RUDIMENTS OF MUSICAL GRAMMAR.

BY

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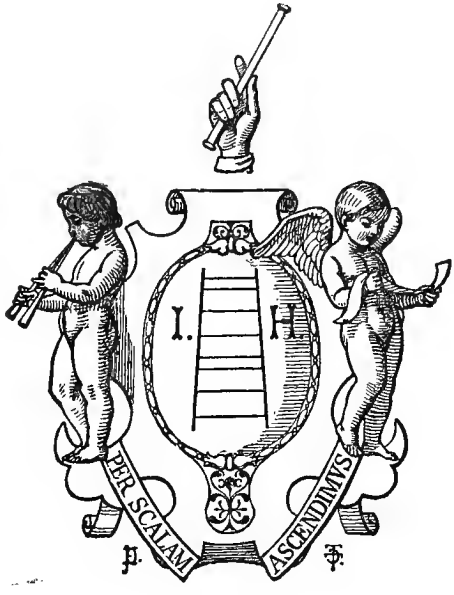
NEW EDITION.



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PREFACE.

THE title of the following work will, it may be hoped, render any explanation of its aims unnecessary. The mode of treatment of the subject, and the order in which the different branches of it are brought before the student, differing essentially from those adopted in most other works of the same kind, require, however, a few prefatory remarks.

We often find the earlier chapters of rudimentary treatises, whether on music or any other subject, occupied, not with attempts to convey ideas of the *things* to be first studied, but with explanations of the *symbols* which represent them,—many of these latter, perhaps, not being called into requisition till an advanced period in the study, when they have to be learned a second time. Thus the beginner in music is made to exhaust the subject of the stave before he is in the least informed as to the nature of the scale; or is called upon to consider the peculiarities of five-crotchet time, while as yet he has no practical acquaintance with the first principles of rhythm. In the following work no attempt is made to introduce the student to the alphabet of music till he has learned something about *music*, or, more properly, the musical *system* itself; nor is he instructed in the different kinds of measure, nor even made aware of the existence of bars, until he has acquired some idea of the limits of a musical *phrase*, and the nature of a musical *foot*,—things altogether independent of any forms by which they may be represented, and which, as they certainly existed ages before the invention of the present musical alphabet, will as

certainly exist ages after that ingenious contrivance has become matter of history, or even of speculation.

The history of an art or science may often be brought to bear practically on the process of teaching it; and the order in which discoveries or improvements have been made will often suggest that in which a knowledge of them may best be communicated. So that the consideration even of exploded theories and obsolete forms may not be without its use, as keys to those which have superseded them. The musical student, for instance, will never appreciate the special merits of modern, unless he have learnt something of ancient, tonality; nor would it be easy to devise any shorter or more simple method of explaining the nature of a *mode*, than through acquaintance with the fact that, though but two modes are used by modern musicians, the number of modes possible is only limited by that of the sounds of the natural scale. This latter fact is briefly alluded to in an early chapter, and more fully treated in a later one the object of which has been rather to excite than to satisfy curiosity on a very interesting branch of musical science.

The chapters on the *Alto and Tenor Staves*—part of a subject treated elsewhere* by the writer more fully—will, it is hoped, be found sufficient to meet the practical wants of the student. The practice of writing alto and tenor parts an octave higher than they are to be sung has no doubt largely superseded the older and more simple one of writing them at their proper pitch. Whether this practice prove permanent or not, the student may rest assured that, unless he make himself familiar with at least two of the four different staves headed by the C clef, a very large proportion of the works of the greatest writers must remain unintelligible to him.

It can hardly be necessary to say, that the following work, though

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* A Short Treatise on the Stave. Longmans & Co.: London.

dealing for the most part with first principles, is not adapted to the use of beginners, save in connexion with musical practice of some kind, under the direction of a teacher. Music is an art as well as a science ; and no art can be learned wholly from books. Nor is it likely that even first principles should ever be so simply stated, or so clearly expounded, as to be intelligible to those who make no attempt to turn them to account. To two classes of persons such a book as this may be of use (1) To those who, having attained some skill in the practice, and acquired some knowledge of the theory of music, may desire to have a connected view of those parts of the latter which are indispensable to the former :—and (2) to those—a very large and increasing class—who, familiar with other subjects, and accomplished in other ways, with little hope of becoming skilled musicians, may still desire to make some acquaintance, if not with the syntax, at least with the orthography, etymology, and prosody of the only grammar which can fairly be called universal. "Were I to begin life again," said the late Sydney Smith, "I would devote much time to music :" and "not six months before the death" of Samuel Johnson, he said to Dr. Burney, "Teach me at least the alphabet of your language." The following pages, it may be hoped, may in some degree enable those who have not had the advantage of early training to devote, with pleasure and profit, some time to music, without "beginning life again," and to acquire something more than the alphabet of the language of musicians.

J. H.

December, 1858.

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RUDIMENTS OF MUSICAL GRAMMAR.

CHAPTER I.

Musical Sound.

1. Sound is the result, or effect on the ear, of motion communicated to the air by some disturbing force. Such motion is called *vibration*, or undulation.

2. When the vibration of air is *regular* (*isochronous*, or equal-timed) the result is *musical* sound; when it is *ir*regular the result is *un*musical sound, or noise.

3. In the regulated production, by voice or instrument, of musical sounds consists the *art* of music; in a knowledge of the laws which govern the succession and combination of musical sounds consists the *science* of music.

4. The art and science of music involve the consideration of *four* properties of musical sounds, their *pitch*, *duration*, *intensity*, and *timbre*.

5. The *pitch* (acuteness or gravity, height or depth) of a musical sound depends on the *number* of vibrations communicated to the air *in a given time*. As this number increases or diminishes so does the sound become more *acute* (higher), or more *grave* (lower).

6. The *duration* of a musical sound depends on the *time* during which the air continues to vibrate *at the same pace*.

7. The *intensity* (loudness or softness) of a musical sound depends on the *extent* of the vibrations by which it is caused.

8. The *timbre* of (quality by which we are enabled to recognise) a musical sound is supposed to depend on the *forms* of the vibrations from which it results.

Timbre (French) literally, *stamp*. No English word has yet been adopted to express the same property of sound.

9. These properties are, for the most part, *relative*. Every sound is assuredly of a *definite* and *appreciable* pitch and duration; but the musical student is chiefly concerned with the pitch or duration of sounds *as compared with one another*—technically, *tune and time*.

The ultimate source of the pleasure afforded by musical sounds is *time*; since *tune* entirely depends on the order, or *regular succession* of the vibrations which affect us as sound. As a matter of practice, however, time and tune must be considered separately,—the latter first.

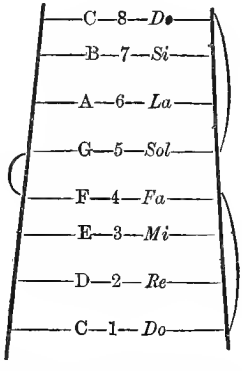
CHAPTER II.

Tune. The Scale.

10. Different sounds (sounds of different *pitch*) produced at the same instant, form *harmony*. *Melody* results from a succession of different, or even a repetition of the same, sounds.

11. Harmony or melody can be produced from the combination or succession of such sounds only as are found in the *same musical system*.

Fig. 1.



12. The basis of the modern musical system is the connexion of a given sound with another, standing in the relation to it of 2 : 1, by means of intermediate sounds also related, though less simply, to that (given) sound and to each other.

13. Such sounds presented in regular succession, form a *scale*, of which the topmast step is the 8th, or *octave*, from the 1st. (*Fig.* 1.)

14. The sounds of that scale which begins on the *central* sound of the modern musical system, are named by *letters* of the alphabet, or by *syllables*, as follows:—

1	2	3	4	5	6	7	8
C	D	E	F	G	A	B	C
Do	*Re*	*Mi*	*Fa*	*Sol*	*La*	*Si*	*Do*

The alphabetical names will be used exclusively in this work.

The student should sing, or play (on a piano-forte or other instrument) the scale of C, until he is thoroughly familiar with the sound of it.

15. With a little attention, even from an uncultivated ear, it will be perceived that the successive steps of this "natural" scale are not all *equal*, and that some adjacent sounds are *less unlike* one another than others; also, that the smaller steps lead to, or immediately precede, places in the scale at which the voice easily *pauses*, and on which the ear is willing to *dwell*. These are the 4th sound, F, and the 8th, C, the sounds immediately *leading* to which, E and B, are severally less unlike F or C than any two other adjacent sounds are to each other.

16. Moreover, further observation will prove that, notwithstanding the difference of *pitch*, the musical effect of C, D, E, F, heard in succession, is strik-

ingly like that of G, A, B, C; in fact, that the *melody* or *tune* of both series is *the same.*

The student should satisfy himself of the truth of this by singing or playing the two series, or any portions of either in immediate succession.

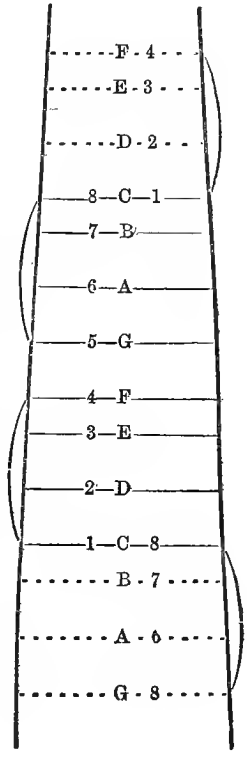
17. The cause of this similarity is to be found in the fact that melody, or tune, does not depend on the absolute, but on the *relative*, pitch of sounds—on their distances apart. F the 4th sound of the natural scale, stands in the same relation to C the 1st, as C the 8th sound, does to G the 5th; while E the 3rd, is to F the 4th, as B the 7th, is to C the 8th.

18. The relation of (difference or distance between) two musical sounds is called an *interval.* The intervals found in passing up or down the natural scale are *tones* and *semitones;* the (two) semitones falling between the 3rd and 4th sounds (E and F), and the 7th and 8th (B and C); the (five) tones falling between *every other two* adjacent sounds. Each *half* of the scale, therefore, consists of *four* sounds separated by *two* tones and *one* semitone.

19. A succession of four sounds separated by two tones and a semitone is called a *tetrachord.* The natural scale, therefore, is divisible into *two* tetrachords, the 1st sound of the *upper* of which (two tetrachords) is separated by a *tone* from the 4th sound of the *lower.*

In fig. 1, the several intervals between the different sounds are expressed by the greater or lesser distances between the lines which represent them. The division into two tetrachords is also shown, and the tone which separates them specially indicated.

Fig. 2.



20. The modern musical system consists in a succession of scales of like construction, the highest or lowest sound of each of which is identical with the lowest or highest of the one immediately above or below it. (*See fig.* 2.) The 8th sound of one scale is therefore the 1st likewise of another, and the 1st of one scale the 8th likewise of another. This similarity in the conditions of the 1st and 8th sounds of a scale is the cause of their bearing the same names, and, ultimately, of *all* sounds bearing the *same names as their octaves.* For as the upper C of fig. 2 is the octave to the lower C, so the D immediately above the former is the octave to the D immediately above the latter. And so of all the other sounds. Thus by a repeated application of the seven letters, C, D, E, F, G, A, B, to the seven corresponding sounds 1, 2, 3, 4, 5, 6, 7, in each successive scale, names are found for all the sounds of the entire musical system, and would still be found could that system be extended *ad infinitum.*

CHAPTER III.

Time. Rhythm.

21. Time and tune, ultimately so closely connected (Chap. I.), may exist, and are often found, independently. Neither, however, can *alone* give perfect satisfaction to the musical sense, which is incapable of appreciating any prolonged succession of musical sounds the proportionate durations of which are not regulated by some law. The result of this kind of law is *rhythm*.

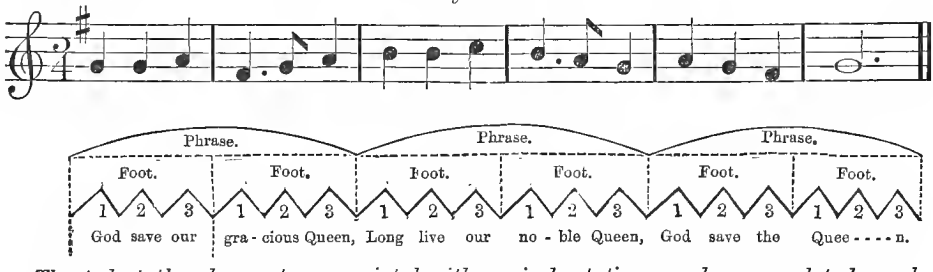
22. Every rhythmical passage or strain of music is divisible into *phrases*—successions of sounds dependent for their meaning on each other, and presenting a certain completeness.

The first strain of the *National Anthem* consists of *three* phrases, each ending in the word "queen." (*See fig.* 3.)

23. Every phrase is further divisible into *feet*, and every foot into *times* or *beats*

Each phrase of the first strain of the *National Anthem* consists of *two* feet, ending severally in the words "our," "queen," "the," &c. (*See fig.* 3.)

Fig. 3.



The student, though as yet unacquainted with musical notation, may be supposed to know, by ear, "The National Anthem." Otherwise, he must take some means of learning it.

24. The times, or beats, of a musical foot are *accented* or *un*accented. A foot consists either of *two* beats, one accented the other unaccented, or of *three* beats, one accented and *two* unaccented.

By the old masters the latter form of foot was held in the highest estimation; a foot of *three* beats being said by them to be in "perfect" time, and a foot of *two* beats in "*im*perfect" time.

The *National Anthem* is in "perfect" time.

25. In the division of musical passages into phrases, of phrases into feet, and of feet into beats, musical rhythm resembles poetical rhythm. Here, however, the resemblance ceases; since while the number of *syllables* into which the *poetical* foot may be divided is very limited, the number of *sounds* into which the *musical* foot may be divided is very great. And not only may any one foot be divided into a vast variety of sounds, but any one *sound* may be prolonged through an entire foot, or through any number of feet.

E.g. The sound sung to the word "queen," in fig. 3, is to be prolonged during an entire foot.

CHAPTER IV.

Notation.

26. The musical alphabet is chiefly composed of characters called *notes*, the relative *positions* of which on a *stave*, or staff, indicate the relative *pitch* of the sounds they represent, and the different *forms* of which indicate their relative *length*.

Fig. 4.

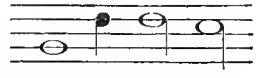


Fig. 4 is a stave, on which are placed four notes, of which the second is *higher* in pitch (and in position) than the first, the third is of the *same* pitch as the second, and the fourth is *lower* in pitch than the third. Moreover, the first is a *longer* note than any of the others, the second a shorter note than any of the others, and the third and fourth are of the same length.

27. But neither the *absolute* pitch of sounds, nor even their *exact* relation to each other in that particular, can be indicated *by notes alone*. A *clef*, or key (to their meaning) is wanted at the beginning of the stave on which they stand.

28. A clef is the *only* character by which a musical sound can be *absolutely* represented.

29. There are *three* clefs, and therefore three sounds only which can be absolutely represented—C, G, and F.

30. The C clef represents the C which occupies the *middle* place in the system of musical sounds,—it having about an equal number of sounds above and below it. It is the C nearest the middle of a piano-forte, called therefore *middle* C. The G clef represents the 5th sound of that scale of which middle C is the 1st; and the F clef the 4th sound of that scale of which middle C is the 8th.

Fig. 5.

C G F

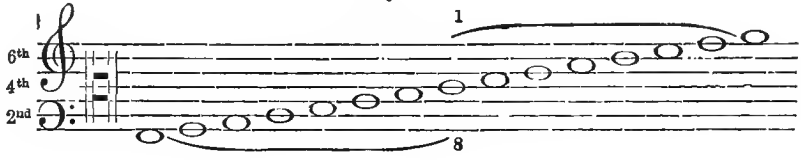
These three clefs are corruptions of old forms of the letters C, G, F.

31. Notes may stand in the *spaces between* the lines of a stave as well as upon them. (*See fig.* 4.) The notes of the *natural scale* occupy *following* lines and spaces of a stave alternately, without exception.

32. The lines and spaces of a stave are called indifferently *degrees*, or positions, and *adjacent* lines and spaces, *following degrees*.

Fig. 6 consists of two successive scales of C. The 1st note of the upper scale is identical with the 8th of the lower. (*Compare par.* 20.)

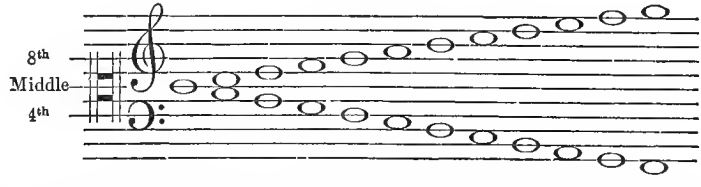
Fig. 6.



33. The note on the 2nd line (from the lowest) of fig. 6 is known as F, because the F clef stands upon it. The note on the 4th line is known as C, and that on the 6th line as G, for a similar reason. Moreover, the notes above and below those designated by the clefs are recognised by their positions *in relation* to the latter; the note in the space immediately below F being E, that in the space immediately above it, G; and so on.

34. When higher or lower notes than those in fig. 6 are to be expressed, *more* lines must be added to the stave. *All* the notes (twenty-three) required for *average* vocal music can be placed on a stave of *eleven* lines, on the *middle* line of which would stand "middle" C—having the same number of notes (eleven) above as below it; and on the 4th and 8th lines F and G.

Fig. 7.



35. No *individual* voice can utter *all* the sounds represented in fig. 7. Consequently, in writing music for individual voices, a smaller number of lines suffices. Practically, whether for vocal or instrumental music, a stave of *five* lines is generally adopted; the *particular sets*, or staves, most used being the five highest and the five lowest of the *Great Stave* above. (*See fig.* 8.)

36. The *lower* one of these sets or *staves* of five lines is used for voices and instruments of low *pitch*. It is distinguished as the *bass* stave. The *upper* stave is used for voices and instruments of higher pitch. It is distinguished as the *treble* stave. 𝄞 is also called the *treble* clef, and 𝄢 the *bass* clef.

Fig. 8.

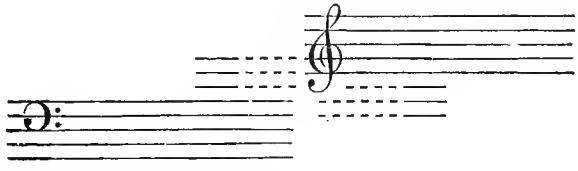
37. The two staves are joined by a *brace*, when used together for *piano-forte* or *harp* music; the upper stave being chiefly devoted to the notes to be played by the *right* hand, the lower to those played by the *left*. (*See fig.* 8.)

38. When the middle line of the Great Stave is required, it is introduced as a *leger* line. (*Compare figs.* 7 *and* 8.)

Léger (French) means *light*.

39. Music for the *lower* voices of women, and the *higher* voices of men, demands other staves which are, equally with the treble and bass staves, extracts from, or parts of, the Great Stave. Of these we shall speak fully, later. For the present, the *treble* and *bass* staves will be used exclusively, such *leger* lines being added to them as may be required. When *more than one* leger line has to be added to the top of the bass stave, it must be considered as an *extract* from the treble stave: *vice versa*, when more than one leger line has to be added to the *bottom* of the treble stave it must be considered as an extract from the bass stave. (*See fig.* 9.)

Fig. 9.

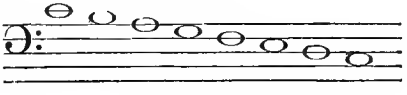


40. The ascending natural scale which begins on *middle* C, will appear on the *treble* stave as in fig. 10. The 1st or *lowest* sound stands on the leger line identical with the middle line of the Great Stave. (*Par.* 38.)

Fig. 10.

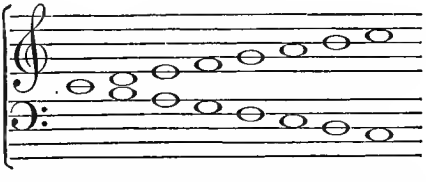
41. The *descending* natural scale which begins on middle C, will appear on the *bass* stave as in fig. 11. The 8th or *highest* sound stands on the leger line identical with the middle line of the Great Stave. (*Par.* 38.)

Fig. 11.



42. By joining together (with a *brace*) the staves on which these two scales are placed, the relation between them will be made plainer. The *lowest* note of the one scale is *identical* with the *highest* of the other, and the leger line on which it stands is common to both staves.

Fig. 12.



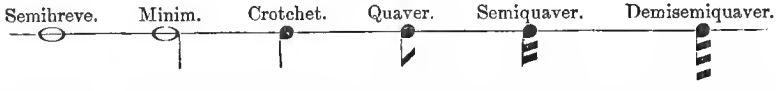
It will have been seen already that the variety of intervals in the natural scale (*Par.* 18) is not made manifest by the ordinary musical alphabet. *To the eye*, the *relation* between E and F is the same as that between G and A. (*See fig.* 12.) There is nothing in the arrangement of the lines of a *stave* analogous to that of the lines of the *ladder* in Chap. I.—reminding us always, by the different distances between them, that E and F, and B and C are severally a *semitone* apart, and that the other sounds which follow one another *scalewise*, are separated by tones. On this fact, however, *depends the modern musical system;* and of all things the student has to learn and to keep in mind, it is incomparably the most important. It will receive further illustration as we proceed.

CHAPTER V.

Forms of Notes.

43. The relative *duration* of sounds is known by the different *forms* of the notes which represent them. The number of these forms, at present in common use, is *six*.

Fig. 13.



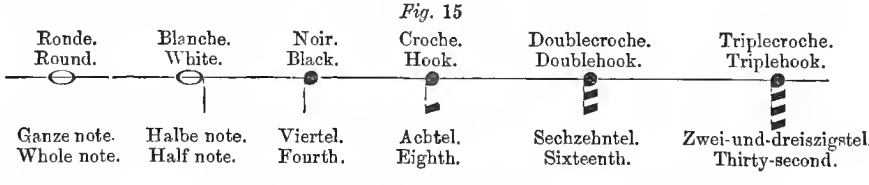
44. These names neither describe the forms, nor even for the most part express the relations, of the notes under them. The two first have been retained from a period when, with three others, they were the only notes in use.

Fig. 14.

45. To these the *crotchet*, originally a *hooked* minim was afterwards added. When the crotchet took its present form the *hook* was transferred to the *quaver*. The *maxim* and *long* are obsolete, and even the *breve* (short note) is now rarely used; while the *minim* (*least* note) is often with us, practically, the *maxim* (*greatest* note).

46. The modern forms are well described by the French names, and their relations one to another by the German.

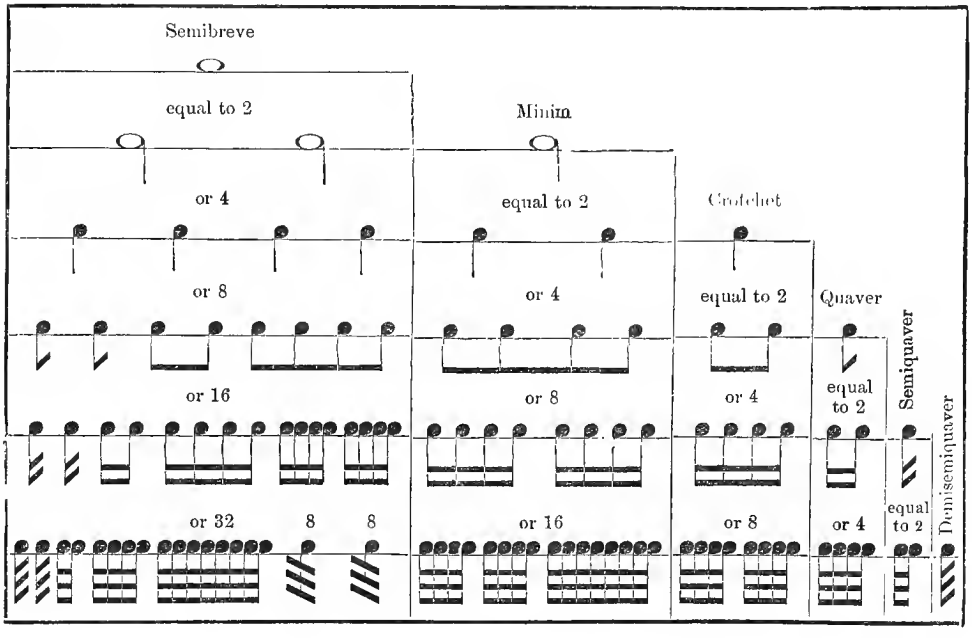
Fig. 15



47. The *stems* of notes may be turned up or down indifferently. The *hooked* notes are frequently grouped and contracted. (*See fig.* 16.)

48. These notes, as respects their length, stand in the most simple relations to each other, each note being *half* the length of the one before it.

Fig. 16.



Exceptions to the rule whereby these notes are proportioned to each other are presented in the occasional compression of more than its proper complement of notes into a single time, or beat. Of these the only instance which need be mentioned here is the *triplet*.

49. A triplet is a group of three notes, which (by licence) is performed in the time of two notes of *the same form*. A triplet is generally specially marked 3.

Fig. 17 (*a*).

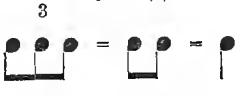
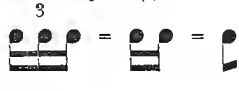
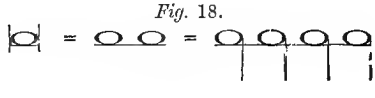


Fig. 17 (*b*).



50. The *brere*, |⊡|, often found in old music, and occasionally in modern, is equal to *two* semibreves, *four* minims, and so on.

Fig. 18.



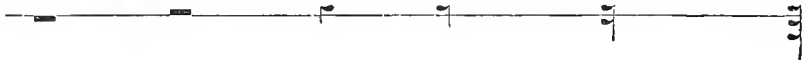
51. *Shorter* notes even than the demisemiquaver—the *semi*demisemiquaver and the *demi-semi*demisemiquaver—have been used in modern instrumental music. In *choral* music even the demisemiquaver is of rare occurrence.

Fig. 19.

52. As musical sounds are represented by *notes*, so are the interruptions, or *cessations*, of musical sound represented by *rests*, the different forms of which indicate the relative duration of such interruptions, or cessations.

Fig. 20.

Semibreve Rest. Minim Rest. Crotchet Rest. Quaver Rest. Semiquaver Rest. Demisemiquaver Rest.



53. The stems of rests are invariably turned down. Rests are never *grouped*.

Another form of crotchet rest is gradually superseding that in fig. 20. It has the advantage of being more readily distinguishable from the quaver rest.

54. These rests indicate, severally, *silence* as long as would be the sound of the notes whose names they bear.

55. The variety afforded by these forms is greatly increased by the use of the *dot* which, being added to a note, or rest, increases its length *one-half*.

Fig. 21.

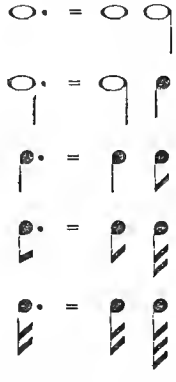
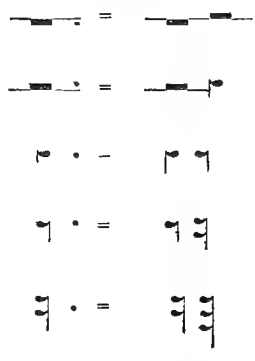


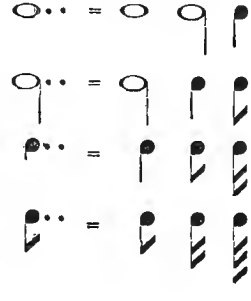
Fig. 22.



The dotted *rest* is little used; the last form in fig. 22 is the more common one.

The dot was called by the old masters "the point of perfection," because it brought the note to which it was added into *perfect* (*i.e.*, triple) time—making it divisible by *three*.

Fig. 23.



56. The *double* dot increases the length of a note by *three-fourths*; the *second* dot standing in the same relation to the *first* as the first to the note it follows.

Thus, a *crotchet* followed by a *double* dot is equal to *seven* semiquavers—the *note* itself being equal to *four*, the *first* dot to two, and the *second* to one. (*Fig.* 23.)

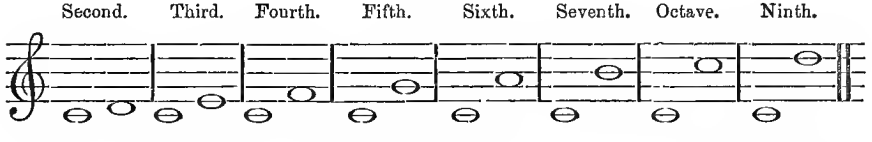
CHAPTER VI.

Intervals.

57. The relation of two sounds in respect to *pitch* is called an *interval*. In passing up or down the natural scale without missing a step (by *degrees*), we meet with no interval greater than a *tone;* but in *skipping* from one sound to another *not* next above or below it, we traverse, or measure, a larger interval. Intervals are named—1st, according to the relative positions of the notes which compose them; 2ndly, according to the number of tones and semitones into which they can be divided.

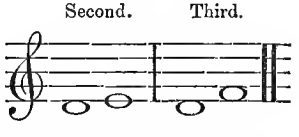
58. For example, D and C are said to be a *second* apart, or D is said to be the second above C because, taking those notes as they appear in the natural scale, D is the 2nd sound from C. And as D is the 2nd above C, so is E the 3rd, F the 4th, G the 5th, A the 6th, B the 7th, C the 8th or octave, D the 9th; and those pairs of notes, severally, are said to form a *second*, a *third*, &c. (*Fig.* 24.)

Fig. 24.



By the same rule, E is the 2nd to D, F the 3rd, &c.; and so with all the other notes.

Fig. 25.

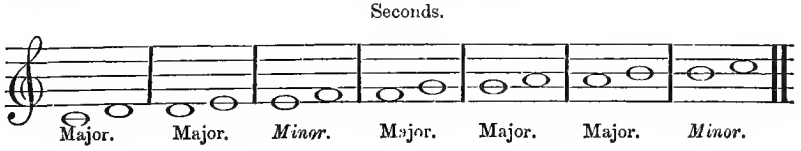


59. But intervals admit of, and require, another and more exact kind of measurement. (*Par.* 57.) E is the 2nd to D, and F the 2nd to E. But it has been shown (*Par.* 18) that E is a *tone* above D, and F only a *semi*tone above E. Therefore the *second* between D and E, must be a second of *different quality* from that between E and F. The two qualities of second are distinguished as *major* (greater) and *minor* (lesser).

60. The natural scale includes *five* major, and *two* minor, seconds; *major* second being but another name for *tone*, and *minor* second but another name for *that kind of semitone* which is found in the natural scale. (*Compare par.* 18.)

There is another kind of semitone, which will be explained hereafter.

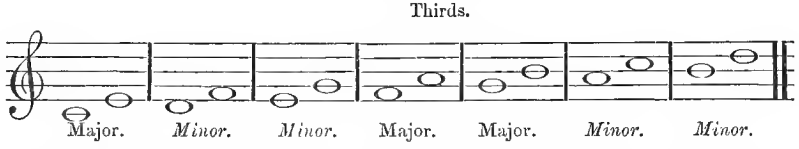
Fig. 26.



61. As there are major and minor *seconds*, so there are major and minor *thirds*. The *major* third is composed of (or divisible into) *two tones*; the *minor* third, of one *tone* and a *semitone*.

62. From C to E there are *two* tones; from D to F, only *one tone* and a *semi*tone. Consequently, C—E form a *major* third, D—F a *minor* third. The natural scale presents examples of *three* major and *four* minor thirds.

Fig. 27.



63. The intervals produced by the *inversion* of seconds and thirds are called *also* major and minor.

64. By the *inversion* of an interval is meant the placing the *lower* note an octave *higher*, or the *higher* note an octave *lower*; thus producing a *different* interval by notes of the *same* name.

65. Two notes a *second* apart form, on inversion, a seventh; two notes a *third* apart form, on inversion, a sixth.

Fig. 28.

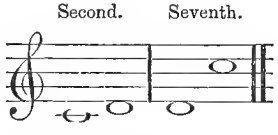
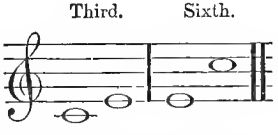


Fig. 29.



66. On inversion, two notes form an interval which is not only different in *kind* but in *quality*. *Major* seconds become *minor* sevenths, and *vice versa*; *major* thirds become *minor* sixths, and *vice versa*.

Fig. 30.

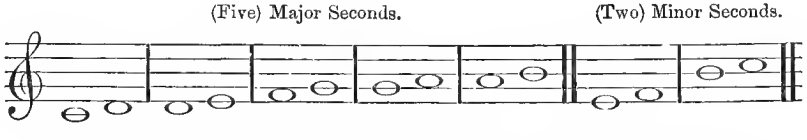


Fig. 31.

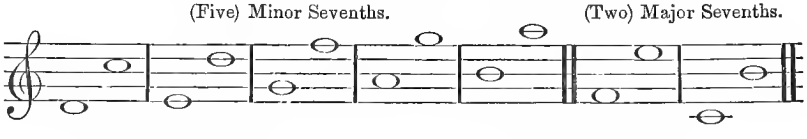
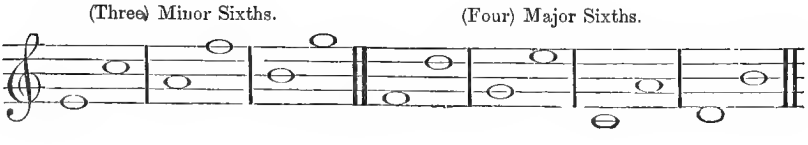


Fig. 32.

Fig. 33.

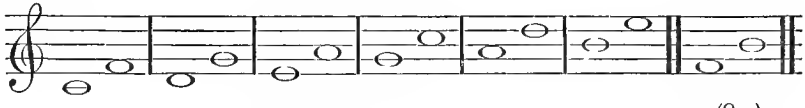


67. The *fourth* and its inversion the *fifth*, together with the *octave* which is the inversion of the *unison*—not properly an interval—are called, for the most part, *perfect*; the only exceptions found in the natural scale being *one plu*perfect fourth and *one im*perfect fifth. The *octave* is, in every case, *perfect*.

68. The *perfect* fourth is composed of *two* tones and a *semi*tone, the *perfect* fifth of *three* tones and a *semi*tone. The (one) *plu*perfect fourth is composed of *three* tones, wherefore it is called also *tritone*; the (one) *im*perfect fifth, of *two* tones and *two* semitones.

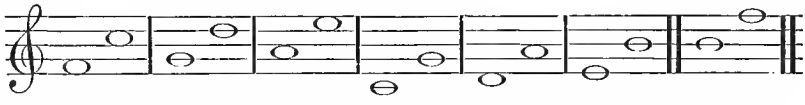
(Six) Perfect Fourths. (One) Plup. Fourth.

Fig. 34.



(Six) Perfect Fifths. (One) Imp. Fifth.

Fig. 35.



69. On inversion perfect intervals *remain* perfect, but *plu*perfect intervals become *im*perfect, and *vice versa*.

70. Intervals *greater* than an octave are generally to be regarded as mere re duplications of those formed by notes of the same name *within* the octave. Thus fig. 36, practically a *tenth*, is still considered as a third; fig. 37, practically an *eleventh*, as a fourth; fig. 38, practically a *twelfth*, as a fifth, and so on.

Fig. 36.

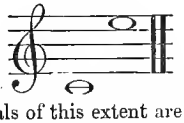


Fig. 37.

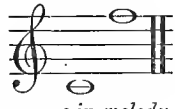
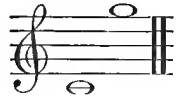


Fig. 38.

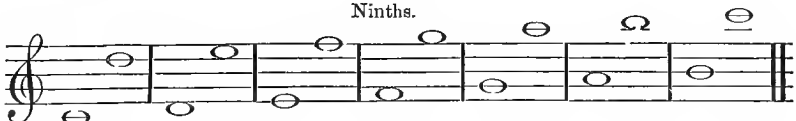


Intervals of this extent are of rare occurrence in *melody*.

71. An exception, however, is presented in the case of the *ninth*, which is not *always* to be regarded as an octave, or *compound*, *second*, but often as a distinct interval. The ninths (like the seconds and sevenths) are called *major* and *minor*.

Ninths.

Fig. 39.



Major. Major. *Minor.* Major. Major. Major. Minor.

72. Intervals greater than an octave do not admit of inversion. The ninth, therefore has no inversion.

The pluperfect fourth and imperfect fifth are less often found in *melody* than the *perfect* intervals of the same kind; whereas the major and minor intervals are used with equal frequency and freedom; presenting no difficulty in execution nor, in ordinary cases, any striking difference in effect.

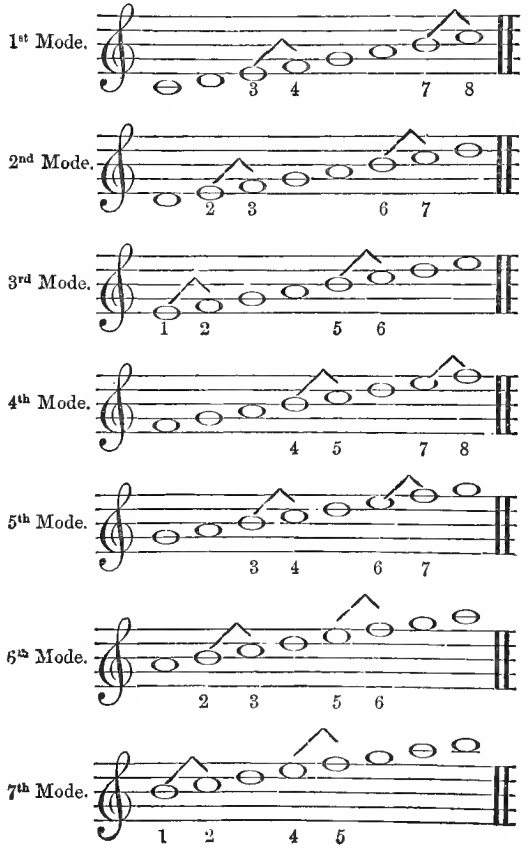
CHAPTER VII.

The Modern Modes.

73. The 1st sound of a scale is called its *tonic, key note,* or *final.* The tonic of the natural scale is C.

74. Any note of the natural scale *may* be used as a tonic; *i.e.*, we may pass, by steps not greater than tones, or smaller than semitones, from any note to its octave. But in the scales up which we shall pass, in so doing, the tones and semitones will fall always *in different places;* so that we shall find as many *different kinds* of scale, in respect to the succession of tones and semitones, as tonics, viz., *seven.* (*Fig.* 40.)

Fig. 40.



75. In these seven scales the semitones fall as follows:—

In the 1st, between the 3rd and 4th and the 7th and 8th sounds.
— the 2nd, —— 2nd and 3rd —— 6th and 7th ——
— the 3rd, —— 1st and 2nd —— 5th and 6th ——
— the 4th, —— 4th and 5th —— 7th and 8th ——
— the 5th, —— 3rd and 4th —— 6th and 7th ——
— the 6th, —— 2nd and 3rd —— 5th and 6th ——
— the 7th, —— 1st and 2nd —— 4th and 5th ——

76. The *order* of tones and semitones in a scale is called a *mode*. *Seven* modes, or forms of scale, are therefore possible; and at least that number was once in use. Among modern musicians only *two* modes are used, the 1st and 6th (of fig. 40), and the latter not without occasional modifications which tend to assimilate it to the former.

77. The former of these (modern) modes is called the *major* mode, the latter, the *minor* mode; because the 3rd sound of the one is distant from the 1st *two* tones, or a *major* third; and because the 3rd sound of the other is distant from the 1st only *one* tone and a *semi*tone, or a *minor* third. (*Compare Pars.* 61 *and* 62.)

Fig. 41.

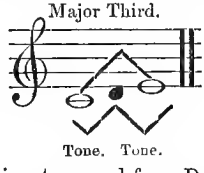
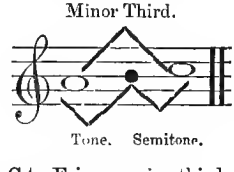


Fig. 42.



From C to D is a tone, and from D to E another; therefore from C to E is a *major* third. From A to B is a tone, and from B to C a *semi*tone; therefore from A to C is a *minor* third.

78. As respects the relation between their 1st and 3rd sounds, *all* the modes are either major or minor; the 1st, 4th, and 5th being *major*, and the 2nd, 3rd, 6th, and 7th being *minor*. The positions of the tones and semitones are however, in some way, different in all the modes; and without some contrivance by which they could be assimilated, only two sounds, C and A, could be used as tonics at all, and the latter only under certain conditions.

79. For, the modern musical system demands that the 7th of a scale be followed by the 8th at the smallest recognised distance; in other words, that the 7th and 8th sounds of an ascending scale be separated by a *semi*tone, the 7th in this case being called the *leading* note; also, that the 4th and 5th sounds form, respectively, a *perfect* fourth and a *perfect* fifth with the tonic.

80. On the first of these conditions, the 2nd, 3rd, 5th, 6th, and 7th modes (of fig. 40) are inadmissible; and on the second, the 4th and 7th. The five former are deficient in *leading notes*, and of the two latter, one (the 4th) has a *plu*perfect fourth, the other (the 7th) an *im*perfect fifth.

The reasons for this rejection of all but the 1st and "under certain conditions," 6th modes, will appear as the student becomes better acquainted with the science of music; the *fact* of their rejection is indisputable. Use is second nature. The modern musician is *used* to the modern system; it is the idiom in which composers have, for at least a century past, expressed their thoughts; and every mode but that of C or A, with the modifications alluded to, is, to the modern ear, if not disagreeable, certainly quaint and unsatisfactory. The modern composer can no more express himself with freedom in the obsolete 2nd, 3rd, 4th, and 5th (the 7th has never been used) modes, than the modern poet in the language of Chaucer. Indeed, it is a question how far music, *professedly* in these modes, was ever *practically* performed, even in the ages when their existence was recognised, without such modifications as must have assimilated them, in most essential particulars, to those with which we are familiar.

CHAPTER VIII.

The Natural Scale.

81. "The 1st sound of a scale," as also the 8th, "is called its *tonic*, *key note*, or *final*." (*Par.* 73.) The 7th sound of the natural scale, and of every scale constructed like it, is called the *leading note*. (*Par.* 79.)

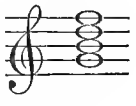
The fitness of these names needs no demonstration. The 1st and 8th sounds are those on which alone a musical passage can be brought to an *end* with perfect satisfaction to the ear; the 7th sound is that which *suggests*, or causes expectation, that the 8th will follow it.

82. Every *other* sound of the natural scale has a like name, *i.e.*, a name due to its position in, and relation to the other sounds of, the scale.

83. The 5th sound of a scale is called the *dominant*, and the 4th the *sub*dominant.

"Dominant" is one of many old musical terms which have altogether lost their original meaning. The dominant is properly the *reciting* note, and therefore the principal, or *governing*, note of the ecclesiastical chant. It is applied by modern musicians to the 5th of a scale, because that sound will bear a combination which, as it can only exist in one scale, *governs*, or decides, it beyond the possibility of doubt.

Fig. 43.



For further explanation of the properties of the dominant, the student is referred to the Author's "Grammar of Musical Harmony," Chap. XVII.

84. The 3rd sound of a scale is called the *mediant*, and the 6th the *sub*mediant. The 2nd is called the *super*tonic.

85. "Mediant" and "submediant" are used in reference to the positions of the 3rd and 6th of a scale, as the inner, or intermediate, sounds of the *triads* of the tonic and of the subdominant.

86. The *triad* to any given note is formed by the addition to it of its 3rd and 5th.

87. E, the 3rd of the scale of C, is the inner or intermediate sound of the triad of C, the tonic (*Fig.* 44); A of the triad of F, the subdominant. (*Fig.* 45.)

Fig. 44.

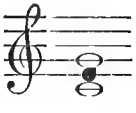


Fig. 45.

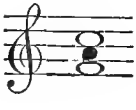
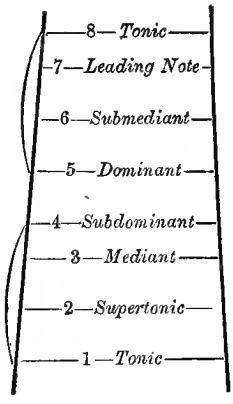


Fig. 46 shows the name which each sound of the scale derives from its position in, and relation to the other sounds of, it.

"A succession of four sounds separated by two tones and a semitone is called a *tetrachord*." (*Par.* 19.)

Fig. 46.



88. The upper of the two tetrachords, into which a scale is divisible (*par.* 19) *begins* on the dominant, and the lower *ends* on the subdominant. The mediant holds the same place *in relation to* the subdominant, as the leading note does to the tonic: and the supertonic holds the same place in relation to the tonic as the submediant does to the dominant.

On this account the submediant is sometimes called the *super-dominant*.

89. As the leading note has a tendency to rise to the tonic (*par.* 79), so the supertonic, the subdominant, and the submediant have each a tendency to rise, or fall, to that note of the *triad* of the tonic which is *nearest* to them: *e. g.* that of the supertonic is to fall to the tonic (*fig.* 47), or to rise to the mediant (*fig.* 48); that of the subdominant to fall to the mediant (*fig.* 49); that of the submediant to fall to the dominant (*fig.* 50).

Fig. 47.

Fig. 48.

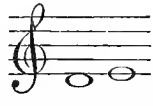


Fig. 49.

Fig. 50.

90. Thus the triad of the tonic (the 1st, 3rd, and 5th of the scale) has an absorbing or attractive force, fully justifying the importance attached to it in the modern system.

91. The progressions treated in par. 89 are all parts of one or other of those *closes* or *cadences* so familiar to the modern musician. They are distinguished as the *perfect* cadence (*fig.* 51 *a and b*) and the *plagal* cadence (*fig.* 52). The former is the more modern and familiar form. Fig. 49 appears in both.

See also the Author's "Grammar of Musical Harmony," Chap. 30. *XXVII.*

Fig. 51 (*a*).

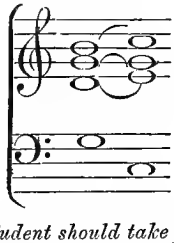


Fig. 51 (*b*).

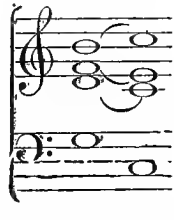
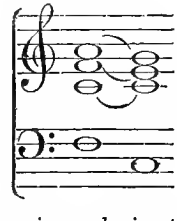


Fig. 52.



The student should take pains to familiarize his ear to these progressions, playing them on the piano-forte, or hearing them played, and, at the same time, singing *first one, then another, of the individual parts.*

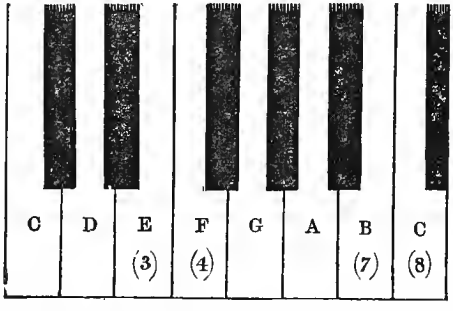
CHAPTER IX.

Altered Notes.

92. Between every two sounds separated by a tone another sound may be placed, whereby the tone is divided into *two semi*tones.

93. On a piano-forte, the natural scale is produced by striking a succession of *white* keys exclusively. Most of these white keys are separated by *black* keys — the intermediate sounds spoken of above; the exceptions being the keys representing E and F and B and C in each octave, which have no black key between them,—those sounds being severally a *semitone* apart, and a semitone being the smallest recognised musical interval. (*See fig.* 53.)

Fig. 53.



94. These intermediate sounds take their names either from the upper or the lower sounds adjacent to them; or, more properly, they are regarded as *elevations* or *depressions* of the latter, and are called such and such notes *sharp* or *flat*, accordingly.

In fig. 54, the *ruled* lines represent the sounds of the natural scale (as in fig. 1), and the *dotted* lines the sounds which divide each tone into two semitones. Each of the latter, it will be seen, has two names, *e.g.*, C *sharp* and D *flat*. Strictly speaking, C sharp and D flat are *not* identical, *i.e.*, it is not mathematically true that they are the same sounds—produced by the same number of vibrations in a second. (*Par.* 5.) For all practical purposes, however, they may be considered as such; as, indeed they are on the piano-forte. (*See fig.* 55.)

Fig. 54.

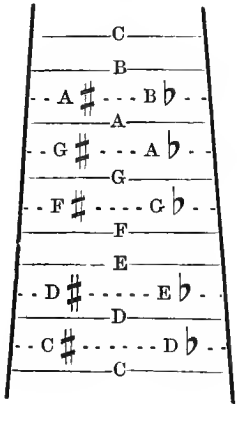
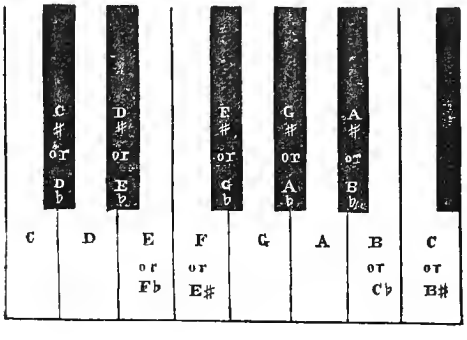


Fig. 55.



95. The depression or elevation of one of the sounds of the natural scale a semitone, or, in other words, the *substitution* of a *flat* or *sharp* sound for a *natural* sound, of the same name, is indicated by placing ♯, called a *sharp*, or ♭, called a *flat*, before the note which represents it.

The substitution of F sharp for F natural, or of B flat for B natural, would be expressed as in figs. 56 and 57.

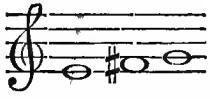
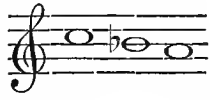
Fig. 56. 

Fig. 57. 

96. A natural note is *specially* indicated by placing ♮, called a *natural*, before the note which represents it.

The substitution of F natural for F sharp, or of B natural for B flat, would be expressed as in figs 58 and 59.

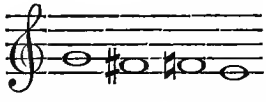
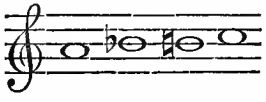
Fig. 58. 

Fig. 59. 

A natural is only called into requisition when it is necessary to *contradict* a foregoing sharp or flat.

97. Sharps, flats, and naturals are placed *before* the notes they alter. We *say* "F sharp, B flat," &c., but *write*, "Sharp F, flat B," &c.

CHAPTER X.

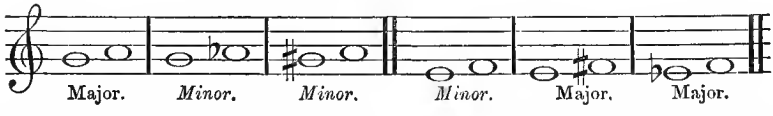
Altered Intervals.

98. By the *alteration* of one of the two notes composing it, the *quality* of an interval may be changed from major to minor, or from perfect to pluperfect or imperfect; and *vice versa.*

99. A *major* second is made *minor* by *flattening* its upper or sharpening its lower note; and a *minor* second is made *major* by *sharpening* its upper, or flattening its lower, note. (*Fig.* 60.)

Fig. 60.

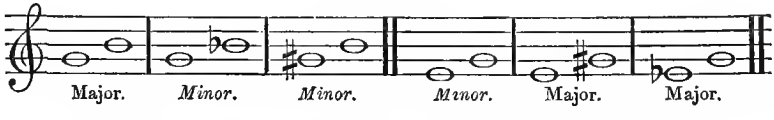
Seconds.



100. A *major third* is made *minor* by flattening its upper, or sharpening its lower, note; and a *minor* third is made major by sharpening its upper, or flattening its lower, note. (*Fig.* 61.)

Fig. 61.

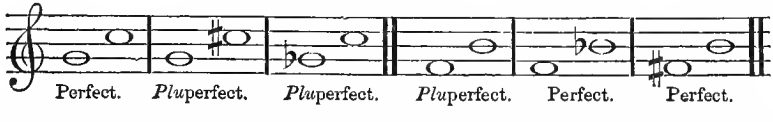
Thirds.



101. A perfect *fourth* is made *plu*perfect by sharpening its upper, or flattening its lower, note; and *vice versa.* (*Fig.* 62.)

Fig. 62.

Fourths.

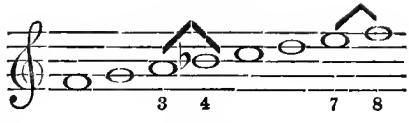


102. So also the *inversions* of these several intervals (the seventh, the sixth, and the fifth) admit of alteration; the two first from major to minor, and the last from perfect to imperfect, and *vice versa.*

CHAPTER XI.

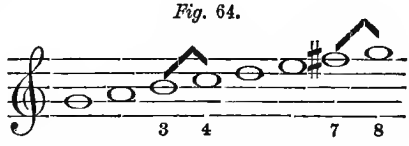
Altered Scales.

Fig. 63.



103. By the *alteration* of *one* note in each, the scales of F and of G may be arranged in the same (major) *mode* as that of C. (*Compare fig.* 40.)

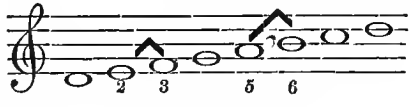
Fig. 64.



From A, the 3rd of the scale of F, to B ♮ would be a *major* second (or *tone*); in flattening B (the 4th) the interval between it and A is reduced to a *minor* second. (*Fig.* 63.)

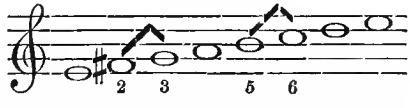
From G (the 8th of the scale of G) to F ♮ would be a *major* second; in sharpening F (the 7th) the interval between it and G (the 8th) is reduced to a *minor* second. (*Fig.* 64.)

Fig. 65.



104. By a similar alteration, the scales of D and E can be arranged in the same (*minor*) mode as that of A. (*Compare fig.* 40.)

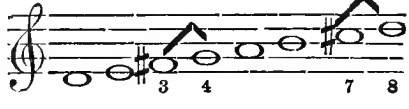
Fig. 66.



From A (the 5th of the scale of D minor) to B ♮ would be a *major* second; in flattening B (the 6th) the interval between it and A (the 5th) is reduced to a *minor* second. (*Fig.* 65.)

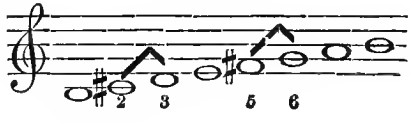
From G (the 3rd of E minor) to F ♮ would be a *major* second; in sharpening F (the 2nd) the interval between it and G (the 3rd) is reduced to a *minor* second. (*Fig.* 66.)

Fig. 67.



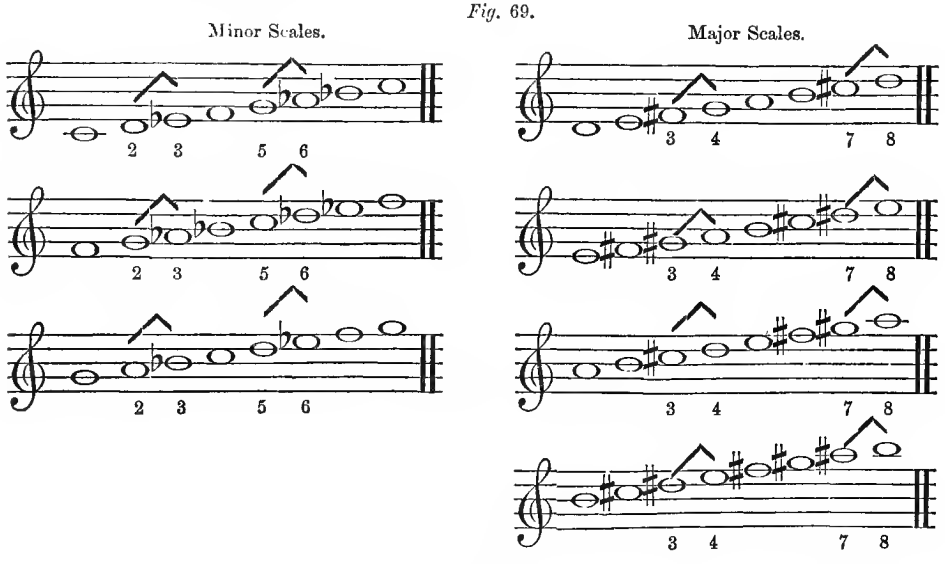
105. The scales of D and of B require, each, *two* alterations to assimilate them, severally, to those of C and of A. (*Compare fig* 40.)

Fig. 68.



106. Moreover, by still further alteration, the three *major* scales in fig. 40 (those of D, F, and G) can be made *minor*, and the four *minor* scales (those of D, E, A, and B) *major*. (*Fig.* 69.)

Fig. 69.



107. In fact, by the alteration of a sufficient number of notes, both a major and a minor scale may be constructed, not only on every one of the *natural* notes, but on every one of the *altered* notes. So that *any* note, natural, sharp, or flat, may be used as a tonic.

CHAPTER XII.

Scales in Actual Use.

"Any note, natural, sharp, or flat, may be used as a tonic." (*Par.* 107.)

108. There are *seven* natural notes, and each of these is alterable *both* by a sharp and by a flat. It follows, therefore, that no fewer than *twenty-one* major, and *twenty-one* minor, scales *could* be expressed in musical characters,—*seven* beginning on *natural* notes, *seven* on *flat* notes, and *seven* on *sharp* notes.

109. It has been shown, however (*Chap. IX.*), that every sound raised by a sharp is, *practically*, identical with the sound a tone above it lowered by a flat; *e.g.*, that C *sharp* is produced by the same piano-forte key as D *flat*, G *sharp* by the same key as A *flat*, &c. (*Fig.* 55.)

110. The number of major and minor scales, therefore, *in actual use* is much smaller than the number possible: it rarely exceeds *twelve*, and never, except transiently, *fifteen*. In only one instance, C, is the same note, made sharp *as well as* flat, used as a tonic; the remaining six notes being used as tonics when made sharp *or* flat,—not both.

111. The *sharp* tonics are C ♯ F ♯.

— *natural* tonics are C, D, E, F, G, A, B.

— *flat* tonics are C ♭, D ♭, E ♭, G ♭, A ♭, B ♭.

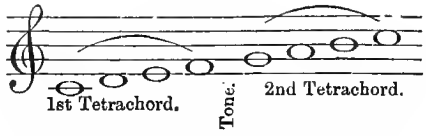
In fig. 70, the series of tonics in actual use is given in musical notation. The notes connected by ⌒ are identical.

Fig. 70.

112. Each of these scales requires for its completion a *different number* of sharps or flats; *e.g.*, the scale of D requires *two* sharps, that of E ♭ *three flats*, &c. Were the number and order of these sharps or flats irregular, or without system, they could only be retained by a very laborious act of memory. Such, however, is not the case. The scales grow out of one another, and add to their number of sharps and flats, according to a simple rule which admits of no exception.

113. "The natural scale is divisible into *two* tetrachords, the 1st sound of the upper of which is separated, by a tone, from the 4th sound of the lower." (*Par.* 19.)

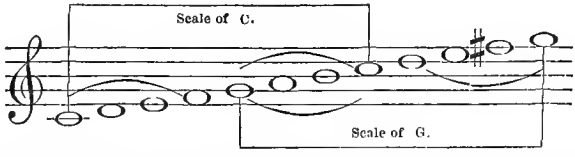
Fig. 71.



114. What is true of the *natural* scale is true of *every* scale constructed like it, *i.e.*, of *every* major scale.

115. If the second (or upper) tetrachord of any one scale be taken as the first (or lower) tetrachord of another, the *new* upper tetrachord added to complete the latter scale will demand a *new sharp*,—*i.e.*, a sharp not found in the scale to which its lower tetrachord is common. (*Fig.* 72.)

Fig. 72.



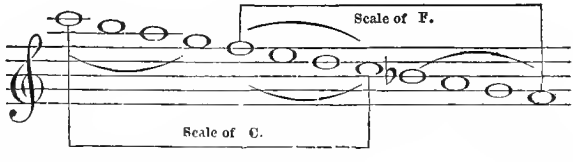
The upper tetrachord of C (*fig.* 72) consists of G, A, B, C. Let these four notes be taken as the *lower* tetrachord of a scale of (*i.e.*, beginning and ending on) G. A new upper tetrachord is required to complete this (new) scale of G, in which the F must be made *sharp*;—otherwise, the semitone will not fall between the 3rd and 4th sounds, but between the 2nd and 3rd; since F *natural* and G are separated by a *tone*, and E and F natural by a *semi*tone. In fact, without the F *sharp*, the scale of G will be imperfect for want of a *leading note*. (*Compare par.* 79.)

This experiment repeated in any other part of the musical system will be attended with a similar result,—the *upper* tetrachord of the *new* scale will, *in every case*, require the introduction of a *new* sharp.

116. A similar process applied in an opposite direction, will be attended by a similar result,—in the production of a series of scales with *flats*.

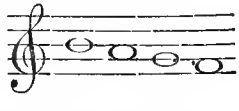
117. If the *first* (or *lower*) tetrachord of any one scale be taken as the *second* (or *upper*) tetrachord of another, the *new lower* tetrachord added to complete the latter scale will demand a *new* flat,—*i.e.*, a flat *not* found in the scale to which its lower tetrachord is common. (*Fig.* 73.)

Fig. 73.



The lower tetrachord of C (*fig.* 73) consists of F, E, D, C. Let these four notes be taken as the *upper* tetrachord of a (descending) scale of F. A new lower tetrachord is required to complete this (new) scale of F, in which the B must be made *flat*; otherwise, the four notes will *not include a semitone* (*fig.* 74), and will, therefore, not form a tetrachord; for a tetrachord is a "succession of four sounds separated by two tones *and a semitone*." (*Par.* 19.)

Fig. 74.



This experiment, again, repeated in any other part of the musical system will be attended with a similar result,—the *lower* tetrachord of the new scale will, in every case, require the introduction of a *new* flat.

118. The second tetrachord of every scale begins a *fifth above* the first; *vice versa*, the first tetrachord of every scale begins a *fifth below* the second. *Sharps*, therefore, are generated in an order of *ascending*, and *flats* in an order of *descending*, fifths. (*See figs.* 75 *and* 76.)

From fig. 75 it will be seen that—

119. In a series of scales, the tonics of which are perfect fifths *above* one another, each scale requires a *sharp* more than the one before it. This additional sharp is always the *leading note*, and consequently always a perfect fifth above the sharp last added to form the preceding scale.

120. The tonics, perfect fifths *above* each other, are,—

C, G, D, A, E, B, F ♯, C ♯.

F *natural* is an *im*perfect fifth above B.

121. Of these scales the *leading notes* (also perfect fifths above each other) are,—

B, F ♯, C ♯, G ♯, D ♯, A ♯, E ♯, B ♯.

From fig. 76 it will be seen that—

122. In a series of scales the tonics of which are perfect fifths *below* each other, each scale requires a *flat* more than the one before it. This additional flat is always the subdominant (4th sound) of the scale, and consequently always a perfect fifth below the flat last added to form the preceding scale.

123. The tonics, perfect fifths *below* each other, are,—

C, F, B ♭, E ♭, A ♭, D ♭, G ♭, C ♭.

B *natural* is an *im*perfect fifth below F.

124. Of these scales the subdominants (also perfect fifths below one another) are,—

F, B ♭, E ♭, A ♭, D ♭, G ♭, C ♭, F ♭.

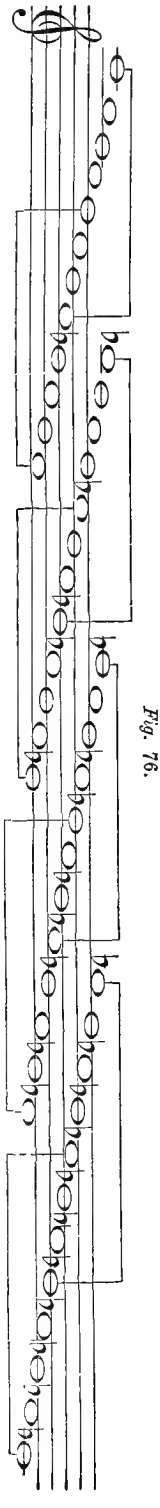


Fig. 76.

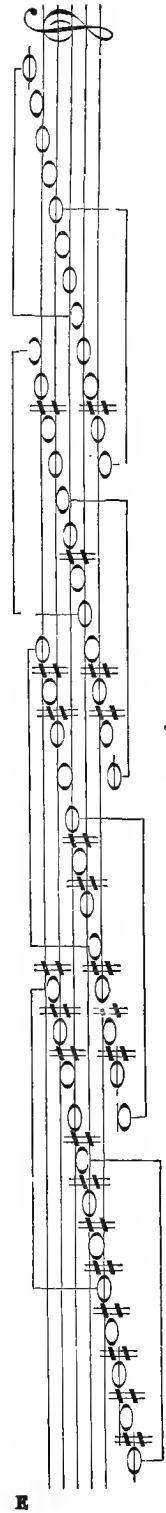


Fig. 75.

CHAPTER XIII.

The Chain, or Circle, of Scales.

125. "Every sound raised by a sharp is practically identical with the sound a tone above it lowered by a flat." (*Par.* 109.)

126. By availing ourselves of this circumstance *once* we may form a *chain*, or circle, of scales, *connected* on the system explained in the last chapter.

127. The perfect fifth above C is G; above G, D; above D, A; above A, E; above E, B; above B, F♯. F♯ is identical with G♭. (*Figs.* 54 *and* 55.) The perfect fifth above G♭ is D♭; above D♭, A♭; above A♭, E♭; above E♭, B♭; above B♭, F; above F, C—the note from which we started, and in returning to which we complete the chain, or circle, of scales. (*Fig.* 77.)

128. A transition like that from F♯ to G♭ is called an *enharmonic* change. The enharmonic change in the above series could be made from B to C♭, or from C♯ to D♭; indeed, it *could* be made, though not so conveniently, in any part of the series.

Enharmonic (from the Greek) is a word having reference to a musical system in which intervals smaller than semitones formed part.

To keep within the limits of the treble stave every alternate note in Figs. 77 and 78 is placed a *fourth below* instead of a fifth above. The fourth is the *inversion* of the fifth. (*See par.* 64.)

Fig. 77.

129. The same process reversed will be attended by the same result.

130. The perfect fifth below C *is* F; below F, B♭; below B♭, E♭; below E♭, A♭; below A♭, D♭; below D♭, G♭. G♭ is identical with F♯. The perfect fifth below F♯ is B; below B, E; below E, A; below A, D; below D, G and below G, C—the note from which we started. (*Fig.* 78.)

Fig. 78.

131. The sharps or flats *essential* to the scale in which a musical composition is said "to be," are not placed before *every individual* note which may require *alteration*, but *together*, at the beginning of each stave. In this collected form they are called the (scale) *signature*.

The signature of every major scale is exhibited in fig. 79, which will further illustrate the contents of the preceding paragraphs. A ♯ is placed a *fourth below* D ♯, instead of a fifth above, to keep within the limits of the treble stave.

132. In the signatures, the *order*, whether of the sharps or flats, is never changed. If there is *one* sharp in a signature, it is F ♯; if there are more sharps than one, F ♯ is always the *first*, C ♯ the *second*, and so on. The same rule holds in respect to the flats.

The note after each signature (in fig. 79) is the tonic indicated by it. Observe that—

133. The last added sharp is always the *leading note*, or 7th of the scale—a minor *second* below the tonic; and that the last added flat is always the *subdominant*, or 4th of the scale—a perfect fifth below the tonic. Therefore—

134. The tonic of the major scale is always to be found a minor *second above* the last added *sharp* of a signature, or a perfect *fourth below* the last added *flat*.

E.g. If the last sharp is D ♯, the tonic is E. If the last flat is A ♭, the tonic is E ♭.

135. The signatures over and under each other (*in fig.* 79) are those of tonics practically identical: viz., B and C ♭, F ♯ and G ♭, C ♯ and D ♭. Without the enharmonic change, the next tonic of the ascending series would be G ♯ —of which the *leading note* would be F *double* sharp; and the next of the descending series, F ♭—of which the *subdominant* would be B *double* flat.

136. A double sharp, formerly written ♯♯, is now commonly abbreviated thus ×. There is no contraction of the double flat, which is expressed thus, ♭♭.

137. A double sharp raises a note, and a double flat lowers a note, *two* semitones. F × is therefore identical with G ♮, and B ♭♭ with A ♮,—*practically*, but not theoretically. (*Compare Chap.* IX.)

138. It it most important, in respect to the theory of scales and intervals, that the distinction *in name* between notes having the same sound be always observed

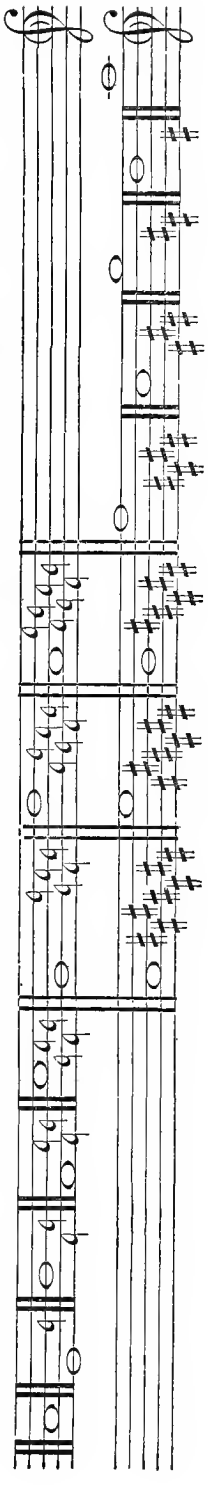


Fig. 79.

139. By substituting G ♮ for F × in the scale of G ♯, or A ♮ for G 𝄫 in the scale of F ♭, we should interrupt the succession essential to a scale, by *omitting* one note, and *repeating* another. (*Compare fig.* 80 *with fig.* 81, *and fig.* 82 *with fig.* 83.)

Fig. 80.

Fig. 82.

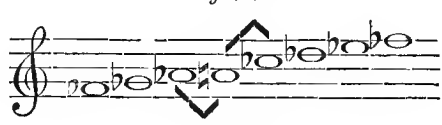
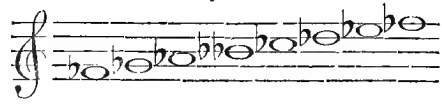


Fig. 81.

Fig. 83.



140. So again, the interval formed by C ♯ and F × is the one pluperfect *fourth* of the scale of G ♯ (*fig.* 84); that formed by C ♯ and G ♮, the one imperfect *fifth* of D (*fig.* 85); while the interval formed by E ♭ and B 𝄫 is the one imperfect *fifth* of the scale of F ♭ (*fig.* 86); that formed by E 𝄫 and A ♮, the one pluperfect *fourth* of B ♭. (*Fig.* 87.)

Fig. 84.

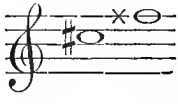


Fig. 85.

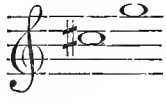


Fig. 86.

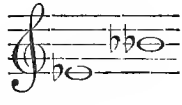
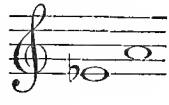


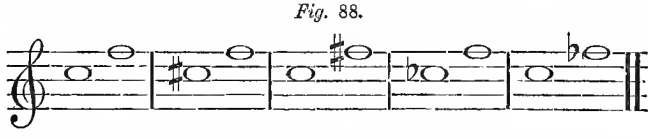
Fig. 87.



141. No *alteration*, by whatever number of sharps or flats, of either of the two notes forming an interval, can change its name and kind—which depend on the number of *positions* of the stave, *not* on the number of tones or semitones, it includes. From C to F is a *fourth*, whether the C or the F be natural, sharp, double sharp, or double flat.

The intervals in Fig. 88 are all fourths, though of different *qualities*—some as yet unexplained.

Fig. 88.



142. Neither the double sharp nor the double flat ever appear in a signature; they are invariably *accidentals*.

143. When the signature is changed, *in the course* of a piece of music, for another of a lesser number of sharps or flats, the places of the latter are sometimes taken by *naturals*, in order that *special attention* may be directed to the change. (*Figs.* 89 *and* 90.) The naturals should never appear but *once* in each part.

Fig. 89.

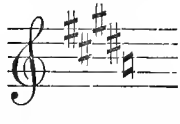


Fig. 90.

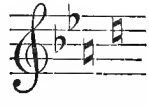


Fig. 89 exhibits a change of signature from B to E; fig 90 from A ♭ to F. The naturals in both instances indicate the former, as well as the present, scale.

CHAPTER XIV.

The Minor Mode.

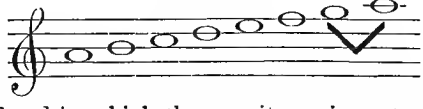
144. "Among modern musicians, only two modes," or forms of scale, "are used," the major and the minor; "and the latter not without occasional modifications which tend to assimilate it to the former." (*Par.* 76.) As the scale of C is the type, or model, of all *major* scales, so is the scale of A the type of all *minor* scales.

145. A minor scale differs from a major scale *chiefly* in the circumstance to which each owes its name;—the 3rd sound of the former is a *minor* third from the 1st, the 3rd sound of the latter, a *major* third from the 1st. (*Compare par.* 77.)

146. This, however, is not the *only* difference between the two modes. A major scale is not liable to change in the quality of its intervals; a minor scale *is*,—its *upper* tetrachord assuming no less than *three* different forms.

147. The natural minor scale (that of A) is deficient in a leading note; the 7th sound being a *tone*, not a semitone, below the 8th. (*Fig.* 91.

Fig. 91.



148. Now, a tetrachord in which the semitone is not the interval *last heard*, leaves no impression of completeness on the ear. The upper tetrachord of the natural minor scale is, to a certain extent, satisfactory *in descending*, because the semitone *is* then the interval *last heard*; but it is very unsatisfactory *in ascending*, because this condition is not then observed. (*Compare figs.* 92 *and* 93.)

Fig. 92.

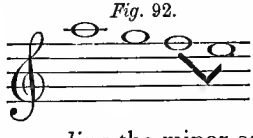
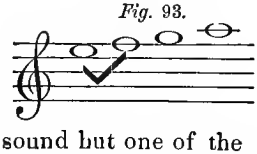


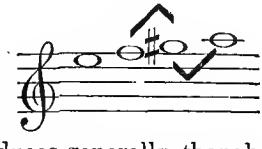
Fig. 93.



149. In *ascending* the minor scale, the last sound but one of the upper tetrachord is usually *raised* a *semitone*, whereby the scale is furnished with a *leading note*.

Fig. 94.

Thus the upper tetrachord of A minor would appear as in fig. 94.

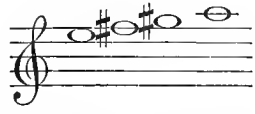


150. This elevation of the 7th sound of the minor scale induces generally, though *not always*, that of the 6th also. For, in diminishing the interval between the 7th and the 8th sounds, that between the 6th and 7th is, of necessity, *augmented* to the same extent.

From F to G♯ is an interval *greater than a tone*, and its introduction renders the upper tetrachord of *La chromatic*. (*See Chap.* 20.) Chromatic intervals are, in modern music especially, by no means forbidden, but their presence essentially alters the character of a passage and, generally, renders it more difficult of execution.

151. In *ascending* the minor scale, the 6th sound, as well as the 7th, is usually raised a semitone, whereby the interval between the two sounds is reduced to a tone.

Fig. 95.



See fig. 95, the common form of the upper tetrachord of *La* minor.

152. Thus the upper tetrachord of a minor scale admits of *three* forms—two diatonic, one chromatic. (1) The *natural* diatonic form, rarely used but in descending (*fig.* 96); (2) the *altered* diatonic form, used in ascending (*fig.* 97); (3) the *chromatic* form, used both in ascending and descending (*fig.* 98).

Fig. 96.

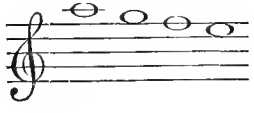


Fig. 97.

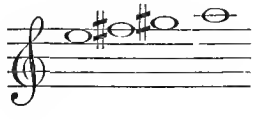
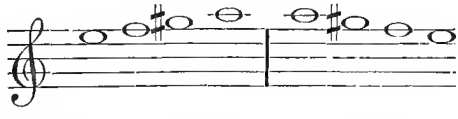


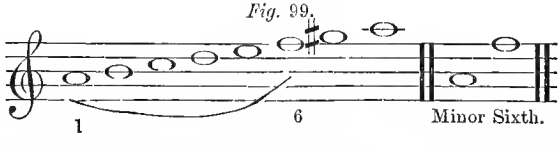
Fig. 98.



153. The third of these forms (*fig.* 98) has the advantage that while, equally with the second, it presents a *leading note*—so satisfactory to the modern ear—its 6th (to the tonic) remains minor (*fig.* 99).

154. The quality of the 6th of a scale is hardly less characteristic of its *mode* than that of the 3rd.

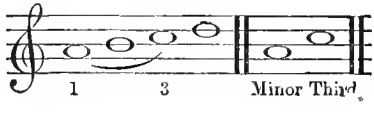
Fig. 99.



155. The chromatic form has also the advantage over both the others, that it is equally practicable (though somewhat difficult) to the voice, and satisfactory to the ear, ascending or descending.

156. Whatever form be adopted for the *upper* tetrachord of the minor scale, the *lower* tetrachord is *invariable*, so far as the place of the semitone is concerned, —the 3rd is *always* minor. Hence the term *minor* mode.

Fig. 100.



CHAPTER XV.

The Signatures of Minor Scales.

157. Scales which result from different *modes* of arranging the *same* sounds are said to be *relative*. The natural scales of C and A are therefore relative; and as the one is major and the other minor, the scale of A is said to be the *relative minor* of C, and the scale of C the relative *major* of A.

158. *Every* major scale has a relative minor, the tonic of which (as in the case of the natural scale) is the 6th sound of its relative major scale.

The 6th sound of the scale of C is A; A, therefore, is the relative minor to C.

159. "The sharps or flats, essential to the scale in which a musical composition is said to be," placed "together at the beginning of each stave," "are called the (scale) signature." (*Par.* 131.)

160. Every minor scale bears the *same signature* as its relative major; the 6th and 7th sounds being altered, if necessary, by *accidentals*.

In fig. 101 the signature of every major scale, *and of its relative minor*, is exhibited. It will be seen that—

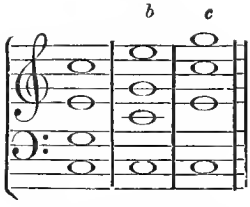
161. The minor, like the major, tonics follow one another in an order of ascending and descending perfect *fifths*.

Fig. 101 is a transcript of fig. 79, with the 6th to each major tonic added (in small black notes) above it. The 6th of a major scale is the *tonic* of its relative minor. The black notes, therefore, in fig. 101 are the relative minors of the white notes beneath them, and the signatures belong equally to both. (*Compare par.* 160.)

The table may be *read* thus:—The relative minor of C is A; signature, neither sharp nor flat. The relative minor of G is E; signature, F ♯. And so on.

162. The signatures of minor scales being identical in every case with those of their relative majors, it is of course impossible to decide, *from the signature alone*, in what scale a piece of music may be. A slight inspection and a moment's consideration will, however, generally remove all uncertainty on the matter. With rare exceptions, every piece of music *ends* with a combination formed of the tonic, its 3rd and 5th—the *triad* of the tonic—to which the 8th is as often added; the whole combination forming the *common chord* of the tonic. (*Fig.* 102.)

Fig. 102.



The relative *positions* of the notes of a common chord admit of great variety; *e.g.*, sometimes the 8ve is uppermost, sometimes the 3rd and sometimes the 5th (see fig. 102, *a*, *b*, *c*.); but the notes form always the same intervals with the tonic, *viz.*, the 3rd, 5th, and 8th.

163. Thus if a piece of *modern* music has for signature *two* sharps, it will certainly be *either* in the scale of D, or in that of its relative minor, B. If it is in D, the last combination will be that of D with its 3rd, 5th and (perhaps) 8th, *viz.*, D, F ♯, A, and D: if it is in the scale of B *minor*, the last combination will be that of B, *viz.*, B, D, F ♯, and B. Moreover, in the majority of modern movements the last chord of the tonic is immediately preceded by that of the *dominant*. The dominant (5th) of D is A; the triad of A is A, C ♯, E. The dominant of B is F ♯; the chord of F ♯ is F, A ♯ and C ♯— which A ♯, not being in the signature, will be specially marked.

The dominant chord is *always major*.

Fig. 103 is the ordinary ending of a piece in D major; fig. 104 that of a piece in B minor. The *signatures* of both are the same.

Fig. 103.

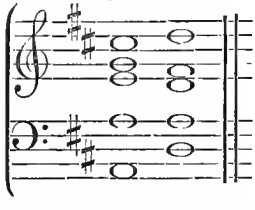
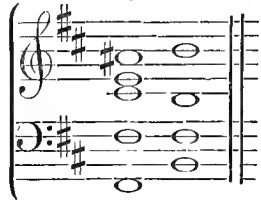


Fig. 104.



Both figures are *perfect cadences*. (*Compare par.* 91.)

164. A certain index of the minor mode is the frequent recurrence of the sharpened 7th and, with it, that of the sharpened 6th. The sharpened 7th of B minor is A ♯, the sharpened 6th, G ♯. In a piece of music bearing *two sharps* for its signature, the presence of A ♯, especially near the beginning or the end, would indicate the scale of B minor.

165. The sharpened 6th is *of itself* (as will be shown hereafter) by no means so certain an index of the minor mode as the sharpened 7th. This, however, is attended with little inconvenience, since the former is generally followed immediately by the latter.

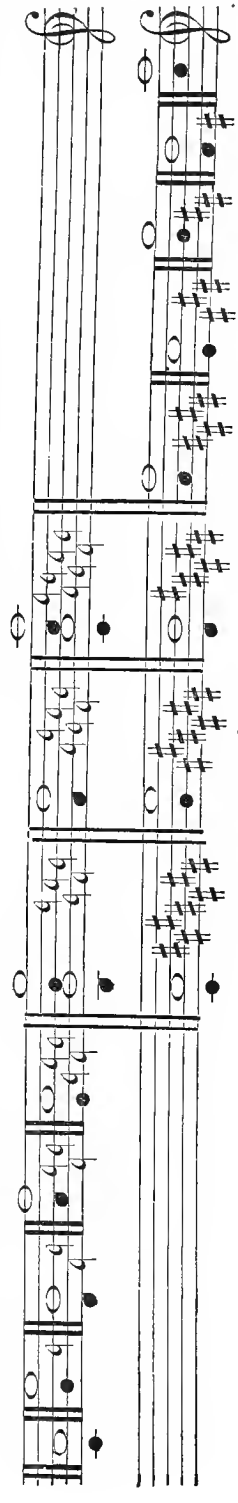


Fig. 101.

CHAPTER XVI.

Bars and Measures.

166. "Every rhythmical passage or strain of music is divisible into *phrases*. (*Par.* 22.) "Every phrase is further divisible into *feet*, and every foot into *times*, or *beats*." (*Par.* 23.)

167. The times or beats of a musical foot are *accented* or *un*accented. A foot consists either of *two* beats, one accented and one unaccented, or of *three* beats, one accented and *two* unaccented." (*Par.* 24.)

168. A musical passage composed of the former kind of feet is said to be in *duple* time; of the latter kind, in *triple* time. No kind of time *essentially* different from these two is used or, perhaps, possible.

169. The places of the accented beats in musical feet are indicated by lines drawn at right angles with the stave on which the notes composing them are placed. Such lines are called *bars*.

170. The group of notes enclosed by two bars is called a *measure*. The term *bar* is sometimes improperly applied to the measure itself.

171. The measures in the same musical passage are all of the same value; *i.e.* each measure takes the same time to perform.

If one measure consists of a minim, each of the other measures will also consist of a minim, or of something equal to it;—*e.g.* two crotchets, four quavers, one crotchet and two quavers, eight semiquavers, &c. &c.

Fig. 105 is in duple time; fig. 106, in triple time.

Fig. 105. HANDEL.

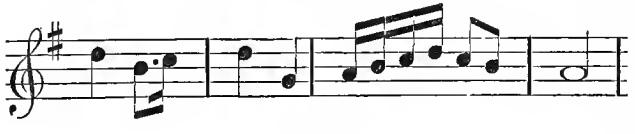
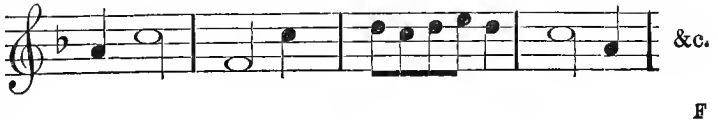


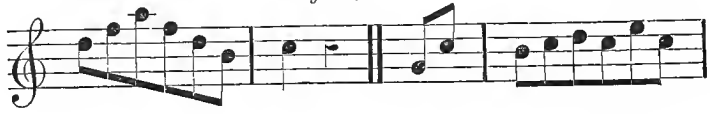
Fig. 106. PURCELL.



172. The *end* of a movement, or *section* of a movement, is usually marked by a *double* bar. When the last measure of the movement, or section, is *complete* the double bar takes the place of the single bar. When it is *in*complete, the double bar serves simply as a sign that the movement or section is ended—having no effect on the time whatever. (*Fig.* 107.)

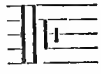
Fig. 107 consists of the end of one section and the beginning of another. The measure in which the double bar falls is to be performed at the same pace as those measures which precede and follow it.

Fig. 107. MOZART.



173. The *last* double bar of a piece of music is generally increased by the addition of two or three bars diminishing towards the end.

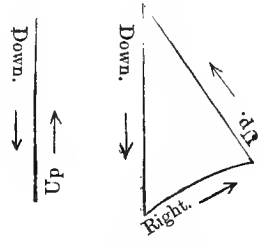
Fig. 108.



174. In practical music time is conveniently marked, or measured, by *beats* made with the hand, or a stick—in *duple* time, *down* and *up* (*fig.* 109), in *triple* time, down, *right* and up (*Fig.* 110.)

Fig. 109. *Fig.* 110.

In figs. 109 and 110 the *lines* indicate the spaces traversed by the hand (or stick) in beating time, and the *arrows*, the directions in which it moves.

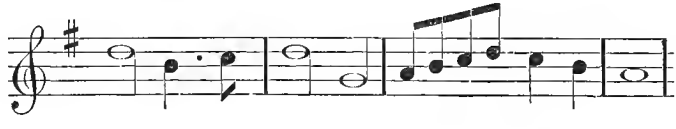


175 It matters not by what *form* of note each beat of a musical passage is represented, provided that the other notes are properly *proportioned* to it, and to one another, and that the beats are made throughout at the *same pace*.

Fig. 105 might, with equal propriety, be written like fig. 111, each beat being a *minim;* and fig. 106 like fig. 112, each beat being a *quaver:* provided only that each *minim* in fig. 111, and each quaver in fig. 112 was performed at the same pace as each crotchet in figs. 105 and 106.

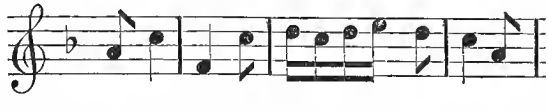
HANDEL.

Fig. 111.



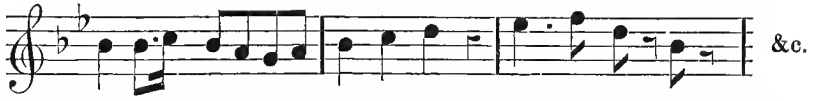
PURCELL.

Fig. 112.



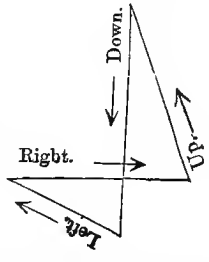
176. The monotony arising from a too frequent recurrence of accented notes, together with other practical inconveniences, has given rise to another form, in which *two* measures are thrown into one.

Fig. 113. MOZART.



177. This form is called *common* time; and, as its name would imply, it is the kind of time most frequently used.

Fig. 114.



178. In common time the beats are made,—*down, left, right, up;* the note performed when the *down* beat is made receiving a strong accent, and that on the *right* beat another accent, somewhat less strong.

179. The *down* beat in *every* form of measure is *naturally* the accented beat. Accentuations at variance with the natural (and ordinary) form are, however, occasionally made.

180. For example; notes lasting longer than one beat are sometimes *begun* on an *un*accented part of a measure (*Fig.* 115), or are *prolonged* from the *end* of one measure to the *beginning* of another. (*Fig.* 116.) In either case the natural and ordinary accent is disturbed.

Fig. 115. MENDELSSOHN.

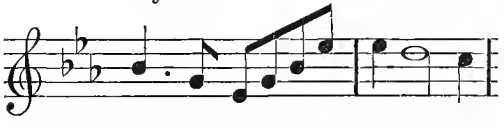
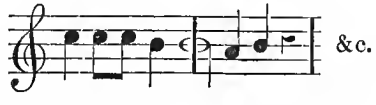


Fig. 116. GREEN.



The form in fig. 116 is generally expressed by modern musicians in another way. (*See Par.* 277.)

CHAPTER XVII.

Time—Simple and Compound.

181. Music of which the times or beats can be divided, *ad infinitum*, by *two*, is said to be in *simple* time.

All the examples in the last chapter are in simple time; for the value of each beat is in every case an *entire* note—a crotchet, a minim, or a quaver—divisible by two, *ad infinitum*.

182. *Compound* time arises from a mixture of the two species, duple and triple; each beat, in a measure of compound time, being a *dotted* note—divisible by *three*. (*Figs.* 117 *and* 118.)

Fig. 117.

Fig. 118.

183. A measure is said to be in *duple*, or in *triple*, time according to the number of *beats* into which it is divisible; it is said to be in *simple* or in *compound* time, according to the *sub*division (duple or triple) of which each beat is capable.

Figs. 119 and 120 are *both* in *duple* time, because each measure consists of *two* beats; but fig. 119 is in *simple* duple time, because each beat is a *whole* note (divisible *ad infinitum* by *two*); and fig. 120 is in *compound* duple time, because each beat is a *dotted* note (divisible by *three*).

Fig. 119.

Fig. 120.

Figs. 121 and 122 are both in *triple* time, because each measure consists of *three* beats; but fig. 121 is in *simple* triple time, because each beat is a *whole* note; and fig. 122 is in *compound* triple time, because each beat is a *dotted* note.

Fig. 121.

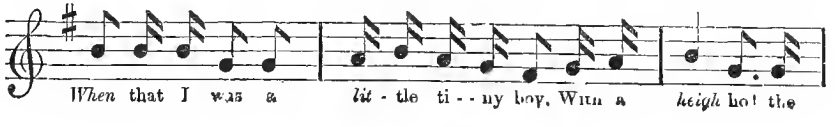
Fig. 122.

184. In a measure of *simple* time there is but *one* principal accent—that on the first *beat;* in a measure of *compound* time there is often (and always *may* be) a *subordinate* accent—on the first *note* of each *beat*.

In fig. 123 the accent falls on but one note and syllable (the first) in each measure—*when, lit, heigh*, &c.

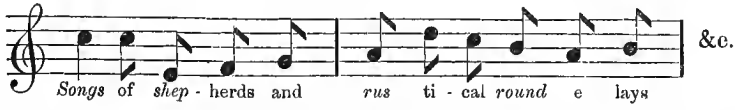
Fig. 123.

Old English Air.



In fig. 124, besides the principal accents (on *songs* and *rus*), there are subordinate accents (on *shep* and *round*), necessitated by the triple division of the *beats* to which those notes belong.

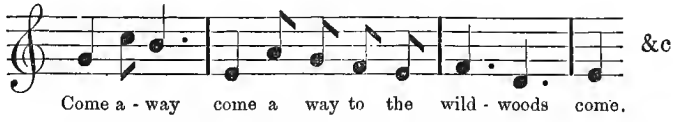
Fig. 124. Old English Air.



185. When a beat, in a measure of compound time, consists of a *single note* the subordinate accent is not felt; the time being compound *to the eye* only.

In the *first* measure of fig. 125 the subordinate accent is not expressed, seeing that the second beat is entirely filled by the one note over the syllable *way*. In the *second* measure, the subordinate accent is indispensable, because the second beat consists of *three* notes. The *third* measure is *practically* in simple time, since both the beats consists of *single notes*.

Fig. 125.



186. The beats, as well in compound as in simple time, are sometimes (more especially when the *pace* is very slow) subdivided.

Thus four beats might be made to each measure of fig. 123, or six to each measure of fig. 124, were they to be sung at a slow pace. This, however, is a matter simply of practical convenience, in no way interfering with the real divisions of the measure. Fig. 124 could, by no possibility, be regulated by *four* equal beats, nor fig. 123 by *three*.

CHAPTER XVIII.

Time Signatures.

187. The number, accent, and kind, of the notes contained in each measure of a musical movement are indicated by the *time signature*, placed at the beginning, immediately after the *scale* signature.

188. Time signatures consist, for the most part, of *fractions*—having reference to the modern *whole note*, the semibreve; the fraction showing how much of, or how much more than, a *semibreve* each measure contains.

Thus $\frac{2}{4}$ indicates a time of two crotchets, *i.e.*, *two fourths* of a semibreve, in a measure; $\frac{6}{8}$, a time of six quavers, *i.e.*, *six eighths* of a semibreve, in a measure.

189. Quadruple, or *common*, time of four crotchets in a measure is specially indicated by a character, C

C is not, as might be supposed, the initial of the word "common," but properly a half circle (, the symbol of what the old masters held to be *imperfect* time,—in contradistinction to *perfect*, or triple time, indicated by an entire circle ○. (*Compare par.* 24.)

190. *Units* are occasionally, though not commonly, used as time-signatures. 1 indicates a time of *one semibreve* in a measure (common time); and 2 the older form of two semibreves.

191. Thus at the opening of a movement we find commonly three characters, or groups of characters—the clef, the essential sharps or flats, and the time signature. The first two are usually repeated at the beginning of *every* stave of each part; the last is never expressed *but once* in each part—at the beginning.

Fig. 126.

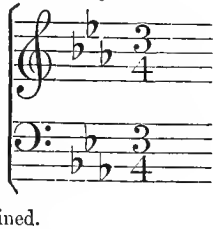


Fig. 126 is the commencement of a (piano-forte) movement (*compare par.* 37) in the *scale* of E ♭ (*see fig.* 79), and in "three four" time; *i.e.*, triple time of three *crotchets* in a measure.

In fig. 127 all the time signatures in common use are exhibited and explained.

The *number* of the notes following each signature shows the *number of beats* in each measure; the *form* of each note shows the *value* of each beat.

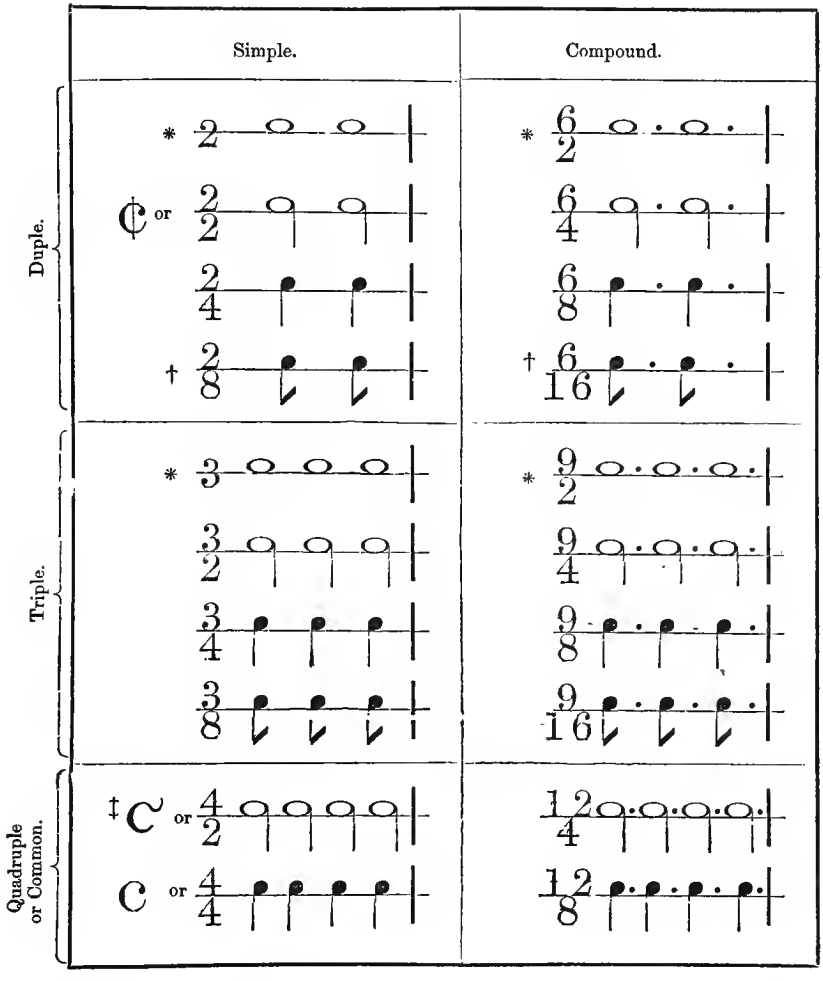
The forms marked * are only found in ancient music; those marked † are modern, but rarely used.

Musical practice is not consistent in regard to the character marked ‡; some composers designating $\frac{4}{2}$ time by ₵ and others by C, or even C (the sign of $\frac{4}{4}$ time), restricting ₵ to $\frac{2}{2}$ time. It is greatly to be wished that all three characters were banished from the time table, and that the signatures were confined to numbers.

192. The numerator in *triple* time signatures is always an *odd* number—in *simple* triple time, *three*, in compound triple, *nine*. The numerator in *duple* and *quadruple* time signatures is always an *even* number—in *simple* time, two or four, in *compound* time, six or twelve.

Fig. 127.

Table of Time Signatures.



193. The fractions in time signatures are not always expressed in their simplest or lowest forms, *i.e.*, reduced to their lowest terms. Nor could this reduction be made in every instance with safety; seeing, for example, that $\frac{3}{4}$ and $\frac{6}{8}$ are the signatures of two kinds of time *differing in every essential particular.*

194. $\frac{3}{4}=\frac{6}{8}$. A measure with the former signature may, and often does, contain the same *number* of the same *kind* of notes as a measure with the latter signature, *viz.*, *six quavers.* Yet $\frac{3}{4}$ being the signature of *simple triple,* and $\frac{6}{8}$ of *compound duple,* time the *accentuation* of those six quavers will be altogether different.

195. The natural divisions (times or beats) of a measure of $\frac{3}{4}$ time are *crotchets*, of which it will contain *three*, or their value. The natural divisions o a measure of $\frac{6}{8}$ time are *dotted* crotchets, of which it will contain *two*, or their value. These divisions are generally expressed by the *grouping*. (*See figs.* 128 *and* 129.)

Fig. 128.

Fig. 129.

The system of time signatures is certainly far from perfect; it is, however, universally accepted and (among musicians) understood. As any change in the alphabet of a universal language like music is likely to be made very slowly, and as no change would affect *existing music*, the student must be content, for the present, to remember that though in *arithmetic* $\frac{3}{4} = \frac{6}{8}$ in ***music***, these fractions represent things essentially different.

See Appendix—"Time Signatures."

CHAPTER XIX.

Accidentals.

196. Sharps or flats which, being over and above those in the *signature* of a piece of music, are placed before *individual* notes, are called *accidentals*. Under this term are included also those *naturals* which *contradict* foregoing sharps or flats, whether essential or accidental.

197. The effect of an accidental lasts *throughout the measure* in which it is once used; *i.e.*, it alters *every* following note in it, of the same name as the one which it *immediately* precedes,—unless it be contradicted by another accidental.

In fig. 130, the second F is *sharp* as well as the first. In fig. 131, the second B is *flat* as well as the first.

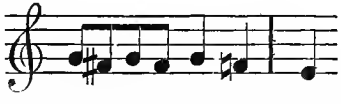
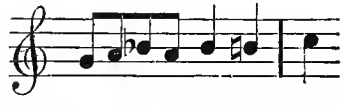
Fig. 130. 

Fig. 131. 

198. When the *first* note of one measure is *unisonous* with the *last* note of the measure immediately preceding it, an accidental placed before the latter note affects *also* the former, and any number of like notes in immediate succession. When the two notes are *tied* (*see Chap. XXVI.*), the accidental is usually repeated before the *second* of the "like notes in immediate succession."

The Fs in the second measure of fig. 132 are sharp; so also is the *first* F in the second measure of fig. 133.

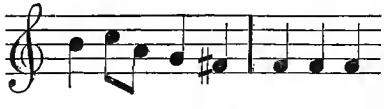
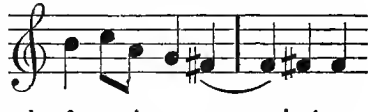
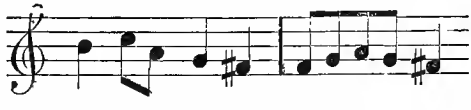
Fig. 132. 

Fig. 133. 

199. When the repetition of a note altered in the foregoing measure is *interrupted*, the accidental *must* be repeated. (*Fig.* 134.)

Fig. 134. 

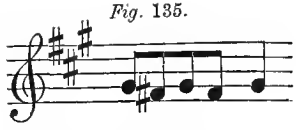
The student must be prepared to meet with many inconsistencies in musical practice as respects accidentals—more especially *double* sharps and flats.

200. "A double sharp raises, and a double flat lowers, a note *two semitones*,"—not a tone. (*Compare par.* 137.)

Every tone may be *divided* into two semitones, but every two semitones do not *make* a tone.

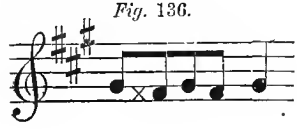
201. When a note *essentially* sharp or flat is required to be raised *another* semitone, a *single* sharp or flat, *in addition to* that already in the signature, makes it, assuredly, *doubly* sharp or flat. (*Fig.* 135.)

Fig. 135.



202. This rule is observed by some composers. Others, however, desirous of avoiding ambiguity, invariably precede double sharp or flat notes by × or 𝄫, without reference to the single sharp already marked in the signature. (*Fig.* 136.)

Fig. 136.



Theoretically, the **F**s in fig. 136 are certainly *treble* sharp.

203. Again. When a double sharp or flat note is followed, in the same measure, by a *single* sharp or flat note of the same name, some writers precede the latter by a single sharp or flat, and others by a natural, *as well as* a sharp or flat.

Fig. 137.

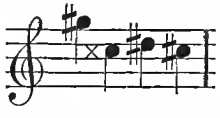
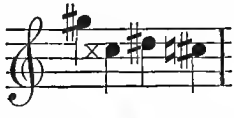


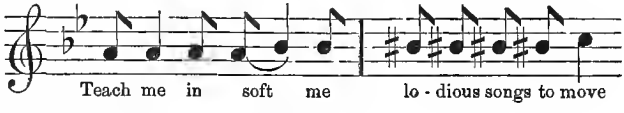
Fig. 138.



The form of fig. 138 is the more common. The natural is of more recent invention than the sharp or flat; and in music printed as late as the beginning of the last century the sharp is often used, as the natural is now, to restore a flat note to its original pitch.

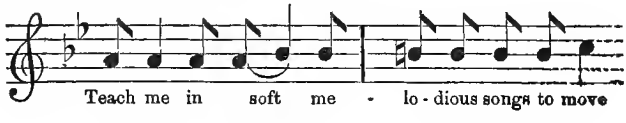
The following is from Purcell's *Orpheus Brittanicus*. Third Edition, 1721.

Fig. 139.



In modern notation the passage would stand thus:—

Fig. 140.



CHAPTER XX.

Chromatic Intervals.

204. The epithet *diatonic* (from the Greek) is applied to the natural scale (and to all scales of like *construction*) because, in singing it, we pass principally *through tones*. A scale *purely* diatonic would be inconsistent with the modern, or perhaps with any, musical system; it would certainly be intolerable to the modern ear.

205. By a diatonic scale is *now* understood a series of eight different sounds, the extremes of which are octaves to each other, separated by *five* tones and *two* semitones.

The scales in fig. 40 are all diatonic.

206. The two semitones essential to the (modern) diatonic scale are called *diatonic* semitones. Two notes separated by a diatonic semitone are invariably of *different* names.

207. A *chromatic* semitone is the interval between two proximate notes of the *same* name, *one* of which is altered by a sharp or flat.

208. "Between every two sounds separated by a tone, an intermediate sound may be placed, whereby the tone is divided into two semitones." (*Par.* 92.) *One* of these two semitones will, of necessity, be *chromatic*.

Fig. 141.

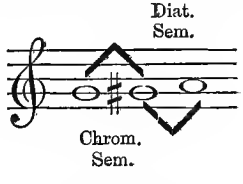
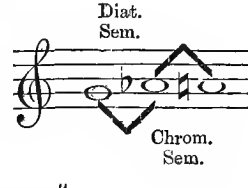


Fig. 142.



In fig. 141, the first semitone (G-G ♯) is *chromatic*, the second (G ♯-A is diatonic. In fig. 142, the first semitone (G-A ♭) is *diatonic*, the second (A ♭-A ♮) is chromatic.

209. Intervals resulting from *any* arrangement or juxtaposition of notes found in the *same diatonic* scale are called *diatonic* intervals.

210. Diatonic intervals (*compare Chap. VI.*) are major and minor seconds and thirds, and their inversions minor and major sevenths and sixths; perfect fourths, and their inversions perfect fifths; pluperfect fourths, and their inversions imperfect fifths (of each of which the same diatonic scale never includes but *one*); and the octave, of which the inversion is the *unison*—not properly an interval.

211. Certain intervals of which the upper notes are raised, or the lower depressed, a *chromatic* semitone, are said to be *augmented*. Certain intervals of which the upper notes are lowered, or the lower notes raised, a chromatic semitone, are said to be *diminished*.

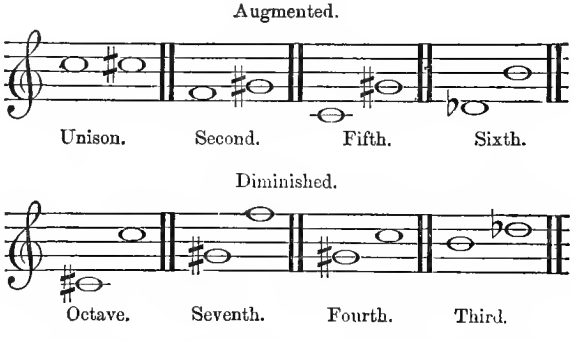
212. The unison, major second, perfect fifth, and major sixth admit of *augmentation* only; and their several inversions, the octave, minor seventh, perfect fourth, and minor third, of *diminution* only.

The unison, though "not properly an interval," is, for the sake of system, often classed as such. The *augmented* unison, *i. e.*, chromatic semitone—the agent of all augmentation and diminution—is one of the most important of intervals.

213. The *augmented* unison, second, fifth, and sixth, and their inversions, the *diminished* octave, seventh, fourth, and third, are classed under the general name of *chromatic intervals*.

Fig. 143 contains an example of each of the chromatic intervals.

Fig. 143.



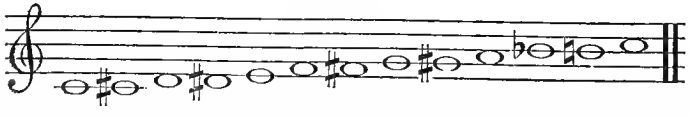
The word *chromatic* (from the Greek, *χρωμα, colour*), originally had reference to the ink (of different colour) used to express altered notes; it has been retained possibly on account of the peculiar effect (figuratively, *colour*) which such notes gave to passages in which they were introduced.

214. A scale which contains one or more chromatic intervals is called a *chromatic scale*.

215. The third form of the minor mode (*Fig.* 98) is chromatic, because its 6^{th} and 7^{th} sounds are separated by an *augmented* second.

216. A scale is *more or less* chromatic, according to the *number* of chromatic intervals it contains. The third form of the minor scale is only chromatic in so far as *one* interval, the *augmented* second, is concerned. Fig. 144, the *most* chromatic form of scale possible, is generally called *the* chromatic scale. It consists exclusively of semitones—in all, *twelve;* seven diatonic, and five chromatic.

Fig. 144.

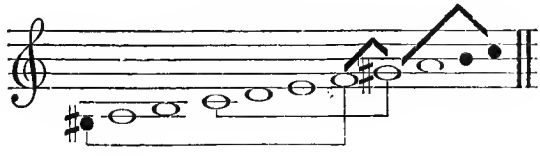


As every sound is *practically* identical with another (C ♯ with D ♭, &c.), there are many different ways of expressing the chromatic scale, the choice among which will be governed by circumstances. Fig. 144 is the commonest form.

217. Of the chromatic intervals (*Fig.* 143) the augmented *second* and diminished *fourth* are more frequently used, especially in *melody*, than any others,—because they can be produced by the juxtaposition of notes which form part of the same (minor) scale.

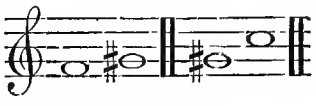
Scale of A minor.

Fig. 145.



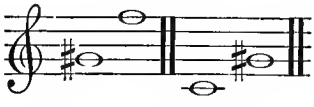
F and G ♯ form an *augmented second;* G ♯ and C a *diminished fourth.* The latter interval includes the two most characteristic notes of the scale in which it is found—the leading note and the 3rd.

Fig. 146.



218. The inversion of the first of these intervals, the diminished seventh, is more sparingly, and that of the latter, the augmented fifth, hardly ever used in melody.

Fig. 147.



219. The diminished third and the augmented sixth are of still less frequent occurrence; the former being, by some theorists, considered altogether inadmissible in *harmony*, the latter in *melody*.

CHAPTER XXI.

Modulation.

220. Accidental sharps, flats, or naturals may arise, as we have seen, from either of two causes,—the introduction of the altered 6th or 7th of the minor mode (*Chap.* 14), or a change of *genus*, from diatonic to *chromatic*. The sharpened 6th and 7th of the minor scale, never being marked in the signature, are of necessity expressed by accidentals (*Par.* 160); and no chromatic interval can be formed without at least *one* altered note.

221. To these two causes of accidentals is to be added a third which, though partially connected with the first two, must be considered separately—*modulation*.

222. Every musical movement is said to be *in some particular scale*. This expression, though true in the main, must be understood with some qualification. Since, though in every well constructed movement "some particular scale" *prevails*, or furnishes the majority of the notes of which it is made up, few movements, however short or simple, remain *throughout* in *one* scale; on the contrary, most movements present points of deviation into *other* scales, and even contain passages the scales of which are equivocal.

223. This deviation, when made into scales *connected* with the original scale and with one another, is called *modulation;* when made, at once, into scales not so connected, it is called *transition*.

224. Modulation is much more frequently used than transition; and the most common modulations are between scales which contain the greatest number of *common notes*, and which are therefore most intimately "connected."

225. Thus the scale of C differs from that of G only in one note, F, which is *natural* in the former scale, and *sharp* in the latter,—from that of F only in one note, B, which is *natural* in the former scale and *flat* in the latter. While the connexion between the scale of C and that of A minor is still closer—the latter, in its original unaltered form, consisting of the *very same* notes as the former. (*Par.* 157.)

226. The commonest modulations, therefore, are from any given scale to that of the perfect 5th above it—requiring but *one* additional *sharp* (*Par.* 119); to that of the perfect 5th below it—requiring but *one* additional *flat* (*Par.* 122); to that of its relative minor; and to that of the relative minors of the 5th above, and of the 5th below.

The recognition and consciousness of the tonic, under whatever variations of *tonality* (changes of scale), is indispensable to the intelligent and *certain* performance especially of *vocal* music; and its frequent modulation constitutes one of the principal difficulties of modern music. This difficulty is

especially felt in performance from *single parts*, wherein the modulations are often but imperfectly expressed. Indeed, without examining a *score*, it is often difficult, and sometimes even impossible, to tell *by the eye*, into what scale a composition has wandered. Two or three rules will however serve to meet cases of ordinary difficulty, and enable the vocal performer to ascertain the tonic for the time being.

227. The tonic of the new scale (*i.e.*, the scale into which the last modulation has been made) is generally found a *minor second* above the *last* added *sharp*, or a (perfect) *fourth below* the last added *flat*.

Fig. 148.

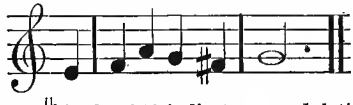
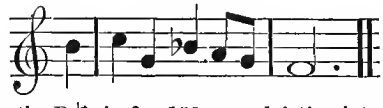


Fig. 149.



The F ♯ in fig. 148 indicates a modulation into G: the B ♭, in fig. 159, a modulation into F.

228. The new scale is unmistakeably indicated by the presence of a *pluperfect* fourth, or an *imperfect* fifth; since there is but *one* of either in every scale. These intervals may appear either between two notes following in immediate succession or produced simultaneously; *i.e.*, either in melody (*fig.* 150) or in harmony (*fig.* 151).

Fig. 150.

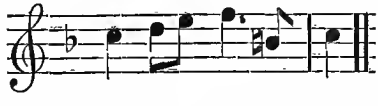


Fig. 151.

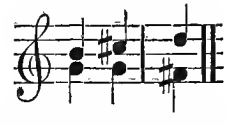


Fig. 150, an extract from a movement in F, ends with a modulation into C. *Either* of the two notes (F or B ♮) which mark the modulation might belong to many different scales, but *both together* can only be found in C. So G ♮ and C ♯ (*fig.* 151) can only *be combined* in D.

229. The *mode* (major or minor) of a new scale can only be determined by the presence of the 3rd from the tonic. (*Par.* 145.)

In fig. 152, there is a modulation from C into D; whether it is into D *minor* or D *major* is uncertain, seeing that F (the 3rd to D) is not expressed. The addition of the (major) 3rd, F ♯, to the last chord of fig. 153 decides the mode.

Fig. 152.

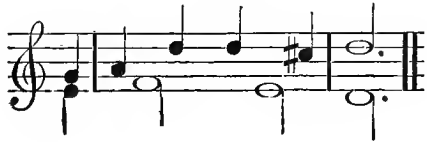
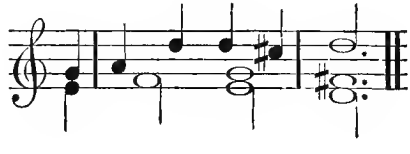


Fig. 153.



CHAPTER XXII.

Transposition.

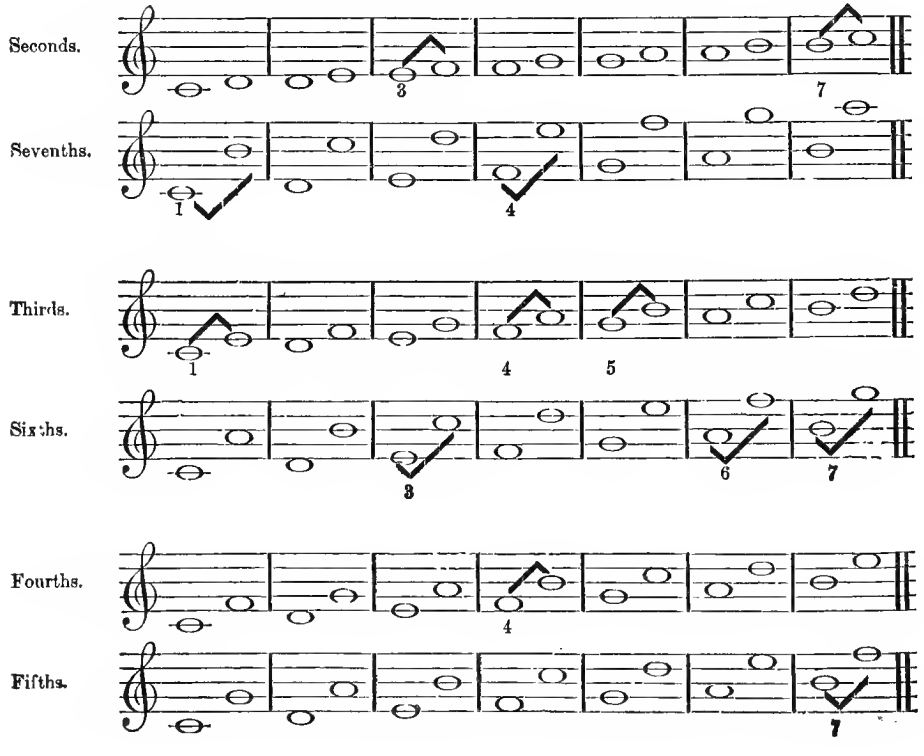
230. In the natural scale of C are found *five* major and *two* minor *seconds*, and (their inversions) *five* minor and *two* major *sevenths; three* major and *four* minor *thirds*, and (their inversions) *three* minor and *four* major *sixths; one* pluperfect and *six* perfect *fourths*, and (their inversions) *one* imperfect and *six* perfect *fifths*. (*Compare Chap. VI.*)

231. The 3rd and 7th sounds (mediant and leading note) bear *minor* seconds—*all the other* sounds bear *major* seconds; the 1st and 4th sounds bear *major sevenths*, and all the others, *minor* sevenths. (*See fig.* 154.)

232. The 1st, 4th, and 5th sounds (tonic, dominant, and subdominant) bear major thirds—*all the other* sounds bear *minor* thirds; the 3rd, 6th, and 7th sounds bear *minor sixths*, and all the others, *major* sixths.

233. The 4th sound (subdominant) bears a *plu*perfect *fourth*—all the other sounds bear *perfect* fourths. The 7th sound (leading note) bears an *im*perfect *fifth*—all the others, *perfect* fifths.

(*Fig.* 154.) INTERVALS FOUND IN THE NATURAL SCALE.



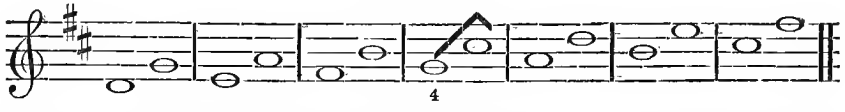
The two minor seconds and the two major sevenths, the three major thirds and the three minor sixths, and the one pluperfect fourth and the one imperfect fifth, being severally *inversions* of each other, are found between notes of the *same name*.

The two minor seconds are E-F and B-C, the two major sevenths are F-E and C-B; the three major thirds are C-E, F-A, and G-B, the three minor sixths are E-C, A-F, and B-G; the one pluperfect fourth is F-B, the one imperfect fifth is B-F. (*See fig.* 154.)

234. The natural scale of C is the type, or model, of *all* major scales, in the modern system. In all major scales, therefore, the several sounds (1st, 2nd, &c.) bear the same intervals as in the scale of C; for the sharps or flats by whose agency the *order* of tones and semitones is adjusted in the scale itself, operate equally on every individual interval which may be drawn from it.

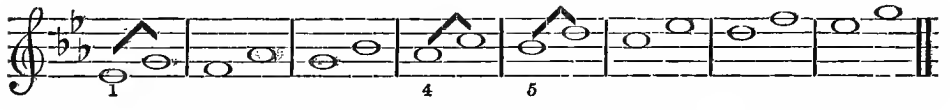
235. *E.g.* "The 4th sound" of the scale of C "bears a pluperfect fourth—all the other sounds bear *perfect* fourths." (*Par.* 233.) So does the 4th sound of the scale of D, *viz.*, G, the 4th to which is C ♯; the C in the scale of D being essentially *sharp*. All the other sounds bear perfect fourths. (*Compare fig.* 154.)

Fig. 155.



236. Again, "the 1st, 4th, and 5th sounds of the scale of C bear *major* thirds—all the other sounds bear *minor* thirds." (*Par.* 232.) So do the 1st, 4th, and 5th sounds of the scale of E ♭, *viz.*, E ♭, A ♭, and B ♭ (all flat in the scale of E ♭), the 3rds to which are G, C, and D. All the other sounds bear minor thirds. (*Compare fig.* 154.)

Fig. 156.



Pars. 231-2-and-3 are, therefore true, not only of the scale of C, but of *every other major scale*.

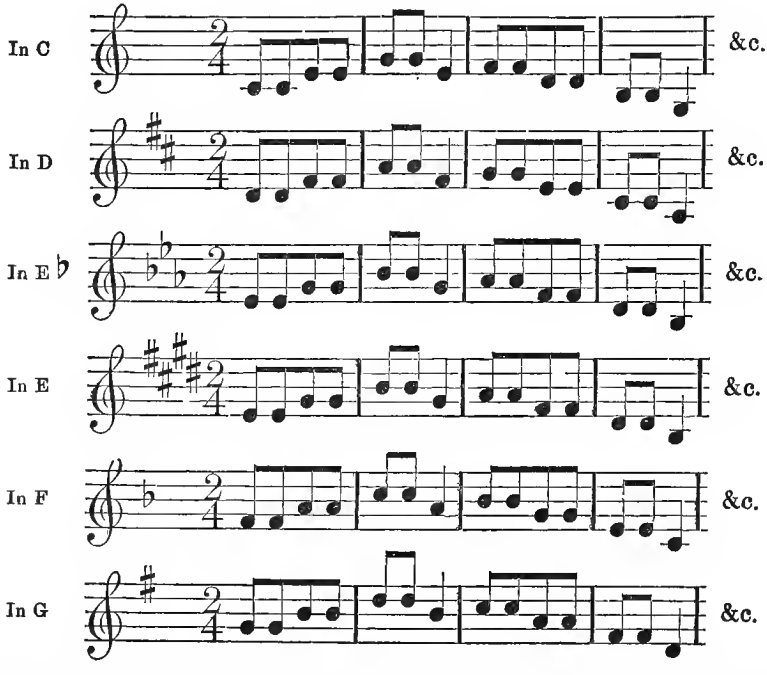
237. "Melody, or tune, does not depend on the absolute, but on the *relative*, pitch of sounds—on their distances apart." (*Par.* 17.) When the notes of a musical passage are separated by the *same intervals*, the *melody* they form will be the same. Any musical *idea* may, therefore, be expressed at *any* pitch, *i.e.*, in *any* scale.

238. The expression of a musical idea in a scale other than that in which it was first conceived or expressed, is called *transposition*.

239. In transposing a passage from one scale to another, we represent each note in the one scale by the *corresponding* note (the note occupying the same *place*) in the other, and *adjust* the intervals of which it is composed, by substituting the *signature* of the new scale for that of the old one.

Thus, fig. 157 is in the scale of C, which requires neither sharp nor flat. To transpose it into D we must place *two sharps* at the head of the stave; to transpose it into E ♭, *three flats;* into E, *four sharps;* into F, *one flat;* into G, *one sharp*, and so on.

Fig. 157. HAYDN.



The student is recommended to try the effect of the above transpositions *without* sharps or nats.

CHAPTER XXIII.

Rhythmical Licences.

240. The rhythmical licences admissible in musical performance consist in the compression of more than its proper complement of notes into a single beat, and in the slackening, or accelerating, the pace of particular beats. Of the former, the most common example, the *triplet* or *triolet*, has been already noticed.

241. "A triplet is a group of *three* notes, which (by licence) is performed in the time of *two* of the same kind." (*Par.* 49.)

242. The triplet is but another mode of indicating a change of time, from simple to *compound*, in the particular passages where it is introduced.

Figs. 158 and 159 are identical.

Fig. 158.

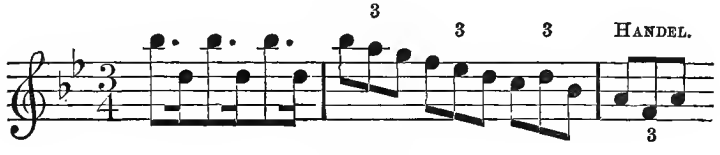
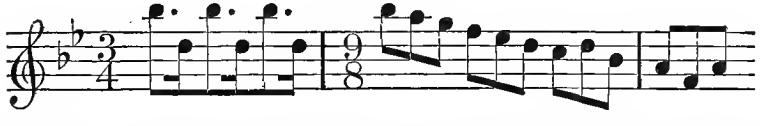


Fig. 159.



243. With the triplet may be classed all groups whatever of irregular rhythmical formation. In modern instrumental music these are found in great numbers and variety,—*five* or more notes being sometimes compressed into the time of *four* of the same kind, *four* or more, into that of three, &c. &c.

Such groups are best studied in connexion with musical practice.

Departure from the average *pace* of a movement in the case of "particular beats," is indicated by the Italian words, *Rallentando, Accelerando,* &c., to be explained in Chapter XXVII.

CHAPTER XXIV.

Graces.

244. Passages not forming an integral part of a movement—which without essential loss to it might be, and often are, omitted—are called *graces*, or embellishments. The principal graces used in *melody* are the *appoggiatura*, the *beat*, the *shake*, the *turn*, the *acciaccatura*, and the *portamento*. The principal graces used in *harmony* are the *tremolando* and the *arpeggio*. Graces are, for the most part, expressed in *smaller* notes than those used for the integral parts of a movement.

245. The *appoggiatura* (from *appoggiare*, Ital., *to lean*) is a small note, which, being prefixed to another, robs it of its *accent* and a portion of its time.

246. In general, the appoggiatura is a note of *half* the length of the note which it displaces; but its full time should be given to the appoggiatura, whatever be its length—the following note being shortened accordingly.

Figs. 160 and 161 are severally identical with figs. 162 and 163.

Fig. 160. HANDEL.

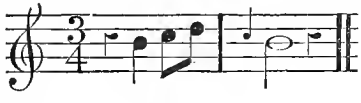


Fig. 161.

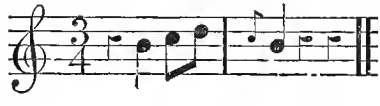


Fig. 162.

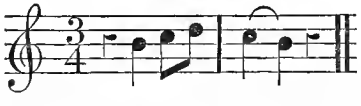
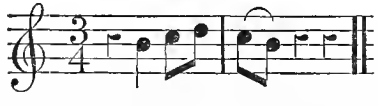


Fig. 163.



Latterly, the appoggiatura has been falling into desuetude; modern composers preferring the less equivocal forms of ordinary notation. Fig. 164 would certainly have been expressed by an earlier master as fig. 165.

Fig. 164. MOZART.

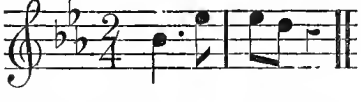
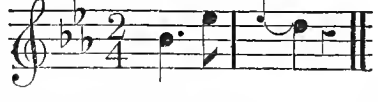


Fig. 165.

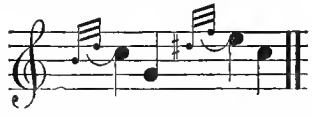


247 The *beat* is a short appoggiatura, made on the semitone below a principal note. Its effect is to give force and especial emphasis to that note.

Fig. 166.

248. The *acciaccatura* (from *acciaccare*, Ital., *to pound*) is a group of two notes, introduced with the utmost rapidity, before another note. The interval formed ov the two notes should never *exceed* a *minor* third.

Fig. 167.



249. The appoggiatura, beat, and acciaccatura should severally be uttered *on* the beat due to the note which they precede—not before it

250. The *shake* consists in a rapid alternation of two adjacent notes. It is indicated by *tr.*, a contraction of the Italian word *trillo*, placed over a note which is generally preceded by an appoggiatura.

Fig. 168 is to be performed like fig. 169.

Fig. 168.

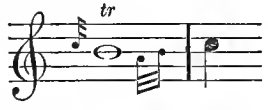
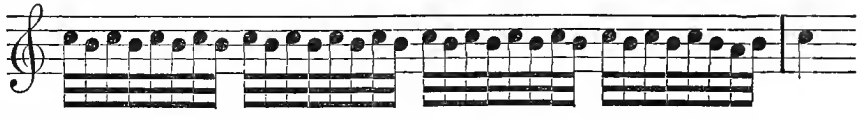


Fig. 169.



251. The shake, unless it be a very short one, is always concluded by a *turn*. (*See fig.* 169.)

252. The *turn* is a group composed of a principal note, and two subsidiary notes, one above and one below it. It is indicated by ∼, or ≀ placed over the principal note. ∼ is the sign of the *direct*, and ≀ of the *inverted*, turn.

Fig. 170, which contains an example of the direct, as well as of the inverted, turn, should be performed like fig. 171.

Fig. 170.

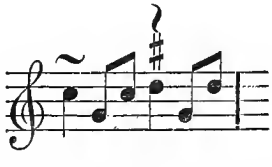
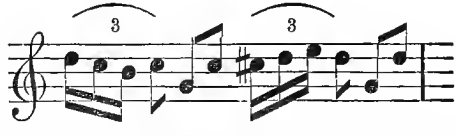


Fig. 171.



253. The turn, like the appoggiatura, beat, and acciaccatura, should be begun *on* the beat due to the note *over* which it is placed. When it is placed *between* two notes, it should follow the first of them.

Fig. 172 is to be performed like fig. 173.

Fig. 172.

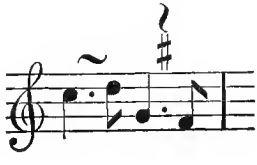
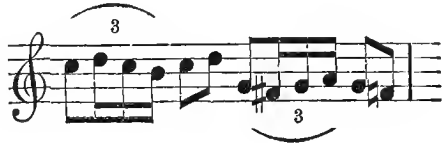


Fig. 173.



254. The *portamento* (from *portare*, Ital., *to carry*) consists in the smooth utterance of two following notes, part of the time due to the first of which is given to the *anticipation* of the second. When (in vocal performance) each note has its own syllable, the anticipated portion of the second note is sung to the first syllable.

Fig. 174 is to be performed like Fig. 175.

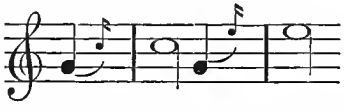
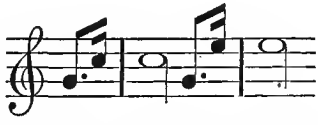
Fig. 174. 

Fig. 175. 

255. The *tremolando* (from *tremolare*, Ital., *to tremble*) is produced either by the rapid iteration of the same sound or the alternation of different sounds in the same combination.

Figs. 176 and 177 are performed like figs. 178 and 179.

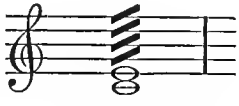
Fig. 176. 

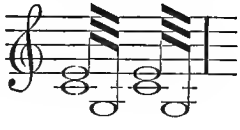
Fig. 177. 

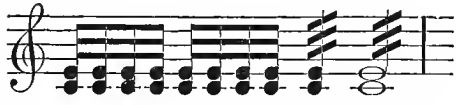
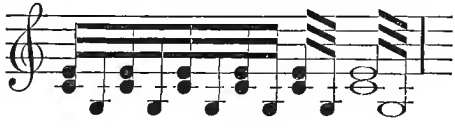
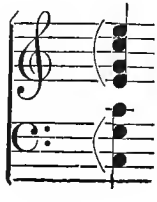
Fig. 178. 

Fig. 179. 

256. The *arpeggio* (from *arpeggiare*, Ital., *to play upon the harp*) consists in striking the sounds of a chord in rapid succession, instead of simultaneously. It is indicated as in fig. 180.

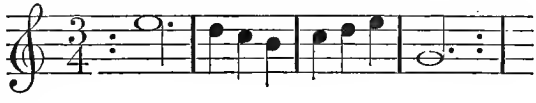
Fig. 180. 

CHAPTER XXV.

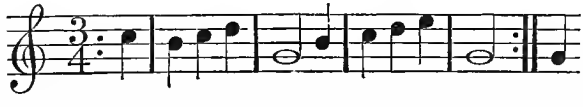
Signs of Repetition, Contractions, &c.

257. The alphabet of music includes, besides notes, many characters, and even words, indicative of the style or manner of performance of the movements, particular passages, or individual notes, to which they refer.

258. Repetition is indicated by *dots* enclosing the passage to be repeated. These dots are generally, though not always, placed at the beginning and end of a measure.

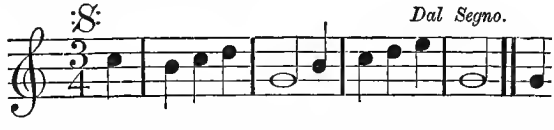
Fig. 181. 

259. Sometimes one or both of the bars enclosing a passage to be repeated are doubled; but the double bar is most often, though not always, introduced when the last measure of the passage to be repeated is incomplete.

Fig. 182.  &c.

260. The beginning of the passage to be repeated is frequently indicated by a *sign* :𝄋:, referred to at the end of it by the (Italian) words *Dal Segno*, i. e., *from the sign.*

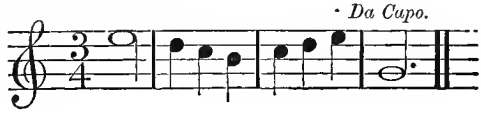
Thus, fig. 182 might be expressed like fig. 183.

Fig. 183. 

&c.

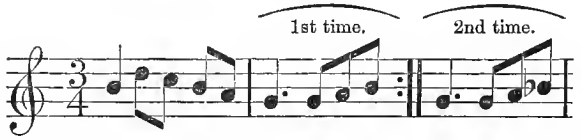
261. When the repetition is to be made from the *beginning* of a movement the dots are often omitted, and the words *Da Capo* (*from the beginning*), or *Da Capo al Segno* (*from the beginning, at the sign*), if there be a sign, are used.

Thus, fig. 181 might be expressed like fig. 184.

Fig. 184. 

262. When, on repetition, any measure or measures are to be omitted, the words "1st *Time*" are placed over *them*, and the words "2nd *Time*," over those to be substituted for them.

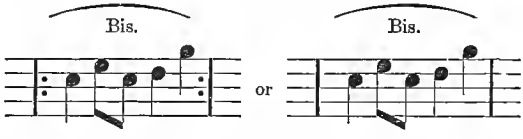
Fig. 185.



&c.

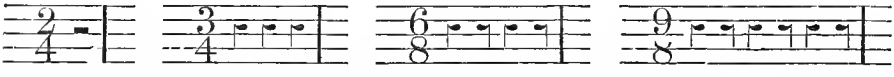
263. The repetition of a *single* measure is sometimes marked by the word *bis* (twice) placed over it in addition to, or instead of, the dots.

Fig. 186.



264. Silence lasting an entire measure (properly represented only by *rests* equal to the contents of that measure) is often expressed by a *semibreve* rest, whatever be the kind of time employed.

Fig. 187. *Fig.* 188. *Fig.* 189. *Fig.* 190.



Figs. 187, 188, 189, and 190, are all occasionally represented by fig. 191—the form properly applicable to *common* time only.

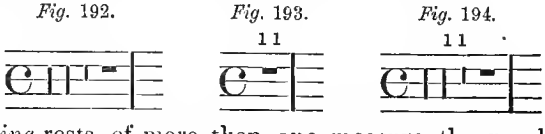
Fig. 191.

265. Silence lasting *longer* than one measure is, in single parts, generally indicated by a number, or numbers, placed over a semibreve rest, representing the number of measures of silence.

266. In ancient music the necessity for these figures was obviated by the employment of the *breve*, and the *long* (*double breve*) rest.

Fig. 192, equally with fig. 193, indicates a rest of *eleven* measures. The two forms are sometimes combined, as in fig. 194.

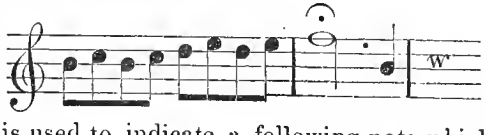
Fig. 192. *Fig.* 193. *Fig.* 194.



267. In *counting* rests of more than one measure the numbers (of the measures) should be *told off* on the first beat of each. Thus fig. 192 should be counted, *One*, two, three, four; *Two*, two, three, four; *Three*, two, three, four; and so on to *Eleven*, two, three, four.

268. A *pause* placed over or under a note indicates generally that the sound due to it may be sustained as long as the performer pleases. (*Fig.* 195.) A pause is sometimes used to mark the *end* of a movement.

Fig. 195.



269. The *direct* (W) is used to indicate a following note which it is not convenient or necessary to express. It is especially used at the end of a line or the bottom of a page, as a preparation for the next.

CHAPTER XXVI.

Marks of Expression.

270. A *dash* placed over or under a note indicates that it is not to be sustained throughout the beat, or portion of a beat, due to it, but *interrupted*, as though it were a much shorter note followed by rests. A *dot* placed over or under a note indicates a modified form of the effect due to the dash.

Fig. 196 should be performed like fig. 197, and fig. 198 like fig. 199.

Fig. 196.

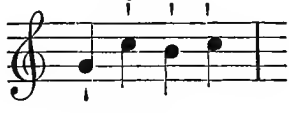


Fig. 197.

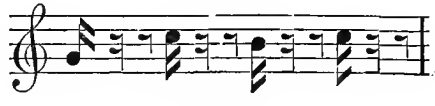


Fig. 198.

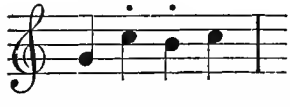
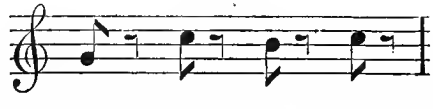


Fig. 199.



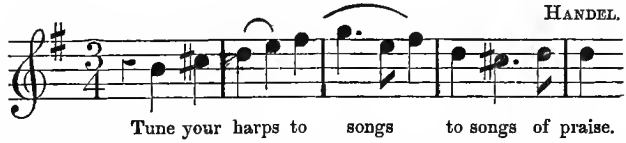
271. Dashes are sometimes placed over *minims*, where they are understood to imply the effect represented by the word *sforzato* (forced). (*See fig.* 211.)

272. Notes with dashes over them are said to be performed *staccato*, *i. e.*, cut off, separated; notes with *dots* over them, *mezzo-staccato*, *i. e.*, *half*-staccato.

273. A *slur* placed over or under two or more notes indicates that they are to be performed *legato*, *i. e.*, smoothly (literally, *bound together*). In vocal music, the slur indicates that the notes under or over it are to be *vocalized*, *i. e.*, sung to one syllable.

HANDEL.

Fig. 200.



274. When *two* notes only are slurred, a *stress* should be laid on the first, and the second should be made staccato.

Fig. 201 should be performed like fig. 202.

Fig. 201.

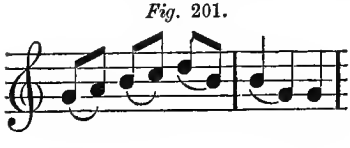
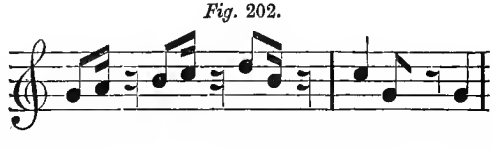


Fig. 202.



275. The *last* of a group of slurred notes is always short, by virtue of its position.

276. When the slur is placed over two or more notes of the *same* name and pitch, it is called a *tie* or *bind*, and has the effect of turning them into one note—equal in length to the two added together. (*Compare Par.* 198.)

Figs. 203 and 204 are identical.

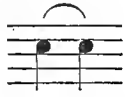
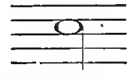
Fig. 203. 

Fig. 204. 

277. The tie is generally used to connect *two* notes, the *first* of which is *un*accented, and, more especially, the *last* note of one measure with the *first* of another. Sounds beginning on *accented* beats are generally expressed by entire notes, or by dotted notes.

The form in fig. 205 (*Compare par.* 180) is now obsolete, that in fig. 206 having superseded it. Fig. 207, however, is not incorrect, though more often written as fig. 208.

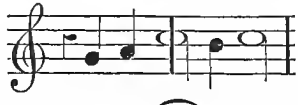
Fig. 205. 

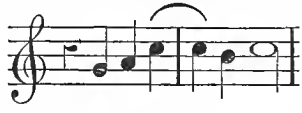
Fig. 206. 

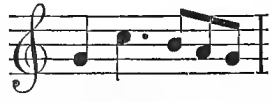
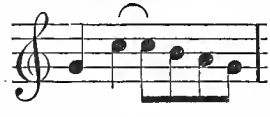
Fig. 207. 

Fig. 208. 

278. In prolonging a note begun on an *un*accented beat to an accented beat, "the natural and ordinary accent" of the measure in which it appears "is disturbed." (*Par.* 180.) The result of this disturbance is called *syncopation.* Syncopation is rendered more apparent by the employment of the sign $\gtrdot$, or the letters *Sz.* (*See Fig.* 211.)

CHAPTER XXVII.

Words relating to Pace, Intensity, and Style.

279. The vocabulary of music has been enriched, or corrupted, by the contributions of every people among whom musical composers, performers, or even transcribers, have been found. *Lively, Doucement, Feierlich,* &c. &c., are used severally to indicate the pace, intensity, or style, of music printed in England, in France, or in Germany.

280. These words carry with them the disadvantage of being intelligible only to the people of those countries, or to those who have studied their language,—a disadvantage the more to be deprecated from the fact that musicians possess a sort of *common* language in Italian, the *musical terminology* of which is more or less accepted by every musical people.

A complete list of Italian words relating to pace, intensity, and style, would furnish material for a Musical Dictionary. The following lists contain some of the most important, classed under their several heads. The English words immediately following the Italian are such *literal* translations as would be found in a dictionary. They represent very imperfectly the meanings of the latter as applied to music, which indeed are only to be ascertained from a close study of Italian, or considerable experience in musical performance. Thus, *Grave, Lento,* and *Largo,* may be regarded as equivalents, so far as *pace* only is concerned; but each indicates a different *style* of performance,—*Grave* implying more solemnity than *Lento,* and *Largo* more dignity or *breadth* than either.

281. Words relating to pace, intensity, and style, admit in every instance of *contraction,* and generally of modification, by the *augmentation* or *diminution* for which the Italian language presents such facility. Sometimes two or more are joined together in a way that appears somewhat contradictory, until it is understood that they refer not *only* to pace, but to *style* also. Thus, *Allegro Andante* means lively in *manner,* but somewhat deliberate in *pace.*

Each of the words in fig. 209, excepting the three first, may be considered to express a quicker movement than the one before it.

Fig. 209.

Words relating to Pace.

GRAVE, *grave.*
LENTO, *slow.*
LARGO, *broad.*
LARGHETTO, *rather broad, not so slow as* LARGO.
ADAGISSIMO, *very leisurely, slower than* ADAGIO.
ADAGIO, *leisurely.*
ANDANTINO, *going gently, slower than* ANDANTE.
ANDANTE, *going at a moderate pace.*
ALLEGRETTO, *rather merry, not so fast as* ALLEGRO.
ALLEGRO, *merry, lively.*
PRESTO, *quick.*
PRESTISSIMO, very *quick.*

Connected with the above are the following:—

Fig. 210.

ACCELERANDO,* ACCEL°., *accelerating* (*the pace*).
RALLENTANDO,* RALL°., *slackening* (——).
STRINGENDO, STRIN°., *pressing onwards.*
PIÙ MOSSO, *more moved, quicker.*
RITARDANDO, RITAR°., *retarding.*
RITENUTO, RITEN°., *holding back.*
A TEMPO, *in time,* (*after an* ACCEL°. *or* RALL°.).
IN ISTESSO TEMPO, *in the same time; i. e., the times, or* beats, *the same, whatever be the* forms *of the notes.*
ALLA BREVE, *by the breve; i. e., the breve being regarded as the* whole note—*each* beat *being a* minim.
TEMPO ORDINARIO, (*in*) *ordinary time* } *neither fast nor slow.*
—— COMODO — *convenient* — }

* * These words are *correlatives.*

Modern composers frequently add to the words above, an *exact* indication of the pace of their music, by a reference to the Metronome. (*See Chap. XXIX.*)

Fig. 211.

Words relating to Intensity.

PIANO,* PIA., *p, soft.*
MEZZO PIANO, MEZ. PIA., *mp, rather soft.*
PIANISSIMO, PIAN^{mo}., *pp, very soft.*
FORTE,* FOR., *f, loud.*
MEZZO FORTE, MEZ. FOR., *mf, rather loud.*
FORTISSIMO, FOR^{mo}., *ff, very loud.*
CRESCENDO,† CRES., *or* <, *increasing* (*in loudness*).
DECRESCENDO,† DECRES., *or* >, *decreasing* (*in loudness*).

To the above may be added:

FORTE PIANO, *fp, loud and* (*immediately after*) *soft.*
SFORZATO, *sz, forced* (*applicable to single notes only*).
RINFORZANDO, RINFORZ., *forcing* (*applicable to passages*).
CALENDO, *descending* }
PERDENDOSI, *losing itself* } *decreasing in* speed *and*
DIMINUENDO, *diminishing* } (*generally*) *in intensity.*
SMORZANDO, *extinguishing* }
DOLCE, *soft.*

* † These and their dependent words are *correlatives.*

All these words are liable to modification by the addition of one or more others, expressive partly of pace, but more especially of style. The following are some of the most important of them:—

Fig. 212.

Words relating (chiefly) to Style.

AGITATO, agitated.	MAESTOSO, majestic.
ANIMATO, animated.	MARCATO, marked.
A POCO A POCO, by degrees.	MOLTO, much, very.
ASSAI, sufficiently.	MENO, less; *e. g.*, Meno Allegro.
BEN, well; *e. g.*, Ben Marcato.	MEZZO, half.
BRILLANTE, brilliant.	MODERATO, moderate.
CON, with.	NON, not; *e. g.*, Non troppo Lento.
(CON) BRIO, mirth.	PIÙ, more; *e. g.*, Piu Animato.
—— ESPRESSIONE, expression.	POCO, little.
—— FUOCO, fire.	QUASI, almost, as though.
—— MOTO, motion.	SEMPRE, always; *e. g.*, Sempre *pp*.
—— TENEREZZA, tenderness.	SOSTENUTO, sustained.
ESPRESSIVO, expressive.	STACCATO, cut off.
GIUSTO, exact.	TENUTO, held, sustained.
GRAZIOSO, graceful.	VIVACE, lively.
LEGATO, bound.	VOLTI, turn.
MA, but; *e. g.*, Ma non Rall°.	SEGUE, it follows.

282. The words in fig. 209 are all used occasionally as noun-substantives. We speak of *an* Adagio, *an* Andante, *an* Allegro—as of movements to be performed in the styles indicated by those words.

CHAPTER XXVIII.

The Tenor and Alto Staves.

"All the notes (twenty-three) required for *average* vocal music can be placed on a stave of *eleven* lines." (*Par.* 34.) But "no *individual* voice can utter" twenty-three sounds; consequently, in writing music for individual voices, a smaller number of lines suffices. "Practically, whether for vocal or instrumental music, a stave of *five* lines is generally adopted; the *particular sets*, or staves, most used being the five highest and the five lowest of the Great Stave" of eleven. (*Par.* 35.)

"The lower one of these sets, or staves, of five lines is used for voices and instruments of low pitch the upper, for voices or instruments of higher pitch." (*Par.* 36.) "Music for the *lower* voices of women and the *higher* voices of men *demands other staves*, which are, equally with the treble and bass staves, extracts from, or parts of, the Great Stave of eleven lines." (*Par.* 39.)

283. The voices of *men* (beginning from the lowest) are Bass, Barytone, Tenor, and Counter-tenor; those of women are Contralto, Mezzo-soprano, Soprano, and Treble. The *highest* of the former, the Counter-tenor, is almost identical in *compass* with, though very different in *timbre* from, the *lowest* of the latter, the Contralto. The Treble may be regarded rather as a *puerile* than a *female* voice.

The relative places, in the musical system, of these voices is exhibited in fig. 213, and the relations of the *different staves* they occupy to the Great Stave is shown in fig. 214.

Fig. 213.

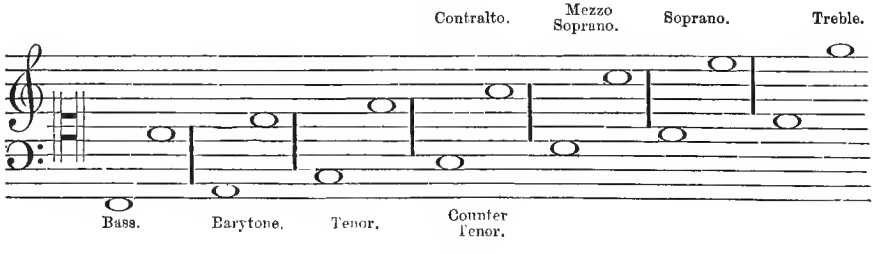
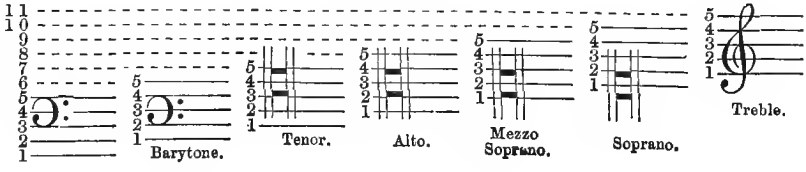


Fig. 214.



284. Of the seven staves (in fig. 214) *two* are headed by the F clef, *four* by the C clef, and *one* only by the G clef.

285. The 4th line of the Great Stave (indicated by the F clef), is also the 4th line of the *bass* stave; but it is the 3rd line of the *barytone* stave, the 2nd of the *tenor*, and the 1st of the *contralto*.

286. The 6th, or middle, line of the Great Stave (indicated by the C clef), which forms no part of the *bass* or of the *treble* stave, is the 5th line of the *barytone*, the 4th of the *tenor*, the 3rd of the *contralto*, the 2nn of the *mezzo soprano*, and the 1st of the *soprano*.

287. The 8th line of the Great Stave (indicated by the G clef), which forms no part of the *bass*, *barytone*, or *tenor* stave, is the 5th line of the *contralto* stave, the 4th of the *mezzo-soprano*, the 3rd of the *soprano*, and the 2nd of the *treble*.

288. Two of these staves, the *barytone* and the *mezzo-soprano*, have become obsolete. Music for the barytone *voice* is now commonly written on the *bass stave*; music for the mezzo-soprano voice, on the *contralto*, the *soprano*, and even the *treble* stave, which latter, in England, is generally substituted for the *soprano*.

The treble stave was once used exclusively for *instrumental* music, and has not even yet been *universally* adopted for vocal. The soprano stave is still much used on the Continent.

289. Thus the staves in actual use are but five, and, in England, only four,—the *bass* and *tenor* for the voices of men, the *contralto* (or *alto*) and *treble* for the voices of women and children.

The bass and treble staves, the lowest and the highest of the Great Stave of eleven lines (*see Chap. IV.*), can need no further explanation.

290. On the 4th line of the *tenor* stave is found the C clef. (*See fig.* 214.) The C clef, it will be remembered, is the distinguishing mark of the 6th, or *middle*, line of the Great Stave of eleven lines. Consequently, the 4th line of the *tenor* stave is identical with the 6th of the Great Stave; and, further, the 1st, 2nd, 3rd, and 5th lines of the former are identical with the 3rd, 4th, 5th, and 7th of the latter.

291. On the 3rd line of the *contralto* stave (*See fig.* 214) is found the C clef—the distinguishing mark of the 6th or middle line of the Great Stave. Consequently, the 3rd line of the *contralto* stave is identical with the 6th of the Great Stave; and further, the 1st, 2nd, 4th, and 5th lines of the former with the 4th, 5th, 7th, and 8th lines of the latter.

Familiarity with the tenor and contralto staves is only to be attained by practice; but it is certain that the difficulty sometimes attendant on this arises entirely from the fact that their *relation* to the Great Stave, and therefore to the more familiar *treble* and *bass* staves, is not at all, or but imperfectly, understood. One stave is of course, *of itself*, as easily mastered as another; and any difficulty found in reading from the tenor and alto staves must arise from a hitherto exclusive use of the treble and bass.

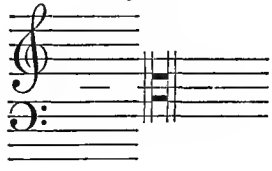
Let the following facts be borne in mind:—

292. The 1st, 2nd, 3rd lines of the *tenor* stave are identical with the 3rd, 4th, and 5th of the *bass;* the *top* line of the *tenor* stave is identical with the *bottom* line of the *treble;* and the 4th (or clef) line of the *tenor* stave is that *leger* line which connects the bass with the treble. (*Fig.* 215.)

293 The 1st and 2nd lines of the *contralto* stave are identical with the 4th and 5th of the bass; the 4th and 5th lines of the *contralto* stave with the 1st and 2nd of the *treble;* and the 3rd (or elef) line of the *contralto* stave is identical with the *leger* line connecting the bass with the treble. (*Fig.* 216.)

Fig. 215.

Fig. 216.



The student must be warned that, notwithstanding the recent multiplication of editions of popular musical works, in which parts for the alto and tenor voices are printed on the treble stave (the former sometimes, and the latter always, an octave higher than their proper pitch), anything like an extensive acquaintance with classical music is quite impossible without familiarity with the alto, tenor, and soprano staves.

CHAPTER XXIX.

The Syren and The Metronome.

294. "The pitch of a musical sound depends on the *number* of vibrations communicated to the air *in a given time*" (*Par.* 5),—its duration, "on the time during which the air continued to vibrate *at the same pace*." (*Par.* 6.)

295. Although "the musical student is chiefly concerned with the pitch and duration of sounds as compared with one another," yet, "every sound is assuredly of a *definite* and *appreciable* pitch and duration." (*Par.* 9.)

296. C, the centre of the musical system (*Par.* 30), is the result of 256 vibrations *per* second; its octave above, of 512; and its octave below, of 128. The highest C on an ordinary Piano-forte is the result of 2048 vibrations *per* second; the lowest C, of 32. The octave below the latter, the result of 16 vibrations *per* second, has till lately been thought to be the lowest sound appreciable by the human ear.

297. It is difficult to believe that even the lowest of these numbers is to be *counted*; yet methods whereby their correctness could be ascertained *indirectly* have been known for a great length of time; and mechanical science has recently made even a *direct* estimation of it possible. The most perfect of these contrivances is an instrument called the *Syren*, invented by a French mathematician, Cagniard de la Tour.

298. The Syren (*see fig.* 218) consists of cylinder A, generally about 2 inches long and 3 inches in diameter, the *table*, or top, of which is pierced with 25 holes placed in a circle at equal distances apart. In immediate contact with this table is placed a *disk* B, about $1\frac{1}{2}$ inch in diameter, pierced with the same number of holes as, and exactly coinciding with, those in the table of the cylinder. By means of a short pipe C, communicating with a bellows, a blast of air, slightly compressed, is forced into the cylinder, from which its only means of escape is through the holes in the top of it, *when those of the disk are brought immediately over them*. The holes of the disk and of the cylinder being cut obliquely and in opposite directions, the air, in its effort to escape from the latter, sets the former spinning, and brings each of the holes of the one successively over each of those of the other. Every time this happens, the compressed air, in its escape from the cylinder, gives a pulsation to the external air, which pulsation, if repeated at regular intervals and with sufficient rapidity, produces necessarily a *musical sound*.

299. "As the number of vibrations (or pulsations) communicated to the air in a given time increases or diminishes, so does the sound become more acute or more grave." (*Par.* 5.) In the case of the Syren, the *number* of vibrations will depend on the *pace* at which the disk revolves,—which pace, again, depends on the force with which the air is driven into the cylinder.

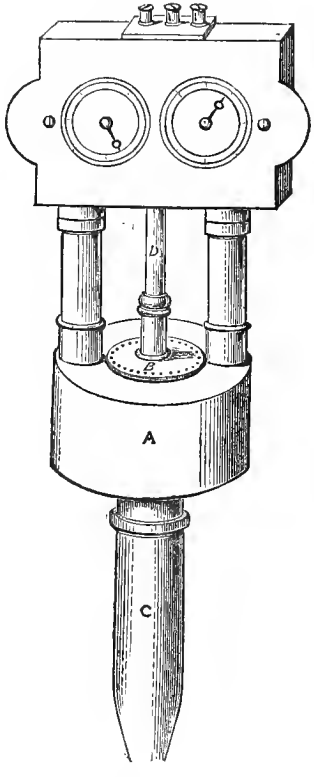
300. The number of revolutions, and portions of revolutions, made by the disk, are recorded by two hands, somewhat similar to those of a watch, each being centred on a separate dial, and acted upon by a mechanical contrivance which connects them with the axis of the disk D; the *time* in which these revolutions are made being ascertained by a stop-watch, or a pendulum beating seconds.

Thus, supposing 5 revolutions of the disk to be made in a second while a note of a given pitch was maintained, it would prove that that note (*e. g.*, *fig.* 217) was the result of 125 vibrations *per* second; seeing that, the disk being pierced with 25 holes, each revolution of it was the cause of 25 vibrations.

Fig. 217.

Fig. 218.

THE SYREN.



The application of the Syren to practical music is at present too remote to justify a more minute account of it here. The exact measurement of the *time* of sounds is at once more simple, and practically more important to the student, than that of their *tune*. This is effected by means of Maelzel's *Metronome*.

301. Maelzel's Metronome (*fig.* 219) consists of a pendulum A B, having an index B C, which is furnished with a weight M, easily moveable along its whole length. On the position of M depends the *pace* at which the pendulum A B will oscillate to and fro, or, more properly, the *number* of oscillations it will make *in a given time*. The figures on the index B C indicate this number *per minute*, supposing the moveable weight M to be placed immediately *under* any one of them.

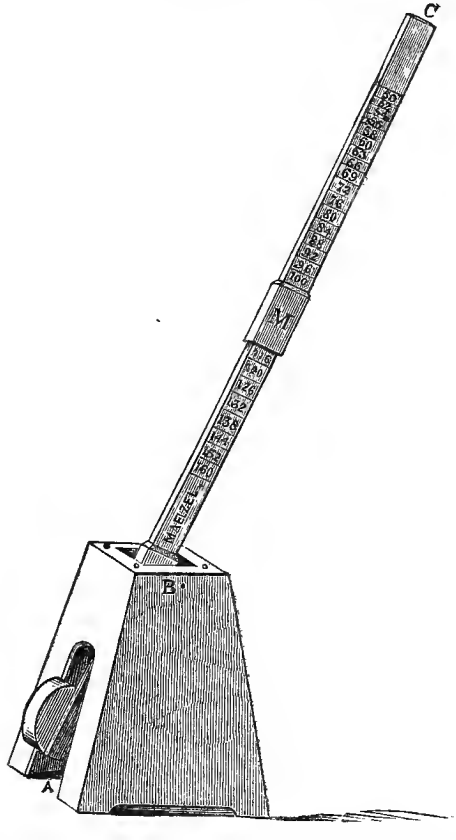
Thus, if the top of M be placed against the line marked 160, the pendulum A B, and the index B C, will make 160 vibrations *per* minute: if it be placed against the line 50, it will make 50 vibrations *per* minute; the former being the largest, the latter the smallest, number possible.

302. A composer or editor, who desires to indicate the *exact time* at which a given movement is to be performed, has only to mark against the form of note which represents each beat the figure under which the weight M is to be placed on the index B C, and the pendulum will oscillate at the pace at which each beat is to be made.

Thus ♩ = 100, means that each crotchet is to be performed, and each beat (equal to a crotchet) made, in the time of one oscillation of the pendulum, when M is placed against the line marked 100.

Fig. 219.

THE METRONOME.



Although, for the purpose of *keeping* time in musical performance, the Metronome never has been nor perhaps ever can be used, for the purpose of *indicating* it, it is most valuable. When at hand it is, of course, an indisputable evidence of the intention of the composer; and even when no at hand it is hardly less useful, since a moderate degree of practice will enable a conductor, or performer, to *remember* the pace at which the pendulum vibrates when the weight is in this or that position, and thus to carry out the design of the composer, if not perfectly, at least with far more certainty than when aided only by such words as *Andante, Allegro,* &c. &c.

CHAPTER XXX.

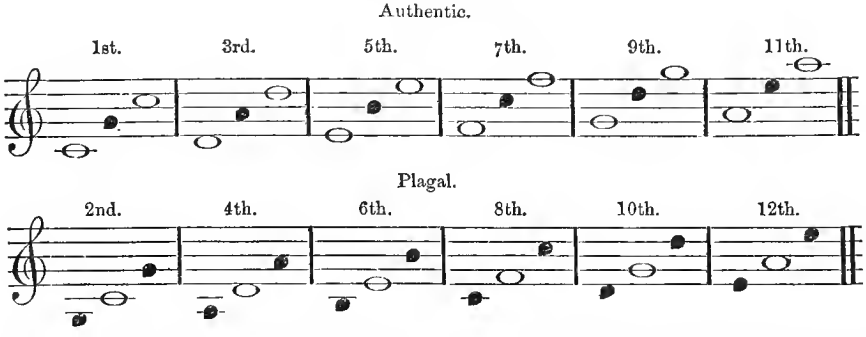
The Ancient Modes.

"The order of tones and semitones in a scale is called a *mode*. Seven modes, or forms, of scale are therefore possible; and at least that number was once *in use*." (*Par.* 76.)

303. It has been shown (*in Chap. VII.*) that of the seven modes "possible" only two are available, or have hitherto been made available, in the modern system—the 1st and the 6th (*of fig.* 40); that the 2nd, 3rd, and 5th have been rejected because they are wanting in *leading notes*, and the 4th because of its *plusperfect* fourth; and that the 7th "has never been used," on account of its *imperfect* fifth.

304. The importance of the leading note, though not altogether unappreciated, would seem to have been less sensibly felt by the Old Masters than by us; for they certainly recognised and executed music written in the 2nd, 3rd, and 5th modes (*of fig.* 40), and, by a different disposition of the notes of each, formed as many others—in all *twelve*.

Fig. 220.—The Ancient Modes.



305. The first six of these modes (those in the *upper* line of fig. 220) they called *authentic*, the others (those in the *lower* line) they called *plagal;* giving the *odd* numbers to the former and the *even* numbers to the latter.

By the "Old Masters" are generally understood the composers who flourished before the *end* of the *sixteenth* century; though the ancient *style* was maintained in many instances much later.

The large notes in fig. 220 are the tonics, or rather *finals*, of each mode.

306. The final of each authentic mode is *identical* with that of its plagal; *e.g.*, D, *not* A, is the final of the 4th mode as well as of the 3rd. A passage in an *authentic* mode, therefore, would range between the final and its octave; whereas a passage in a plagal mode would range between the 5th of the final and *its* octave; the final being, in an authentic mode, a *boundary*, and in a plagal mode, a *centre*.

307. Of these twelve "possible" modes only a certain number have been in common use at any time. Most of the old Theorists limited the number of modes to *eight*, four authentic and four plagal, counting the authentic mode whose final is D as the 1st, and the plagal mode whose final is G as the 8th, and *last*; thus rejecting *the only two* used in the modern system — those beginning on C and A.

The arrangement of fig. 220 is that given by Zarlino in his "Instituzioni Armoniche;" but the one most commonly adopted was the following. (*See fig.* 221.)

Fig. 221.—THE ANCIENT MODES.

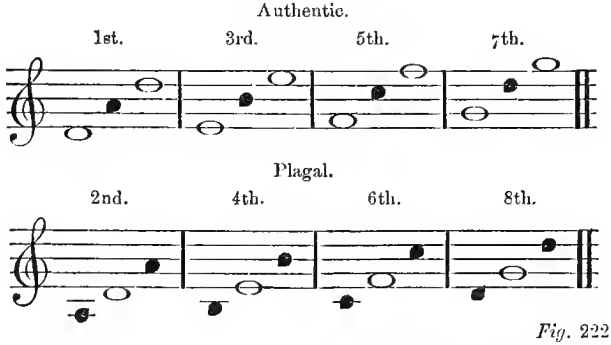


Fig. 222.

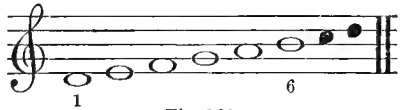


Fig. 223.

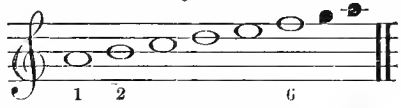
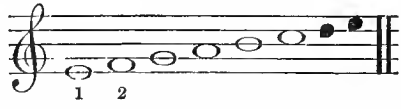


Fig. 224.



308. Of the above, the modes most commonly used were the 1st and 3rd, whose finals are D and E. (*Figs.* 222 *and* 224.) They are both *minor* modes, but differing from the modern type (*fig.* 223), the former in its *major* 6th, the latter in its *minor* 2nd. (*Compare figs.* 222 *and* 224 *with fig.* 223.)

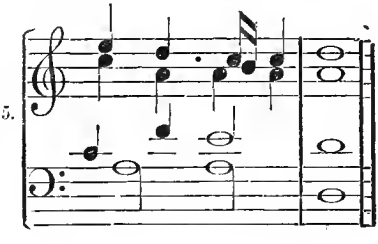
Two of the most recent examples of the use of these modes are presented in Handel's *Israel in Egypt*,—of the 1st in the chorus, "And I will exalt Him," and of the 3rd in "Egypt was glad."

309. The old modes were liable to *modifications*, akin to those *now* made in the upper tetrachord of the minor scale. (*Par.* 146.) Thus the 4th sound (B) of the 5th mode, which is a *plu*perfect fourth from the final F, was often made *flat*,—by which means the mode became identical with the modern major scale of F. While in progressions like the last of the soprano part of fig. 225, the penultimate note was *sung*, though not written, *sharp*.

G. PORTA.

Until a comparatively recent period, such modifications as the above were left to the science or taste of the *performer*, who would, of course, often have anticipated many of the effects of modern tonality.

Fig. 225.



310. The Old Masters were acquainted with *transposition*; but they never carried it (in writing) into scales requiring more than *one* sharp, or *one* flat; and it was only recently that even these were placed *at the head* of the stave. When the growing needs of the modern system called more than one sharp or flat into requisition, *scale signatures* were introduced—though at first in an imperfect form. So lately as the beginning of the eighteenth century, the *last* sharp, or flat, was commonly marked as an *accidental*.

The signature of Handel's *trio*, "The flocks shall leave the mountains" (in *Acis and Galatea*), is *two* flats instead of three. The scale is that of C *minor*.

311. The tonic of a piece of *ancient* music can only be ascertained by examination of the music itself; nor can the signature *always* be relied on in respect to any piece composed before the modern system was thoroughly established.

APPENDIX.

The imperfections of the time-table, though eventually remediable by an act of memory, are the cause of perpetual embarrassment to beginners—especially those who bring any mathematical training to bear on the study of practical music.

Those only who have had experience of it can quite estimate the difficulty of making a mathematical student believe, or understand, that a quantity represented by $\frac{6}{8}$ has properties essentially different from a quantity represented by $\frac{3}{4}$, and that six quavers represented by the former sign are to be treated altogether differently from six quavers represented by the latter.

The following modes of designating compound times are suggested, not in the expectation of altering anything so extensively used and accepted as the existing time-table, but as a means of explaining the nature of compound times.

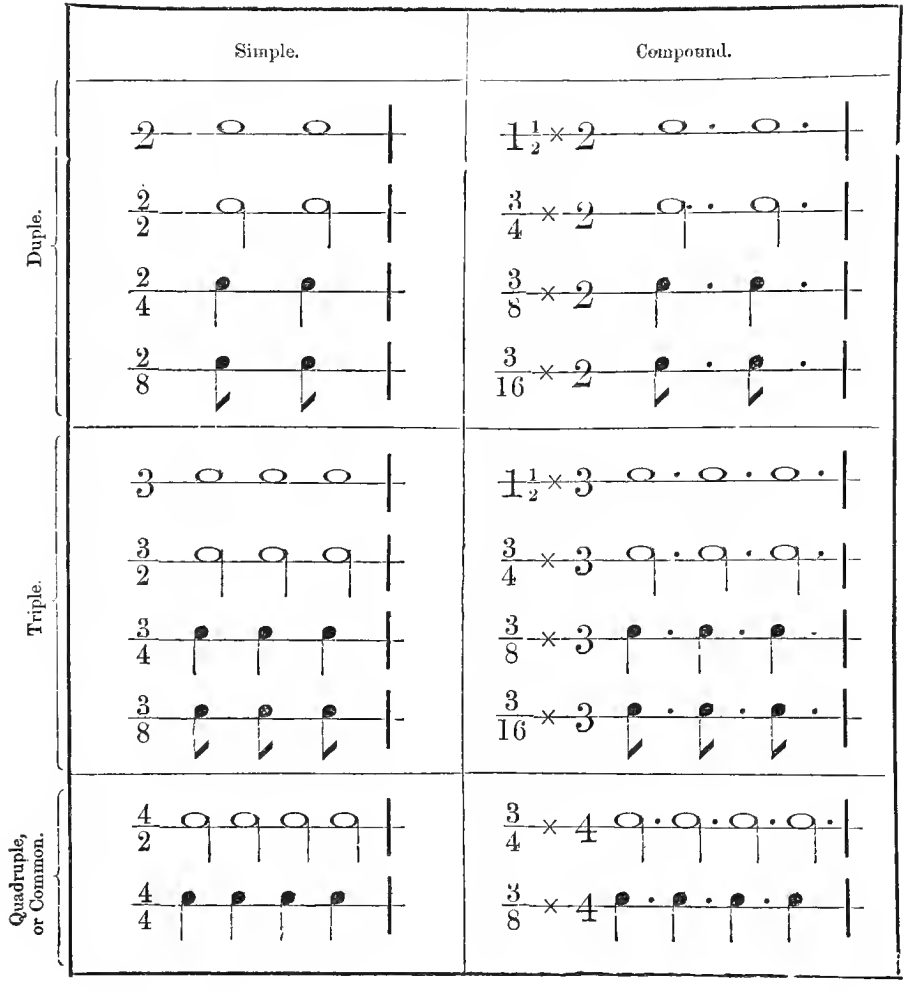
A measure of *compound duple* time differs from a measure of *simple triple* time in the fact, that whereas the latter consists of *three entire* notes (*e. g.*, crotchets), the former consists of *two dotted* notes (*e. g.*, dotted crotchets); the *amount* in either being the same, but the accent being essentially different. (*Compare Par.* 195.) A symbol which would represent *two* qualities, *each* consisting of *one and a half*, as distinguished from *three* qualities, *each* consisting of *one*, would seem to be a certain means of preventing these two kinds of time from being confounded, which, it is certain, the present signatures do not.

It is proposed, then, to mark all compound times on a uniform system, which would at once show the number of beats in a measure and the value of each beat,—the former by a fraction (of a semibreve) and the latter by a figure preceded by the common arithmetical *symbol of multiplication.*

Thus the time usually marked $\frac{6}{8}$ would be expressed by $\frac{3}{8} \times 2$; *i. e.*, three-eighths of a semibreve multiplied by two, or, in familiar language, *three quavers twice over*, in each measure.

The signatures in the left-hand column of the following table are identical with those in fig. 127; those on the right are, one and all, different. (*Compare fig.* 127.)

Proposed new Table of Time Signatures.



INDEX.

The numbers refer to the Paragraphs, which form an uninterrupted series from the beginning to the end of the work.

THE END.

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