orchestral purposes is from  to 

In solo passages the range upwards exceeds this by several notes. The tuning of the 'cello,* as the instrument is popularly named, is similar to that of the viola, but the pitch of the strings is exactly an octave lower, as follows,

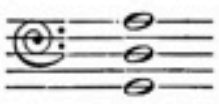


* Pronounced *tchello*.

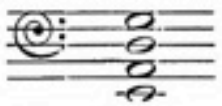
The music for the instrument is mostly written on the bass stave, but when it runs high and several leger lines would be required were it written on the bass stave, the tenor stave is used. In the highest passages of solos the treble stave even is employed. In old scores the G clef was sometimes used, instead of the tenor clef, in immediate succession to the bass clef, and in this case the notes in the treble stave were written an octave higher than the true pitch of the sounds intended. Double notes and chords are far less available than on the violin and viola, and as shown on p. 32 are almost confined to fifths on the open strings. The octave is, however, almost equally easy when the lower note is on an open string. The double note in octave can, then, be obtained on every string but the first.

The Double Bass, or Contrabasso, as it is sometimes called, is the largest of the violin class, and the deepest in tone. Supplying, as has been hinted by the author, the 16 ft. tone and corresponding to the pedal in the organ, it is a most important instrument in the orchestra. The extreme compass of the instrument may be said to lie between  and  the sounds produced being an octave lower than the notation. But the range differs in the lower part of the instrument, as will presently be seen. There are two distinct varieties of the double bass, one with three strings and one with four strings. The three stringed instrument is in England usually tuned in fourths 

But to extend the compass downwards the third string is sometimes tuned down to G, and in France and Italy the first string is tuned a fifth to the second, so that the three strings are then in relation of fifths to each other, thus—

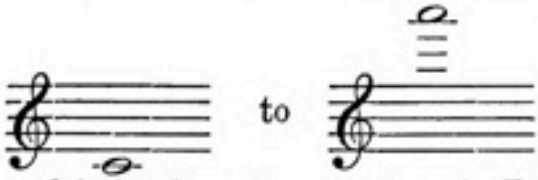


The four-stringed instrument, said to have been originally introduced in Germany; extends the compass down to E, and the tuning is in fourths, thus—



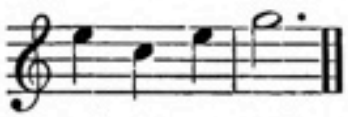
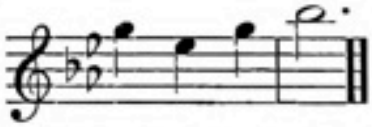
The music for the instrument is written on the bass stave. Generally one line serves for the 'cello and the double bass, the latter instrument, of course, producing the sounds an octave below those of the 'cello. When, however, the part for this instrument goes below E the double bass will play in actual unison with the 'cello. The adapted phrases are often indicated on the one stave by turning the stems of the notes upwards for the 'cello and downwards for the double bass where the parts *appear* to cross. On account of the great length of the strings and the consequent difference in the fingering from all the other instruments of the class all rapid and florid passages easy of execution for the 'cello have to be simplified for the double bass. In this case the parts for the two instruments are often written on two separate staves. Whenever the parts for the two instruments are written on one stave and it is desired that the double basses shall be silent the fact is indicated by the word 'Celli, or by the plan mentioned on p. 85, and when the double basses are again to be united with the 'cellos it is indicated by the term Tutti or Bassi.

THE WOOD-WIND.

THE FLUTE.—The compass of the concert flute, or flute in C, as the author describes it on p. 40, is from  including all the intermediate semitones. The instrument is sometimes called the Great Flute, and it is often described as in D because D is the normal scale produced by uncovering in succession the six holes in the tube.

THE PICCOLO.—The compass of this instrument has been already described, and the fact has been mentioned that the sounds produced are an octave higher than the written notes. It should be added that on this account the instrument belongs to the class termed "transposing instruments," *i.e.*, one which produces different sounds from the written notes, as does the double bass already noticed.

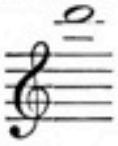
THE TIERCE FLUTE is another variety that finds occasional use in the orchestra, though mostly met with in military bands. It has the same compass as the ordinary flute but the sounds produced are a minor third above the written notes and it is, therefore, a transposing instrument. The following, for instance,

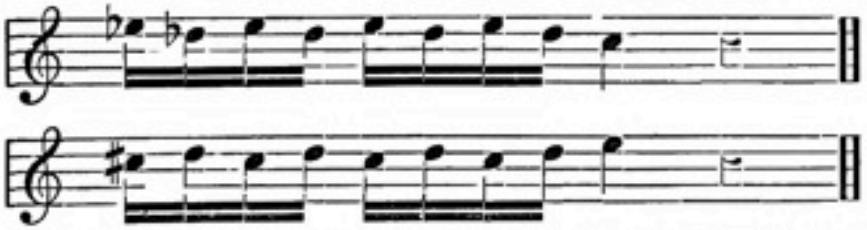
 would sound 

The instrument is generally termed Flute in E♭, but as the ordinary flute has D for its normal scale and this Third Flute has its normal scale a minor third higher it is sometimes, though incorrectly described as the Third Flute in F.

PICCOLO IN D♭ is yet another variety that, formerly used exclusively in military bands, has come to be used occasionally in the orchestra. The sounds produced are a minor ninth higher than the written notes, and the composer

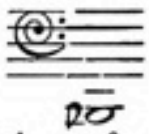
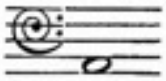
must, therefore, write a minor ninth lower than the notes he requires. For a similar reason to that mentioned in the description of the former-named instrument this Piccolo in D♭ is sometimes, as in Schumann's score of the *Paradise and the Peri*, called a "Piccolo in E♭," or a small flute in E♭. The instrument is principally of use where a movement in a key with many flats would be too difficult for the ordinary piccolo.

The Oboe or Hautbois is an instrument whose tone, already fully described, is produced by means of a double reed. The ordinary compass extends from  to  though occasionally the upward range extends to a note or two higher. The two lowest notes also are seldom written, the C♯ especially being somewhat difficult. The notes A♭ and G♯ in the first octave are also difficult in rapid passages if alternated with the notes immediately above or below them. Similarly the alternation of D♭ and E♭, or C♯ and D♯ in the second octave is difficult in phrases like



Even the B♭ in the first octave in alternation with the C above is difficult in any rapid passage. The best keys for the instrument are those which have not more than three flats or three sharps in the signature.

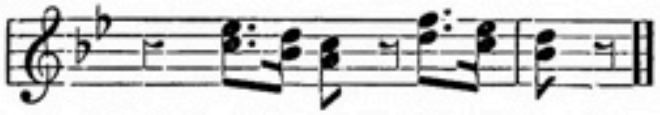
The Corno Inglese.—The compass of this (transposing) instrument is, according to the written notes from  to  but according to the sounds produced, from  to 

The Bassoon, or Fagotto, is an instrument whose tone, like the Oboe, of which it may be considered to be the bass, is produced by a double reed. It is said on p. 51 to have a range of about four octaves, but for orchestral purposes the compass does not exceed three octaves from its lowest note  The Bassoon gives the consecutive harmonics of an open pipe and the real fundamental scale ends with  The notes below this are produced by mechanical means and are rarely used except in slow passages. The best keys for the instrument are, as in the oboe, those with not more than three flats or three sharps in the signature. In other keys rapid passages must be avoided. Where the music runs high it is written in the tenor stave. The tone of the instrument in its upper register resembles to some extent the tenor voice.

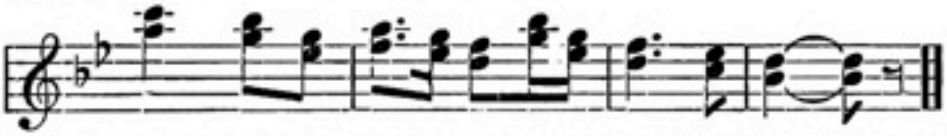
The Contra Fagotto, or Double Bass Bassoon, is, as its name implies, an octave in pitch below the ordinary bassoon. Its extreme compass covers three octaves, but the range upwards for ordinary orchestral purposes does not extend beyond the fifth of the third octave. In notation this compass will be represented as from  to  But the sounds produced will, as in the Double Bass, be an octave lower.

The Clarinet.—The tone of this instrument, unlike the oboe and bassoon, is produced by a single reed. The ordinary compass extends from  to  but solo passages often run a few notes higher. Of the

three varieties of the instrument named on p. 50, only that in C produces the sounds as written. The other two are "transposing instruments." On the B♭ clarinet the sounds produced are a tone lower than the written notes. The notation for this instrument is, therefore, a tone higher than the music. This may be seen in Ex. 24, where the clarinet parts are written in C and the effect produced is

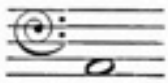
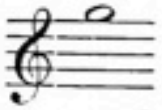
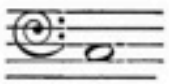


Again, on the A clarinet the sounds produced are a minor third lower than the written notes, and the notation for this instrument is, therefore, a minor third higher than the music. The passage of Ex. 20, for instance, would be written for an A clarinet thus—

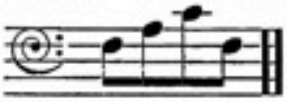


The prime reason for the use of three clarinets of different pitch is to provide for all the scales and to avoid the difficulties that belong to the instrument in scales that are at all distantly related to its own normal scale. Except in the extreme keys it is always possible by the selection of the suitable instrument to avoid a key that will involve more than two flats or two sharps in the signature. On this consideration alone the clarinet in B♭ would be chosen for music in its own key and for all those keys having more flats in the signature; the clarinet in A would be chosen for music in its own key, for the key in two sharps, and for all those keys having more sharps in the signature; and the clarinet in C for music in its own key and for the keys having only one sharp or one flat in the signature. But there is another point to consider, viz., that each clarinet has its own distinctive quality of tone. It has already been mentioned by the author (p. 50) that

the clarinet in C is very rarely used, and this is because it is, in some portions of its register especially, somewhat hard in tone. The clarinet in A is much richer, and that in B♭, which the author has referred to as often preferred by first-class players throughout an entire work, is the richest and most brilliant in tone. It will be seen, then, that while the passage in Ex. 20 could be played on the C clarinet, involving only one sharp in the signature, that, other things being equal, the A clarinet, requiring two flats in the signature as already shown would probably be preferred, while some players and some composers for particular effect would prefer the clarinet in B♭, involving three sharps in the signature.

The Basset-Horn, or, according to its Italian name, Corno di Bassetto, is a clarinet of large size, bearing the same relation to the clarinet in C that the Corno Inglese does to the Oboe. The instrument is sometimes termed the Tenor Clarinet. Its normal key is F. It has been seen that the lowest note of the clarinet in C is  and on the basset-horn, which stands a fifth lower, this would give  By additional keys and a prolonged bore the range downwards is extended to  and the entire compass extends from this to  In notation, however, the compass would be represented as from  to  The music for the instrument is mostly written on the treble stave, in which case the notation is always a fifth higher than the sounds produced. But in the lowest register to avoid leger lines

the bass stave is used. In this case the notes are an octave lower than the proper position, and the sounds produced are a fourth higher than the notation. Thus the

passage written  would sound 

Music for the instrument is rarely written now, and its chief interest lies in the music that has been written for it by Mozart in his *Requiem*, where it replaces the clarinet, and in his operas *Die Zauberflöte*, *Clemenza di Tito*, and *Le Nozze di Figaro*. Mendelssohn is the only other composer of note who has written for the instrument.

The Bass Clarinet is an instrument an octave below the ordinary B♭ clarinet, having a similar compass. The part for the instrument is usually written on the treble stave, in which case the notation is a major ninth higher than the sounds produced. The bass stave is, however, also employed, the notation being then only a tone higher than the sounds produced. The instrument, so rich and effective in its lower register, was formerly confined to the military band, where it is often used instead of the bassoon. Meyerbeer in *Les Hugenots*, Auber in his *Exhibition March*, and Wagner in *Lohengrin* and the *Ring der Nibelungen*, are the chief composers who have introduced the instrument into the orchestra.

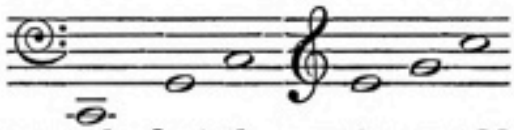
BRASS INSTRUMENTS.

THE HORN.—It has already been said (p. 58) of the natural horn, as it is sometimes designated, that it has neither valves nor pistons. The natural sounds are given in Ex. 30, and the stopped or artificial sounds that are produced with the assistance of the hand are given in Ex. 31. The series of notes in this latter example represents the full resources and the compass according to the pitch of the real sounds produced on the horn in C. But, as may be gathered from the author's subsequent remarks in respect to the highest note it is advisable to write, the notation is an octave higher than the sounds produced. By means of separate pieces of coiled tube, called crooks, the instrument is practically lengthened in the whole extent of its tube and put into other keys. The notation is, however, mostly in the key of C and in the treble stave, the composer indicating at the commencement of the movement what key or keys he wishes the horns to stand in by the words "Corni in E♭," "Corni in G," &c. When a change of crook is required during the course of a movement it is indicated by the words "*Muta* in E♭," &c. The horn in "high C" is little used. In the other keys most usual for the horns the sounds produced when the music is written in the treble stave is as follows:—

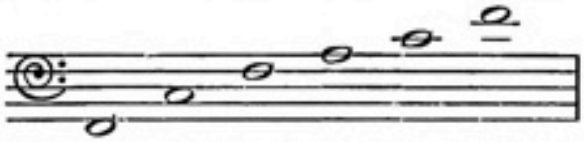
Horn in B♭ (alto) a tone lower than the notation.

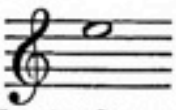
,,	A a minor 3rd	,,	,,
,,	G a perfect 4th	,,	,,
,,	F a perfect 5th	,,	,,
,,	E a minor 6th	,,	,,
,,	E♭ a major 6th	,,	,,
,,	D a minor 7th	,,	,,
,,	C an octave	,,	,,
,,	B♭ (basso) a major 9th	,,	,,

It is possible to get other keys by the use of an intermediate crook, which lowers the pitch of an ordinary crook by a semitone. In this way are obtained Horns in A♭, G♭ (or F♯), D♭, B *basso* (or C♭), and A *basso*.

Though the compass is nominally the same for all horns as that referred to for the horn in C it should be noted that in horns of low keys the low notes of the series (Ex. 30) are difficult of production, and in the horns of high keys the higher notes of the series are unavailable. The lowest notes are often written on the bass stave, and in this case, as in the basset-horn, the curious custom prevails of writing the notes an octave lower than their true position. Thus the first six notes of the series in Ex. 30 would be written 

On the C horn, as already seen, the last three notes would sound an octave lower, but the first three would sound according to the pitch represented. On the F horn, again, the last three notes would sound a 5th lower, and the first three would sound a 4th higher, thus

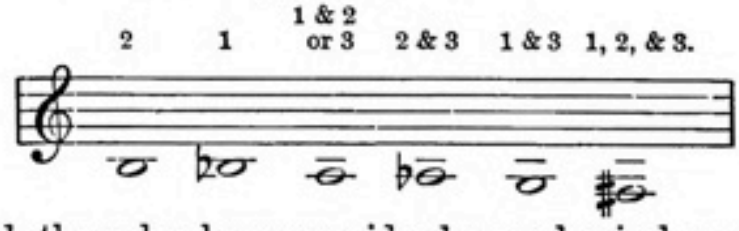


In scoring for two horns they need not necessarily be in the key of the movement, especially if that be an unusual key for the horn, like A♭. In this case a horn in E♭ could be used. Here it may be as well to remark the first horn part should not go below  nor the second horn part above 

When four horns are used it is mostly desirable to have each pair in a different key. If the movement is in the major key one pair will be in the key of the piece and the other may be either in the dominant or sub-dominant key, and if the movement is in the minor one pair will be in

the key of the piece and the other may be in the relative major. Usually, though not always, the third and fourth horns are in the lower rather than in the higher key. Sometimes all four horns stand in different keys. The selection in all cases is made on the principle of obtaining the greatest number of open notes.

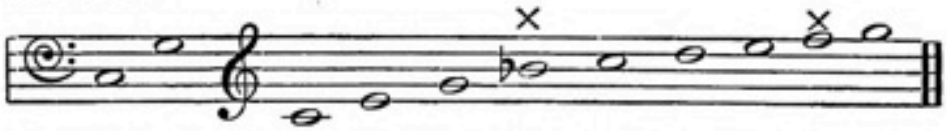
Of the valve or ventil-horn the increasing use of which the author admits but deplores, the mechanism may be briefly described by which all notes are obtained throughout the compass of the instrument without recourse to crooks. The valves or pistons divert the column of air into extra portions of the tube which practically increase it in its entire length, and this of course lowers the pitch. There are three valves in the kind of horn now under notice, but it has been pointed out by Dr. Stone that from the closeness of the harmonics to one another in the part of the scale chiefly used two valves—the first and second—would be sufficient. The first valve depresses the pitch by a tone, the second valve by a semitone, and the third valve by three semitones. In this way all the notes between the open notes of the natural scale of the instrument are provided for, and by the simultaneous use of all three valves the downward range is increased by six semitones. Taking, for instance, the third note of the series in Ex. 30 as it would be written on the treble stave  the same blowing would produce the following series of notes by the use of the pistons indicated by the figures



Though the valve horn provides by mechanical means for all the closed notes of the natural horn these closed notes,

which have their own peculiar effect can still be obtained in the usual way—by the assistance of the hand in the bell—whenever the composer desires them. They are indicated in the score by the words "closed" or "bouchée," or the sign × placed over the note. One advantage in the use of the ventil-horn is that a transposition can be obtained instantaneously, while in the natural horn there must be time allowed to change the crook, and some changes require especial caution, as from a very high to a low key, or from a very low to a high key. Some composers use ventil-horns and natural horns together in one score.

THE TRUMPET (*Ital.* Tromba or Clarino).—The modern instrument—or slide trumpet, as it is sometimes termed—is of brass, mixed metal, or silver, formed of a continuous tube twice turned, forming three lengths and terminating in a bell. The natural notes produced by the mere difference in blowing are the same as for the French horn, but the lowest note and the higher notes of the series are difficult to obtain, especially in the higher keys, and the practical compass for the instrument for the orchestra is as follows :—



The author has already mentioned that the F is not in tune, and that the use of the slide is necessary to bring the note into tune. The student may be reminded that the B♭ is, as in the horn, also out of tune, being too flat, and the use of the slide will correct this inaccuracy. The slide is also used to produce an under semitone to the natural notes and is of special use in the upper part of the register for chromatic passages. The instrument is also furnished with five additional pieces or crooks by which the whole instrument is put into other keys, as in the case of the horn. Before mentioning these keys it should be

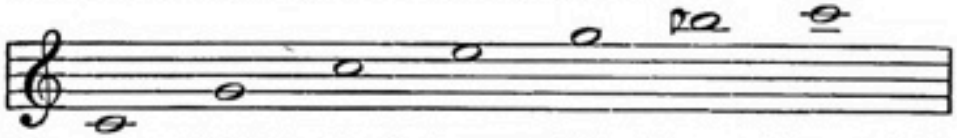
said that music is written for the instrument on the treble stave, and in the open key. On a trumpet in C the notes, say, of those given above as the compass of the instrument, would be produced at the same pitch and not an octave lower as in the horn. In the other most usual keys for the trumpet the sounds produced would be as follows :—

Trumpet in F a perfect 4th higher than the notation.

,,	E a major 3rd	,,	,,
,,	E♭ a minor 3rd	,,	,,
,,	D a major 2nd	,,	,,
,,	B♭ a major 2nd lower	,,	,,
,,	A a minor 3rd lower	,,	,,

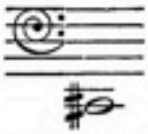
The last named is little used. Two other keys are possible by means of a lengthening piece, viz., D♭ and B, but these keys also are seldom used. If a key is required for which there is no crook in general use, like G, the trumpets will be put into a relative key. Generally only two trumpets are used in the orchestra which are set in the same key. The valve trumpet has the same mechanism as that described for the ventil-horn and possesses the same advantages in obtaining all the extra notes for the chromatic scale throughout the entire compass. But the quality of tone is inferior, and most musicians would prefer the instrument that the author terms the trumpet's successor, which is next to be described.

The Cornet.—The natural sounds produced by the instrument are represented by the notes

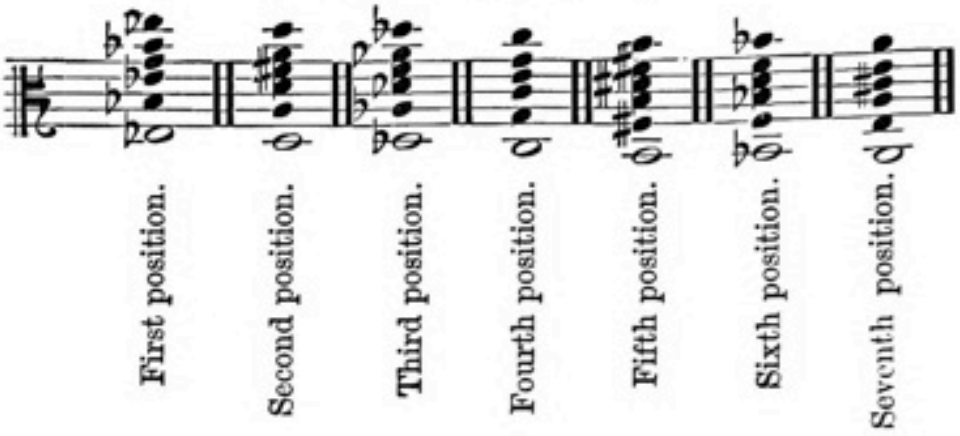


On a cornet in B♭, the instrument that is mostly used in the orchestra, the actual sounds produced would be a tone lower. All the intermediate notes between these are produced by the mechanism of the three pistons with which the instrument is furnished, and the downward compass of the instrument is extended by the same means

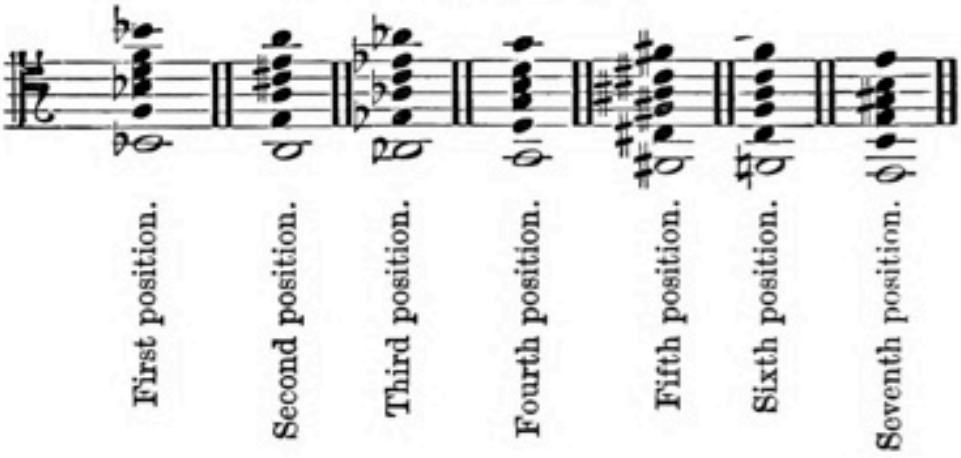
as already fully described for the ventil-horn. The cornet also has crooks which lower the pitch of the entire instrument, the most common being those which put the instrument in A, A♭, and G.

THE TROMBONE.—This has its own natural sounds common to an open tube, the series being similar to those given for the cornet with the exception of the sound written as B♭ which is not available. All the intermediate notes are obtained by means of the slide. By drawing this out the whole tube is lengthened and the instrument depressed in pitch throughout, just as the same effect is accomplished by the mechanism of the valves or pistons in the ventil-horn and cornet. The three varieties of the trombone are named by the author on p. 68. The compass of the alto trombone in E♭ is from  to  That of the tenor trombone in B♭, whose natural pitch is a fourth below the alto instrument, is from  to  The bass trombone is made of various sizes, but that in G is most used, a minor third only below the tenor trombone, and the compass is from  to  The particular means by which these extra sounds are obtained that extend the compass downwards may now be described. The slide is used in seven different positions, the first giving the normal sounds of the instrument. Each of the other positions depresses the pitch by a semitone. The effect of the different positions of the slide on the three instruments may be thus represented.

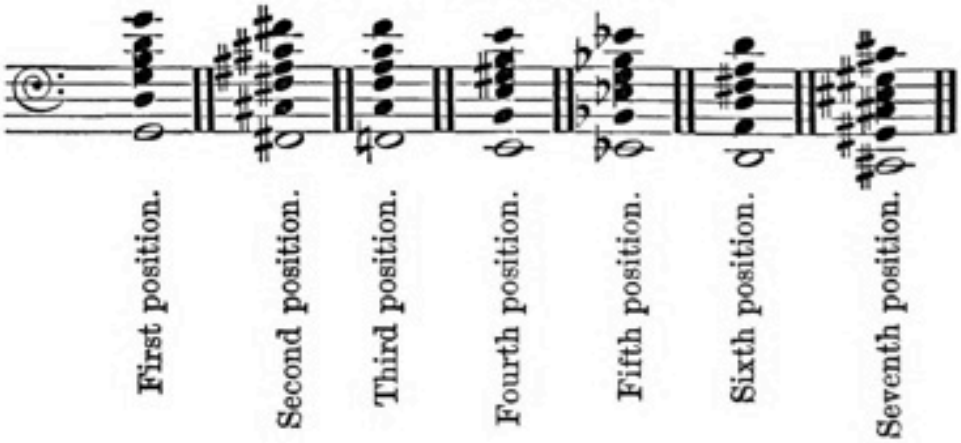
ALTO TROMBONE IN E♭.



TENOR TROMBONE IN B♭.



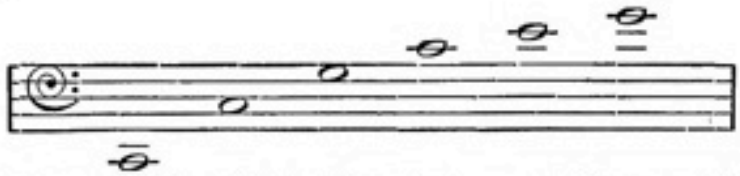
BASS TROMBONE IN G.

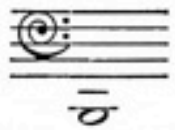


Practically the performer has seven instruments in one at his command, and by a single movement of his slide can pass from one to the other. But it must be remembered that as a certain portion of time is required to shift the tube from one extreme to another, all rapid passages must be avoided which necessitate the alternate changing of extreme positions of the slide, such as would be involved in the following passage for the bass trombone—

It will be seen that the A♭ is, as the equivalent of G♯, obtainable only in the seventh position, while the G is in the first position. The various methods of writing the parts for the different instruments are sufficiently indicated on p. 68. It is only necessary to add that the notation is always according to the key of the movement.

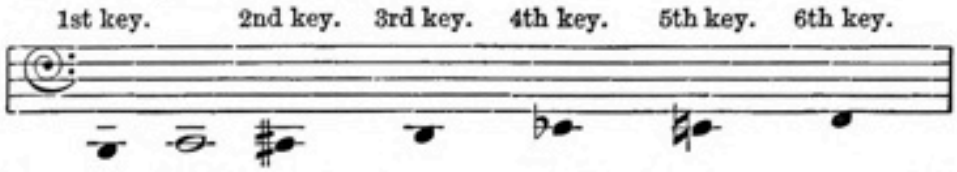
The Ophicleide.—This has the natural sounds of the series common to all brass instruments, which of those available, are as follows for the more common ophicleide in C—



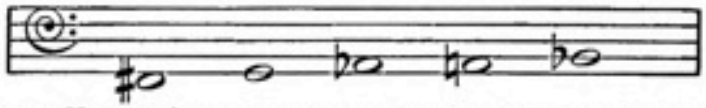
By the keys with which the instrument is provided the compass can be extended from  to 

but for orchestral use the upward range does not exceed the G of the primary series given above. The effect of the use of the different keys is similar to that described for the ventil-horn and trombone. But while in those cases the mechanism depresses the pitch, in this case it raises the normal pitch of the instrument with the sole exception of the first key which lowers it throughout

by a semitone. The several keys of the instrument will alter the pitch as follows

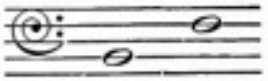
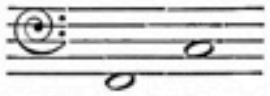


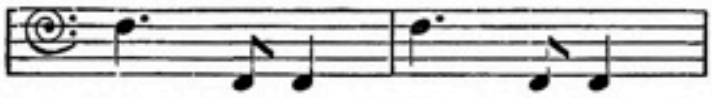
the normal pitch being represented by the open note. All the derivatives of these notes are included according to the series named above. There are also extra keys which produce these respective notes—



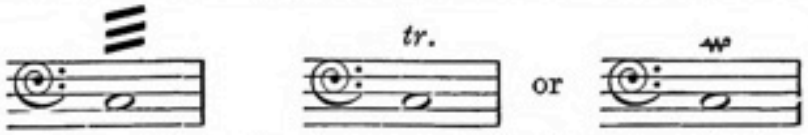
and these allow of a complete chromatic scale in the lower octave. As in the trombone, several of the notes may be produced in different ways, and as a result more accurate intonation is obtainable than in an instrument with three or four valves like the tuba or bombardon and the euphonium, which, as said on p. 70, have taken the place of the ophicleide. The chief objection to the instrument is that its tone is too powerful for general blending with the other brass instruments. Besides the ophicleide in C there is one in B♭, a tone lower. The music for it is, however, usually written according to the key of the movement, as in the case of the trombones. Sometimes the part for the ophicleide is written on the same stave as that used for the trombones.

PERCUSSION INSTRUMENTS.

Drums.—The Kettle-Drums (*Ital.* Timpani) are usually employed in pairs. Each has a compass of a fifth, the smaller drum covering this range  and the larger drum this range  They are most commonly tuned to the tonic and dominant of the key. In the keys of F and B♭ it will be easily seen that the dominant may occupy different positions in relation to the tonic, *i.e.*, either above or below the tonic. In all other keys the tonic and dominant can only be in one relation. In the keys of B, C, C♯, D, E♭, and E the dominant will be below the tonic, and in the keys of A, A♭, G, and F♯ the dominant will be above the tonic. In old scores the part for the drums is written on the bass stave with the notes C and G, whatever the key of the piece, the tuning being indicated by the words "Timpani in G, D," "Timpani in E♭, B♭," &c. It is now the custom to write the notes of the tonic and dominant according to the key, though without accidentals. This latter plan is the more necessary since composers have taken to write other notes than the tonic and dominant. Beethoven has the drums tuned in octaves as in his Eighth and Ninth Symphonies, the passage in the Scherzo of the latter



being a well-known instance. Mendelssohn and others have also for special effects adopted special tunings. Occasionally both drums are used at once, a device first used by Beethoven. Some composers also, notably Auber, Spohr, and Meyerbeer, have written passages that require three drums. The roll of the drum is indicated in notation in either of the following ways—



The Bass Drum has been sufficiently described on pp. 71 and 72. It is not tuned to any particular sound and is used for marked rhythmic effect, mostly in company with the cymbals, one player taking the two instruments. The part is written on the C of the bass stave. If the two instruments are named together thus "Big Drum and Cymbals," "Grosse Caisse et Cymbales," or "Gran Cassa e Piatti," it is understood that the stroke of both is to be coincident.

THE TRIANGLE is another instrument occasionally used in the orchestra to mark the rhythm in movements of a light and airy character. It is usually taken by the performer on the drums, who is generally otherwise unoccupied when the triangle is used. The part is written sometimes on C in the treble stave, sometimes on the G in the fourth space of the bass stave, and sometimes on a single line, thus—