ascending

Hughes

The twelve keys, their trinities, scales, and chords, rising seven times through seven octaves, each thirteenth note octave of the previous twelve and first of the rising twelve
—Descending, **ascending** reversed
—Keys mingled
—The Pendulograph alluded to, . . . 28 [Harmonies of Tones and Colours, Table of Contents2 - Harmonies]

The same laws, developing the minor scales, show that the **ascending** and descending scales vary from the harmony of the key-note and its trinities
—Each key developing three harmonies
—The tenth note of a minor scale modulates into a higher key, ... 36 [Harmonies of Tones and Colours, Table of Contents3 - Harmonies]

There is amazing grandeur, united with simplicity, in the working of Nature's laws in the development of harmonies of sound, so that the smallest conceivable point has its complementary and corresponding gradation, which renders it capable of development into its peculiar harmony, causing the "multequivalency of harmonies" in endless variety, whether veering round, to and fro, **ascending** or descending, or advancing and retiring in musical clef. [Harmonies of Tones and Colours, Dr. Gauntletts Remarks1, page 13]

Of course, true Art cannot be opposed to Nature, although all the rules of the musician are not the facts of Nature. Music, pure, natural, and harmonical, in the true and evident sense of the term, is the division of any key-note, or starting-point, into its integral and ultimate parts, and the descending divisions will always answer to the **ascending**, having reference to a general whole. The essence and mystery in the development of harmonies consist in the fact that every key-note, or unit, is a nucleus including the past, the present, and the future, having in itself an inherent power, with a tendency to expand and contract. In the natural system, as each series rises, its contents expand and fall back to the original limit from any point **ascending** or descending; we cannot perceive finality in any ultimate; every tone is related to higher and lower tones, and must be a part of an organised whole. It is well known how deeply the late Sir John Herschel studied this subject; and it was his opinion that there was some principle in the science of music which had yet to be discovered.[Harmonies of Tones and Colours, The Method of Development or Creation of Harmonies2, page 16]

If the laws which I shall endeavour to explain develope the twelve major harmonies, with each note in succession expanding its six tones from within itself; and if each of these is found to be a lower development, which leads the ear to a corresponding higher expansion of the twelve major key-notes, and the six tones of each **ascending** and descending in an unbroken sequence from any twelve consecutively, the thirteenth being the octave of the first, which commences a higher or a lower series; and if the twelve minor harmonies are also gained by the same laws from their twelve relative key-notes (the thirteenth again being octave): if, again, all other notes are shown to be but higher or lower repetitions of these twenty-four harmonies—may we not consider the problem as in some measure solved? especially as the harmonies proceed in geometric as well as harmonical ratio, and an accurate parallel can be traced between the development of notes and colours, which latter correspond with all the intricacies of harmonic sounds. [Harmonies of Tones and Colours, The Method of Development or Creation of Harmonies3, page 17]

suspected. Let us take as our standard of colours the series given by the disintegration of white light, the so-called spectrum: as our standard of musical notes, let us take the natural or diatonic scale. We may justly compare the two, for the former embraces all possible gradations of simple colours, and the latter a similar gradation of notes of varying pitch. Further, the succession of colours in the spectrum is perfectly harmonious to the eye. Their invariable order is— red, orange, yellow, green, blue, indigo, and violet; any other arrangement of the colours is less enjoyable. Likewise, the succession of notes in the scale is the most agreeable that can be found. The order is—C, D, E, F, G, A, B; any attempt to **ascend** or descend the entire scale by another order is disagreeable. The order of colours given in the spectrum is exactly the order of luminous wave-lengths, decreasing from red to violet. The order of notes in the scale is also exactly the order of sonorous wave-lengths,

decreasing from C to B." [Harmonies of Tones and Colours, On Colours as Developed by the same Laws as Musical Harmonies2, page 19]

The fountain or life of musical harmonies and colours is E, or yellow; the root B, or ultra-violet: these being, in fact, tints and shades of white and black. **Ascending**, they partake more of white; descending, of black: the former drawing tones and colours higher, the latter lower. [Harmonies of Tones and Colours, On Colours as Developed by the same Laws as Musical Harmonies2, page 19]

The tones between the seven white notes of keyed instruments, and the tints and shades between the seven colours, cause the multequivalency of colours and of tones; consequently every colour, as every musical harmony, has the capability of **ascending** or descending, to and fro in circles, or advancing and retiring in musical clef. It is a curious coincidence that Wünsch, nearly one hundred years ago, believed in his discovery of the primary colours to be red, green, and violet; and in this scheme, red, answering to the note C, must necessarily be the first visible colour, followed by green and violet, but these not as primary colours, all colours in turn becoming primaries and secondaries in the development of the various harmonies. To gain facts by experiment, the colours must be exactly according to natural proportions—certain proportions producing white, and others black. In this scheme, green and red are shown to be a complementary pair, and therefore (as Clerk Maxwell has proved) red and green in right proportions would produce yellow. The same fact has been proved in Lord Rayleigh's experiments with the spectroscope. Yellow and ultra-violet, [Harmonies of Tones and Colours, On Colours as Developed by the same Laws as Musical Harmonies3, page 20]

A key-note developing its harmony may be compared to a seed striking its root downwards, and rising upwards. On striking a note, it sounds from within itself, in a rapid and subdued manner, the six kindred tones necessary to its harmony, and all which do not belong to that individual harmony are kept under; thus all harmonies are in sevens. Each seven forms an **ascending** and descending series; the ear is aware of the tones, but not of the order in which they rise. [Harmonies of Tones and Colours, Diagram II - The Twelve Keynotes1, page 23]

We here trace the twelve harmonies developing in succession. Notice how exactly they all agree in their mode of development; also the use of the chasms between E and F, B and C. Remark also the beautiful results from the working of the double tones, especially C#-D?, and E#-F?, causing the seven tones of each harmony, when **ascending**, to rise one tone, and, descending, to reverse this movement. F#-G? is the only double tone which acts as F# when a key-tone, and G? when the root of D?. The root of each harmony is the sixth and highest tone in each succeeding harmony, rising one octave; when it is a double tone, it sounds according to the necessity of the harmony. The intermediate tones are here coloured, showing gradual modulation. The isolated fourths (sounding sevenths) were the previously developed key-tones; these also alter when they are double tones, according to the necessity of the harmony. Beginning with B, the isolated fourth in the harmony of C, the tones sound the twelve notes of a keyed instrument, E# being F?, and the double tones, some flats, some sharps. [Harmonies of Tones and Colours, Combinations of dissonance, rests, page 24]

THE term "key" will now be employed in the ordinary sense of the musician, as a note which keeps all those other notes under subjection which do not belong to its harmony. A good ear requires that the first note struck should govern and regulate the rest, carrying on the intricacies of the key through the seven octaves **ascending** and descending. [Harmonies of Tones and Colours, Diagram IV - The Development of the Twelve Major Scales, page 26a]

The twelve key-notes, with the six notes of each as they veer round in trinities, are again written in musical clef, and the scales added. The key-note leads the scale, and, after striking the two next highest notes of the seven of the harmony, goes forward, with its four lowest, an octave higher. The seven of each harmony have been traced as the three lowest, thus meeting the three highest in three pairs, the fourth note being isolated. Notwithstanding the curious reversal of the three and four of the scale, the three lowest pair with the three highest, and the fourth with its octave. The four pairs are written at the end of each line, and it will be seen how exactly they all agree in their mode of development. Keys with sharps and keys with flats are all mingled in twelve successive notes. If we strike the twelve scales **ascending** as they follow each other, each thirteenth note being octave of the first note of the twelve that have developed, and first of the rising series, the seventh time the scales gradually rise into the higher series of seven octaves beyond the power of the instrument.

Descending is **ascending** reversed. After the seven and octave of a scale have been sounded ascending, the ear seems to lead to the descending; but ten notes of any scale may be struck without the necessity of modulation; at the seventh note we find that the eleventh note in the progression of harmonics rises to meet the seventh. For instance, B, the seventh note in the scale of C, must have F#. This point will be fully entered into when examining the meeting of fifths. To trace the scale of C veering round as an example for all, we may begin with C in Diagram II., and go forward with F, G, A, and B an octave higher. If the twelve scales were traced veering round, they would be found to correspond with the twelve as written in musical clef. [Harmonies of Tones and Colours, Diagram IV - The Development of the Twelve Major Scales, page 26a]

If the chords of the twelve keys and the thirteenth octave are struck, all agree in their method of development. We see here the order in which the chords are repeated, and the working of the double tones. As an example of the latter, we may trace the chords belonging to the key of D?, and compare them with those belonging to the key of F#, also the first chord in the key of A?. The fourth note in depth, sounded last of the seven of each harmony, has been seen as preparing for the chords; it prepares equally for the scale, and the scale for the chords, the octave chord of the scale, **ascending**, preparing for the latter to descend. Descending is **ascending** reversed. [Harmonies of Tones and Colours, Diagram V - The Chords of the Twelve Major Keys, page 27a]

CHAPTER IX.

DIAGRAM VI.—THE TWELVE KEYS **RISING** SEVEN TIMES THROUGH SEVEN OCTAVES, AND FALLING BACK AGAIN.

"Painting has been called silent Poetry; Poetry, speaking Painting; and Architecture, frozen Harmony. The laws of each are convertible into the laws of every other."
[Harmonies of Tones and Colours, The Twelve Keys Rising Seven Times, page 28a]

IF we strike the twelve keys of harmonies in trinities, scales, and chords, as written in musical clef, beginning with the lowest C in the bass clef, this first development is linked into the lower series of seven octaves by the four lower tones sounded by C. If we follow with the twelve keys six times, at the seventh time they will gradually **rise** into the higher series. We obtain a glimpse of the beauty arising from musical notes in the Pendulograph. How exquisite would they be if they could be represented in their natural coloured tones! — as, for instance, the chord of the scale of C in red, yellow, and blue, with the six coloured tones **rising** from each, and harmoniously blended into each other. [Harmonies of Tones and Colours, The Twelve Keys Rising Seven Times, page 28a]

The 12 Key-notes and their trinities and scales written in musical clef, with their chords added, all **rising** in the two octaves, as before. [Harmonies of Tones and Colours, The 12 Keynotes and Their Trinities and Scales, page 28c]

DIAGRAM VII.—THE MODULATING GAMUT OF THE TWELVE KEYS MEETING BY FIFTHS, ADVANCING OR RETIRING IN MUSICAL CLEF THROUGH SEVEN OCTAVES, AND VEERING ROUND, **ASCENDING** AND DESCENDING THROUGH SEVEN CIRCLES.

[Harmonies of Tones and Colours, Diagram VII - The Modulating Gamut of the Twelve Keys1, page 29]

THE twelve keys have been traced following each other seven times through seven octaves, the keys mingled, the thirteenth note being the octave, and becoming first of each rising twelve. Thus developing, the seven notes of each eighth key were complementary pairs, with the seven notes of each eighth key below, and one series of the twelve keys may be traced, all meeting in succession, not mingled. When the notes not required for each of the twelve thus meeting are kept under, the eighths of the twelve all meet by fifths, and as before, in succession, each key increases by one sharp, the keys with flats following, each decreasing by one flat; after this, the octave of the first C would follow and begin a higher series. It is most interesting to trace the fourths, no longer isolated, but meeting each other, having risen through the progression of the keys to higher harmonies. In the seven of C, B is the isolated fourth, meeting F#, the isolated fourth in the key of G, and so on. Each **ascending** key-note becomes the root of the fifth key-note higher; thus C becomes the root of G, &c.
[Harmonies of Tones and Colours, Diagram VII - The Modulating Gamut of the Twelve Keys1, page 29]

In the retrogression of harmonies, a key-note and its trinities, by sounding the same tones as when **ascending**,

leads the ear to the same notes, and the root of each key-note becomes the fifth lower key-note. F, the root of C, becomes key-note; B?, the root of F, the next key-note, and so on. [Harmonies of Tones and Colours, Diagram VII - The Modulating Gamut of the Twelve Keys1, page 29]

The following table shows the regularity of each seven of the twelve key-notes **ascending** by fifths, and the use of the two poles is again seen. The key-notes and their trinities are closely linked into each other, the three highest notes of the lower fifth key becoming the three lowest of the higher fifth key, and the four lowest becoming the four highest in an octave higher. The twelve keys, rising in each note a tone higher and descending a tone lower, cause the meetings by fifths. Having examined the table, we may strike the keys by fifths as written in the musical clef, beginning with the lowest C in [Harmonies of Tones and Colours, Diagram VII - The Modulating Gamut of the Twelve Keys1, page 29]

the bass clef, carrying each key-note a fifth higher or descending a fifth lower. A constant difficulty arises in explaining the development of tones and colours, from the fact that the **ascending** notes on a keyed instrument are descending lines in musical clef, and the **ascending** lines in musical clef in the retrogression of fifths must be gained by beginning below and following them upwards. They are therefore not repeated, either in the table or in musical clef, as descending. [Harmonies of Tones and Colours, Diagram VII - The Modulating Gamut of the Twelve Keys2, page 30]

In the development of the key-notes, the sharp or flat is written to each note, but not to the keys. The reversal of the three and four notes of each seven of the twelve key-notes and their trinities meeting by fifths having been traced, we will now examine the twelve scales meeting by fifths, and the results arising from the reversal of the three and four notes of each fifth lower scale in the fifth higher. Take as an example the scale of C: C D E F G A B, and that of G: G A B C D E F#. The four lowest notes of the seven of C are the four highest, an octave higher, in G; F, the central and isolated note of the seven of C, having risen a tone higher than the octave in the scale of G. The twelve scales thus modulate into each other by fifths, which sound the same harmonies as the key-notes and their trinities. Refer to the twelve scales written in musical clef **ascending** by fifths, and strike them, beginning at the lowest C in the bass clef; this scale sounds no intermediate tones, but these must be struck as required for all the scales to run on in fifths. After striking the seven notes of C, if we fall back three, and repeat them with the next four notes of the seven; or strike the seven and octave of C, and fall back four, repeating them and striking the next four, the four last notes of each scale will be found to be always in the harmony of the four first of the fifth higher scale. When the twelve scales **ascending** have been thus gained, as we trace them also on the table, they may be struck descending by following them as written in musical clef **upwards**, and [Harmonies of Tones and Colours, Diagram VII - The Modulating Gamut of the Twelve Keys2, page 30]

may be traced in the same way on the table; the third and seventh notes meeting, **ascending** and descending, sounding one harmony. [Harmonies of Tones and Colours, The Twelve Scales Meeting by Fifths, page 31a]

Finally, trace the twelve keys by fifths as they veer round through the seven circles, each circle representing the eighteen tones. Beginning with C in the innermost circle **ascending**, C becomes the root of G, G of D, and so on. In descending, begin with C in the outermost circle (though really the first of a higher series which we have not the power of striking on instruments); F, its root, becomes the key-note, B? the root and then the key-note, and so on. The keys thus gained are written in musical clef below. [Harmonies of Tones and Colours, The Twelve Scales Meeting by Fifths, page 31a]

The 12 Major Keys meeting by fifths through 7 octaves; strike each Key-note, as having risen a fifth higher **ascending**, and fallen a fifth lower descending. [Harmonies of Tones and Colours, The 12 Major Keys Meeting by Fifths, page 31c]

Ascending, begin with C in the innermost circle, F being its root. The Key-note C becomes the root of G, G becomes the root of D, and so on. In descending, begin with the octave Key-note C in the outermost circle. F, the root of C, becomes the fifth lower Key-note. F is the next Key-note, and becomes the root of B?, &c. The 12 Keys in their order are written in musical clef below. Lastly, the Keys of C and G, **ascending** on a keyed instrument, are written in music as descending; therefore, to shew correctly notes and colours meeting, it is necessary to reverse them, and write C below G. All are seen to be complementary pairs in tones and colours. [Harmonies of

Tones and Colours, Diagram VII Continued2, page 31e]

THE term "key" in the minor developments must be taken in the sense in which it is understood by musicians, although it will be seen that it is only the seven of the harmony that are the relative minor keys of the majors, the scales with their chords sounding other keys. The grandeur, combined with simplicity, of the laws which develope musical harmonies are strikingly exhibited in the minor keys. Although at first they appear most paradoxical, and, comparing them with the majors, we may almost say contradictory in their laws of development, when they are in some degree understood, the intricacies disappear, and the twelve keys follow each other (with the thirteenth octave), all exactly agreeing in their mode of development. I shall endeavour to trace them as much as possible in the same manner as the majors, the lowest developments of the minor keys being notes with scales and chords, the notes always sounding their major harmonies in tones. Here an apparently paradoxical question arises. If the major keys are gained by the notes sounding the major tones, how are the minor keys obtained? Strictly speaking, there are no minor key-notes: the development of a minor harmony is but a mode of succession within the octave, caused by each minor key-note employing the sharps or flats of the fourth major key-note higher; and with this essential difference, it will be seen in how many points the developments of major and minor harmonics agree. I have carefully followed the same laws, and if any capable mind examines the results, I am prepared for severe criticism. I can only express that it was impossible to gain any other results than the seven of the harmony, the **ascending** and the descending scale and the chords combining three different keys. [Harmonies of Tones and Colours, Diagram VIII - On the Development of the Twelve Minor Harmonies, page 32]

When the twelve minor harmonies are traced developing in succession, we notice how exactly they all agree in their method of development, also the use of the chasms and the double tones, the seven of each harmony rising a tone when **ascending**, but reversing the movement in descending; keys with sharps and those with flats are mingled. The intermediate tones are here coloured, showing gradual modulation. D? is shown to be an imperfect minor harmony, and E?, by employing B as C?, is seen to be equivalent to D#. [Harmonies of Tones and Colours, Diagram IX - The Minor Keynote A and Its Six Notes, page 34a]

THE same laws are followed here as in the development of the major scales. In that of A, F, the sixth note, has risen to F#, in order to meet B, which has previously sounded. In descending, the seventh note, B, falls to B?, in order to meet F, which has also previously sounded. The notes, **ascending** or descending, always follow the harmony of their key-note, except when rising higher or falling lower to meet in fifths. We may here trace the twelve, the **ascending** scale sounding the fifth harmony higher than its key-note, and, in descending, sounding the fifth lower harmony. The four pairs of each scale are written at the end of the lines. If we strike the twelve scales as they follow in succession, the thirteenth note being the octave of the first, and leader of a higher twelve; having gained them six times, at the seventh they gradually rise (though beyond the power of a keyed instrument) into the higher series of seven octaves, and again, in descending, they fall lower, and are linked into the lower series of seven octaves. Nine notes of any **ascending** minor scale may be struck without the necessity of modulating beyond the fifth harmony. For example, in the scale of A, its tenth note, C#, rises to meet the sixth note, which has previously sounded. In descending, E?, the eleventh note, meets B?, the seventh note, which has previously sounded. The scale of A may be traced veering round by reference to Diagram IX., beginning with A, and carrying the four lowest notes an octave higher, F rising to F# in **ascending**, B falling to B? in descending. [Harmonies of Tones and Colours, Diagram XI - The Twelve Minor Keynotes with the Six Note of Each, page 36a]

The roots of the Minor Chord. The difference between a Major and a Minor Chord. The chords of the 12 keys follow. The sharps or flats that vary from the seven of the harmony, in the scales written to each note. The last descending chord is here seen to be the same as the first **ascending**, but this repetitive chord is only written in A. [Harmonies of Tones and Colours, The Roots of the Minor Chord, page 36c]

IF we strike the twelve as written in musical clef, beginning with the lowest A in the bass clef, each key-note, with its trinities, scale, and chords, sounds three harmonics. We may follow with the twelve keys as they **rise**, and descend by following the keys upwards as written in musical clef, each key falling lower. [Harmonies of Tones and Colours, Diagram XIII - The Twelve Keynotes with Their Trinities, page 38a]

Let us first examine the meeting of the key-notes and their trinities in musical clef; the isolated fourths rising through the progression of the twelve now meet, seven and seven pairing. We must notice how closely they are linked into each other, the three highest notes of the lower seven being the three lowest of the higher seven an octave higher, and the four lowest becoming the four highest an octave higher; we descend by following the keys as written in musical clef **upwards**. [Harmonies of Tones and Colours, Diagram XIV - The Modulating Gamut of the Twelve Minor Keys by Fifths1, page 39]

Lastly, we trace the twelve **ascending** by fifths as they veer round through the seven circles, each circle representing the eighteen tones, beginning with A in the innermost circle. A becomes the root of E, E of B, and so on. In descending, we begin with A in the outermost circle, though it is in fact the commencement of a higher series which we cannot strike. D, its root, becomes the fifth key-note lower, and so on. The keys of A and E are coloured, to show the result of the minor harmonies meeting by fifths. [Harmonies of Tones and Colours, Diagram XIV - The Modulating Gamut of the Twelve Minor Keys by Fifths3, page 41a]

Ascending, begin with A in the innermost circle, D being its root. The Key-note A becomes the root of E, E becomes the root of B, and so on. Descending, take the Key-note A in the outermost circle. D, the root of A, becomes the fifth lower Key-note, and G its root, and then G becomes the Key- note, and C its root. The same remarks concerning the writing of the meeting fifths, which are made below the corresponding diagram of the major gamut, apply to this one. [Harmonies of Tones and Colours, Diagram Shews the Modulating of the 12 Minor Keys, page 41e]

"I esteem myself fortunate in being introduced to you, and becoming acquainted with your beautiful work on 'Tones and Colours.' I have, to the best of my ability, worked out your idea, by writing down in music the various discords in use amongst musicians, and resolving them according to the laws of Harmony, and I find in all cases the perfect triad agrees with what you term the trinities in colours. The way in which you find the whole circle of Major and Minor keys by pairs in colours is deeply interesting, and must be true. The only point of divergence between your system and that recognised by all musicians is the **ascending** Minor Scale. No musically trained ear can tolerate the seventh note being a whole tone from the eighth. The Minor second in the lower octave descending is very beautiful, and it is strange how all composers feel a desire to use it. To mention one case out of hundreds, I may cite Rossini's well-known air, 'La Danza.'
"Yours faithfully,
"W. CHALMERS MASTERS." [Harmonies of Tones and Colours, Supplementary Remarks and Diagrams, page 53]

I am quite aware that musicians will set aside the Minors as here written; but I trust some minds may be led to examine the beautiful Scriptural types, too deep for our minds ever to find a beginning (the Scriptures have no beginning), and too high for our minds ever to complete **ascending**. [Harmonies of Tones and Colours, Supplementary Remarks, page 54]

See Also

---

ascending scale
major