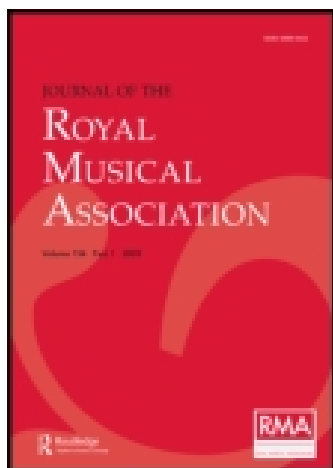


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Alfred Rhodes  
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JANUARY 7, 1895.

W. H. CUMMINGS, Esq.,

IN THE CHAIR.

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*CURIOSITIES OF THE KEYBOARD AND THE  
STAFF.*

BY ALFRED RHODES.

MR. CHAIRMAN, LADIES, AND GENTLEMEN,—For some years I have been endeavouring to apply to the keyboard and the staff the principle which guided Sir Isaac Newton in his astronomical discoveries—viz., “thoughtful attention to little things.” To this principle it is said Sir Isaac attributed all his success.

On the coast of Somerset, as the sun was setting over the Bristol Channel, an artist and a young lady were watching the waves as they rolled toward the shore. “What colour does the sea appear to you?” inquired the artist. “Oh! I see nothing but muddy water!” was her reply. “But look at the crest of that wave, what do you see there?” “A streak of gold.” “And what colour is immediately under the golden thread?” “Oh! distinctly a bright blue.” Then said the artist, “Has a little thoughtful attention turned your muddy water into blue and gold?” “I could not have thought it,” she replied; “but so it is!” So corresponding interest and pleasure came with the discovered knowledge, and in this instance we see how the application of the principle before mentioned made manifest what had previously been unobserved.

Now, in my endeavour to apply this principle to the keyboard and the staff, not only have remarkable coincidents or curiosities appeared, but it led to the discovery of another ruling principle, that of a reflective design in the construction of the keyboard; for it was found to consist of identical

arrangement of white and black keys radiating from right to left of two centres, D and G $\sharp$  or A $\flat$ , and consequently some reflective design ruling its representative notation on two staves. The reflective aspects of single notes was also found to extend to intervals, chords, and especially to modulations, which seems to have guided, whether consciously or unconsciously, our greatest masters, with the result of producing some of their highest colouring and finest effects.

Now my object this evening is to make this clear to you.

One day it was observed that when the tips of the thumbs were together, the natural design of the open fingers was (fan-like) that of inverted radiation. From this it was evident that any arrangement of keys adapted to their manipulation must, like them, have some centre for radiation and reflective design, and such design in black and white digitals I found in the construction of the keyboard.

Mr. Chairman, before proceeding to illustrate this law of reflection, I wish it to be distinctly understood that it is not my purpose in any way to obviate the difficulties of the staff notation by introducing any method of reform; but rather to face boldly these difficulties, and show reasons for their existence, and then, a scientific method how they may be overcome; for it is well to note how the staff notation has grown with the ages and is now the vehicle for the transmission of musical inspiration among peoples of every civilised nation under the sun. From this it is evident that the introduction of any new method which requires alteration of the staff can scarcely be entertained, for it means new plant for the publisher; new instruction books; also, a new educational training for all teachers of the art. Students who discard the old for any new method are not able to read the music handed down to us from many generations, so that, after all, for educational purposes, the old notation must be learnt. All this and much more is involved in any attempt at a radical reform. There is no doubt that the notation with its flats and sharps is difficult to master, its complexity produces perplexity, and it is this fact which has provoked many to attempt its reform. Seeing, however, that this is impossible (at least in our generation), any new light which may show some of its complications in simpler and more intelligible aspects will, it is reasonable to suppose, be welcomed by every musical student.

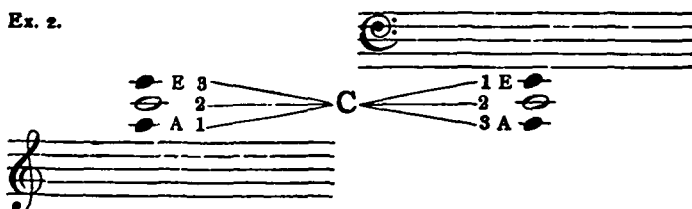
*Cross purposes.*—Some years ago, during hours of endeavour to put musical notation clearly before young enthusiasts, it often appeared as though the notation itself were playing at cross purposes. In the first place, the bass stave notes were at cross purposes with those in the treble, for their corresponding positions did not agree in name. The black ivory digitals on the keyboard had no independent

names of their own, and for that reason had a double notation of flats and sharps, named from their nearest neighbours. There was a multiplicity of scale readings of major and minor keys, ever athwart each other's paths; and if a composition said to be in a certain key was in hand, sharps and flats from other keys often intruded themselves, which, though colouring and expanding the resources of that key, nevertheless were ever at cross purposes with it. Under these complex aspects, the question often in mind was, how can this notation be intelligibly taught, so that it may be easily understood? Is there no way of classification? no method by which this chaos can become cosmos?

*Position of C.*—One morning I observed that A C E, both above and below the staves, read upward, occupied the same positions :—

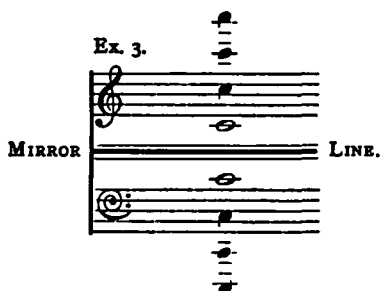


and how, in both chords, C occupied a central position. It was also observed how the treble ledger lines numbered upward 1 2 3 and the bass downward 1 2 3 (the way all instruction books teach) made A and E show themselves at cross purposes :—



I asked myself, is C central to all the notes? It was evidently so, when I considered how the great staff of eleven lines showed C on its central line. Then drawing the two staves and placing C in every position, I perceived for the first time that if a mirror were placed between the staves, all the C's of one staff would be reflected in the other, even the

very ring of the G clef round the second line of the treble staff was found reflected in the F clef, round the second line from the top of the bass staff:—



*A clear gain in the art of teaching.*—This discovery of a reflective aspect of all C's seemed to be a clear gain in the art of teaching, for the bass and treble C's could easily be learnt two at a time, if only the lines and the spaces of the bass staff were numbered downward instead of upward.

*Other stave notes.*—At this time I had not discovered how it was possible to apply the reflective principle to the other bass and treble stave notes, for it was a disappointment to find that their reflective positions did not reveal the same names, and for some time further exploration was abandoned.

*How were they found.*—One Friday afternoon, when walking over Clapham Common from one professional engagement to another, and thinking upon what I had just been teaching—viz., key-notes and their respective key-signatures, my thoughts involuntarily glanced for a moment to the position C occupied on the key-board. Counting *two* semitones to the right of C showed D the key-note for *two* sharps, and to the left, B $\flat$  the key-note for *two* flats.

*Curiosity of Coincidence.*—This revealed a curiosity of coincidence between numbers of semitones on both sides of C and numbers of sharps and flats in key-signatures. Regarding this C as a centre, my first thought was: Is the reflective principle applicable also to the key-board? Counting again from C *upward*, three semitones showed E $\flat$  the key-note for a three-flat signature, and downward three semitones A, a three-sharp key-note. But I asked how is this? Sharps according to their meaning should be upward and flats downward. Is the keyboard playing at cross purposes? and with the same letters, A and E, which at first attracted my attention at cross purposes on the staves.

At that moment semitone numbers radiating to the right and left of C were like rays of light from some star on the

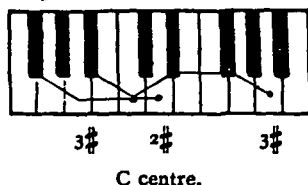
dark horizon of my then vague conceptions of key-note radiation, and my attitude of mind was like the attitude of one of those who "look for light, but behold darkness; for brightness, but walk in obscurity" (Isa. lix. 9, R.V.); but, Mr. Chairman, to be able to see anything at all, showed there was light somewhere.

Now was the time for "thoughtful attention to little things."

In this state of mind the thought occurred—there must be another centre on the keyboard which will account for this contrary aspect of flats upward from C, and sharps downward. But where is it? that was the question.

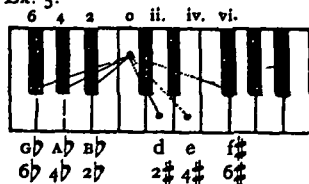
Before I had crossed the Common that afternoon, I discovered that my steps had unconsciously quickened, for light had broken out of obscurity, another star-centre had been found at  $F\sharp$  or  $G\flat$  whose rays in semitone numbers joined those from C, for three semitones downward from  $G\flat$ , showed  $E\flat$ , the same note as three semitones upward from C; also three semitones upward from  $F\sharp$  joined at A the three semitones downward from C. So that these notes were pointed at from two centres, as though some importance were attached to them, which may account for the fact why these notes combined, forming the diminished seventh chord, are called by Sir John Stainer\* "the most important chord in music."

Ex. 4.  $F\sharp$   $2\flat$   $3\flat$   $G\flat$



To the right and left of C, semitones to key-notes radiate by *even* numbers:—

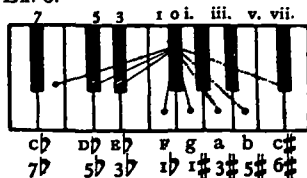
Ex. 5.



\* *Theory of Harmony*, p. 48.

To the right and left of  $F\sharp$  or  $G\flat$ , by *odd* numbers :—

Ex. 6.



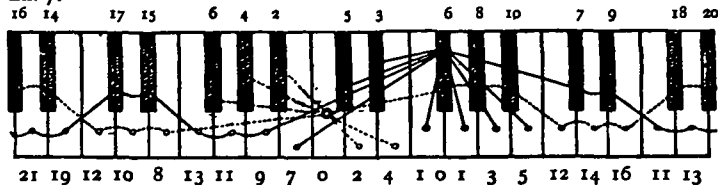
But it was also seen how, where the lines from C terminated on white keys, those from  $G\flat$  terminated on black, and *vice versa*. Please observe the diagrams: C to D, E are white keys; from  $G\flat$  centre to  $E\flat$  and  $D\flat$  are black; from C, to  $B\flat$   $A\flat$   $G\flat$  are black keys; from  $F\sharp$ , to G A B are white. From both centres you see black keys are downward and white upward.

This discovery of a second centre at  $F\sharp$  or  $G\flat$  accounted for my perplexity, and explained completely why the keyboard had played so adroitly with me at cross purposes. *EVEN* numbers of semitones were seen to correspond with *EVEN* numbers of sharp signatures upward and flat downward, and *ODD* from  $F\sharp$  upward, and  $G\flat$  downward. This radiation to *EVEN* numbers from C and *ODD* from  $F\sharp$  or  $G\flat$  was evidently the cause of that perplexity.

The keyboard was now looked upon as a picture where all lines were focussed at two centres as points of sight, and you will not be surprised when I tell you that after the day's duties were finished, great pleasure was experienced as I sketched for the first time the designs which are now before you.

That evening, I drew also another diagram, extending radiation to the utmost capacity of the key-board, and also others limited to twelve flat and twelve sharp keys, from which sometimes accidental notation is borrowed by great composers :—

Ex. 7.



The dotted line conducts the eye to *even* numbers which radiate from the C centre. The continuous line to *odd* numbers from  $F\sharp$  or  $G\flat$ . To the *right* of each centre the



number of semitones correspond to number of *sharps* to each key signature. To the *left*, number of semitones correspond to number of *flats* to each key signature.

The difficulty of applying the reflective principle to the bass and treble stave note readings still confronted me. I had discovered the two star centres from which key-notes radiated to sharps upward and flats downward, and the question now was, how was all this reflective aspect of the keyboard represented on the book—in other words, how was its notation shown on two staves? was it possible to find sharp signatures reflecting flat? and if so, what about the reflective aspects of the key-notes themselves to which those signatures were attached?

When drawing the following diagram to show a young student how six sharps and six flats were, on the keyboard, one and the same scales, I observed that although  $F\sharp$  and  $G\flat$  represented the same keyboard digital, yet they occupied two distinct positions on the staves, and **THOSE POSITIONS WERE REFLECTIVE** :—

Ex. 8.

Key-note  $G\flat$ .

MIRROR.

MIRROR.

Key-note  $G\flat$ .

Reflected.

Key-note  $F\sharp$ .

thus :—

Ex. 9.

F

F

G

G \*

G

G

F

F

The next step was an easy one. If this were so with  $G\flat$  and  $F\sharp$ , did *other* key-notes hold corresponding reflective

\* I ought to have seen (which at that time I did not) that the rings of the G and F clefs being *reflective* on the second lines of the staves supplied the key to the situation, not only to these notes, but also to the reflective aspects of A and E and B and D

positions with equal numbers of flat and sharp signatures? and the following diagram showed that they did :—

Ex. 10.

#### KEY-NOTES AS PAIRS.

It then came as a revelation how, by taking away all flat and sharp signatures, these key-notes stood before me on the staves in reflective aspects as *pairs*. Each note was found in company with another which occupied reflective positions *everywhere*, not only on the staves, but also on ledger lines; whether between the staves or above and below them, every B reflected its position on line or space as D, and D, B; A with E, and E with A; G with F, and F with G. And here was a remarkable feature in the case: *C not having either sharps or flats in its scale, and therefore without a signature, was on this account quite independent of two notations; it, therefore, stood alone, without a companion in all reflective positions as monarch of the situation, but in diatonic bond and in tonal sympathy with all other notes.*

If science be defined as classified knowledge, then this classification of pairs, B D, A E, G F, may be considered a scientific method for learning the names of the notes, and the puzzling question before-mentioned—viz., is there no way of classification? no method by which this chaos may become cosmos? is answered in the affirmative. This, however, is only one point out of many which belong to musical notation.

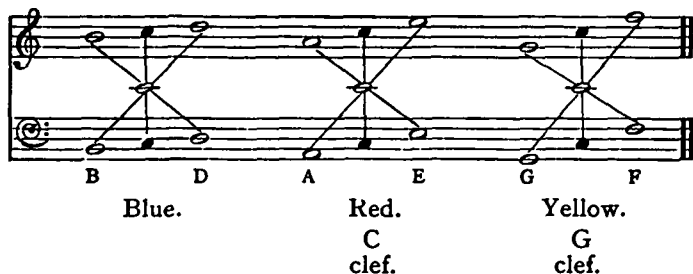
Now the law of association as an aid to memory is very valuable, and therefore it is helpful to study to classify these pairs of notes, B D, A E, G F, by the three primary colours of the rainbow—blue, red, and yellow. These colours are chosen, not in any arbitrary way, but because some hundred years ago they were used as clef signs, and consequently for stave note readings.

On turning over the pages of my notebook, dated July, 1872, written in the committee-room of the Royal Academy of Music when in class for harmony and composition, under the guidance of the late Sir G. A. Macfarren, I find the following: "Mr. Macfarren says that he possesses music to which are attached coloured lines for clefs—Blue for F, red for C, and yellow for G; also that in the first edition of Cramer's Studies, published in 1790, there is used the alto clef after the bass. Three or four times in the course of a line these clefs would change."

Now from that date to this my impression has been that the first edition of Cramer's Studies had coloured lines for clef signs. I remarked it would be difficult to read, to which Sir George replied, "Not when you are used to it."

Now the late Hans von Bülow, in his introduction to "Cramer's Studies," expresses regret at not being able to find any information as to when or where the first edition of "Cramer's Studies" was published.\* It is evident Sir George Macfarren could have supplied an answer—

Ex. II.



B D are easily remembered by B for Blue.

This diagram shows C as a star-centre and classification of stave notes radiating in pairs. They may also easily be

\* It is very likely that Sir George had reference to only a few studies, for the second part appeared in 1810, published by Breitkopf and Härtel (Grove's Dictionary, Vol I., p. 414).

found and remembered by playing the notes in contrary motion from the C, or F and G, as centres.

Ex. 12.



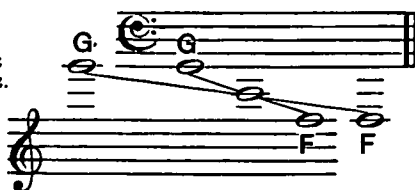
FROM  $F\sharp$  OR  $G\flat$  RADIATE LEDGER LINES.

When comparing ledger lines either between the staves or below the bass and above the treble, F and G become the chief centres, because these notes in radiation from C meet at the *fourth*, and *between the staves* at the *third* ledger lines.

F AND G, CENTRAL, BELOW THE BASS, AND ABOVE THE TREBLE.

Ex. 13.

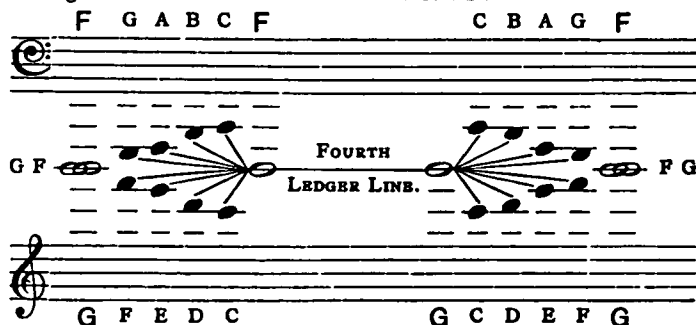
G FOURTH  
LEDGER LINE  
above TREBLE.



F FOURTH  
LEDGER LINE  
below BASS.

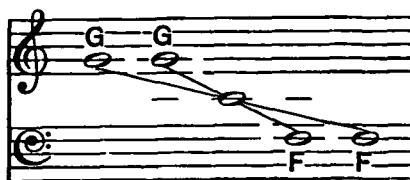
Ex. 14.

Ledger lines below Bass and above the Treble Stave.



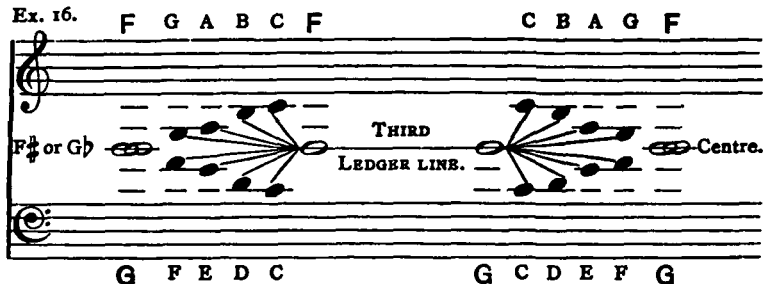
## LEDGER LINES G AND F.

Ex. 15.

G THIRD  
LEDGER LINE  
above BASS.F THIRD  
LEDGER LINE  
below TREBLE.

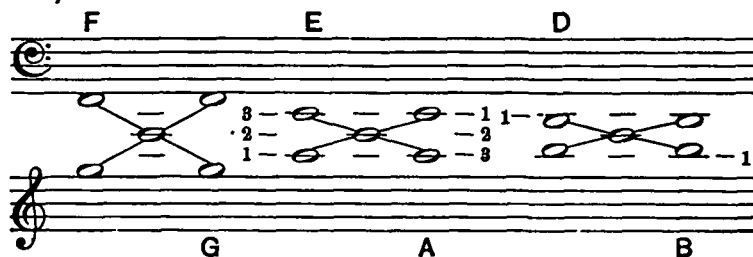
## F AND G CENTRAL BETWEEN THE STAVES.

Ex. 16.



RADIATION FROM C SHOWS LEDGER LINE READINGS OF F G,  
A E, AND B D, AT CROSS PURPOSES.

Ex. 17.



Whether, therefore, C or G F be regarded as centres, the same letters are found in reflective radiation, and that is so over the whole notation.

Ex. 18.

The musical score for Exercise 18 consists of two staves, treble and bass. The treble staff begins with a treble clef and a key signature of one sharp (F#). The first measure contains the notes D, B, E, A, F, G. Above the staff, the notes D, B, E, A, F, G are written. The second measure contains the notes B, D, A, E, F, G. Above the staff, the notes B, D, A, E, F, G are written. The bass staff begins with a bass clef and a key signature of one sharp (F#). The first measure contains the notes B, D, A, E, G, F. Above the staff, the notes B, D, A, E, G, F are written. The second measure contains the notes 3, 5, 7. Above the staff, the notes 3, 5, 7 are written. The word 'MIRROR.' is written above the first measure of the bass staff. The notes 6, 4, 2 are written above the first measure of the bass staff. The notes 3, 5, 7 are written above the second measure of the bass staff. The notes C, D, B, E, A, F, G are written above the third measure of the bass staff. The notes C, B, D, A, E, G, F are written below the third measure of the bass staff.

The following diagram may be said to summarise under three heads what has to this point been shown—1st, reflective aspects of the notes; 2nd, regarded as KEY-NOTES, reflection of identical numbers of sharps *versus* flats in their signatures; 3rd, the numbers of sharps *versus* flats correspond with numbers of semitones, radiation of EVEN from C and ODD from F# or Gb centres.

Ex. 19.

0 2 4 6 8 10 2 4 6 8 6 1 3 5 7 9 11 6

PATHWAY OF THE OBSERVER.

0 2 4 6 8 10 2 4 6 8 6 1 3 5 7 9 11 6

The image displays three musical exercises, each titled "PATHWAY OF THE OBSERVER." Each exercise is written on a grand staff (treble and bass clefs) with a central line for the title. Fingerings are indicated by numbers 1-10 above or below notes. Chord symbols (C, F#, Gb) are placed between the staves.

**Exercise 1:** Treble staff notes: 6, 1, 3, 5, 7, 9, 11, 6, 4, 2, 0, 2, 4, 6, 0, 6, 2, 10. Bass staff notes: 6, 1, 3, 5, 7, 9, 11, 6, 4, 2, 0, 2, 4, 6, 0, 6, 2, 10. Chord symbols: C.

**Exercise 2:** Treble staff notes: 4, 12, 6, 1, 3, 3, 1, 5, 1, 7, 7, 5, 3, 1, 6, 4, 2, 0. Bass staff notes: 4, 12, 6, 1, 3, 3, 1, 5, 1, 7, 7, 5, 3, 1, 6, 4, 2, 0. Chord symbols: F#, Gb, C.

**Exercise 3:** Treble staff notes: 2, 2, 6, 10, 0, 4, 6, 6, 9, 5, 1, 6, 1, 3, 2, 4, 6, 4, 0. Bass staff notes: 2, 2, 6, 10, 0, 4, 6, 6, 9, 5, 1, 6, 1, 3, 2, 4, 6, 4, 0. Chord symbols: F#, Gb, C.

Now what is the practical good of all this? Two facts will illustrate.

One morning, soon after my discovery of the reflective aspects of stave notes, while teaching a young lady to play a composition, her sister, a child between seven and eight years of age, came into the room. I said: "My little friend, do you know your notes on the stave?" She replied: "I know nearly all my treble notes but I cannot learn the bass!" "Well, suppose I show you a way how to learn the bass notes by what you already know of the treble!" "O, thank you," she

said. I spent about a quarter of an hour in showing her the reflective positions of the three pairs of letters, so that if she knew B on the third line in the treble, it was easy to remember D on the third line in the bass, &c. What was the result? The next time I went to the house my young friend said: "Mr. Rhodes, do set me a lot of treble notes. I like to copy them in the bass and say what they are!"

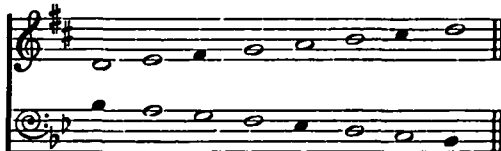
Now children when making a spontaneous remark do so without reserve and generally say all the truth and nothing but the truth, and therefore make good witnesses to the practical utility of a method for instruction which is suited to their capacity.

The other fact is: A gentleman was playing at sight in my own home; he found it necessary to leap to a note under the third ledger line below the bass stave; he remarked: "'Pon my word, Mr. Rhodes, I do not know the name of that note!" "Well," I replied, "perhaps you know the name of the note over the third ledger line above the treble stave?" "Oh, yes, it is F there." "Then, according to the reflective principle, what must it be in the bass?" "G," he at once replied, and remarked: "I never saw the advantage of the reflective method before." "Yes," I replied, "you see it is like the multiplication table applied to the staves; for did you ever notice that that table has a reflective side to it? for if you cannot remember how many four times six make, you may find it by remembering how many six times four are." "Oh, yes," he replied, "it is quite a new light over musical notation."

## PART II.

If key-notes radiate from two centres, showing sharp signatures upward and flats downward, surely it was natural to suppose that scales would do the same. So drawing scale D with two sharps, and in the bass, B $\flat$  with two flats, and making black notes on the staves to represent black digitals on the keyboard, their reflective aspects appeared, so—

Ex. 20.



But these scales, as you see, do not show black keys reflecting black, but they would do so if we commenced with D for the B $\flat$  scale, and extended the D scale to F $\sharp$ , so—



Ex. 21.



But how is this? Why do not sharps and flats on the keyboard answer to each other in reflective aspects, if key notes with equal number of sharp and flat signatures do so on the two staves?

The answer was not difficult to find, because I had discovered years before that D and G# or Ab are the *keyboard* centres for reflective aspects of its white and black keys; but these are not *key-note* centres, and why? Because the basis of the construction of the keyboard is the diminished triad. This may be known by considering how this combination, B D F, is found on white keys only; these notes form the crown of the dominant seventh chord and consequently are derived from the uncurling of harmonic sounds, generated from the dominant root; hence it is clear that the basis of keyboard construction is upon that of natural harmonic law, and it will be shown presently how D and G# or Ab are the centres of key-signature reflections. But the reflective aspect of notation is based upon radiation of *key-notes* from two *other* centres as demonstrated in the former part of this lecture. So that, though the scales themselves with equal number of sharp signatures show on the staves their notes in corresponding positions with scales of equal number of flat signatures (because each scale-note *name* is derived from *key-note* reflections), yet black keys do not reflect black nor white at all times white, because *keyboard* centres for reflective aspects of its digitalis are not *key-note* centres.

To demonstrate. Place a hand-mirror on D or G# or Ab (or anywhere) on the keyboard, and play with the right hand in order the seven flat signatures; each flat will be seen in the mirror reflected as a sharp in the order of the seven sharp signatures in the bass staff—

Ex. 22.



Now this keyboard reflection is perfect whether D or A $\flat$  or G $\sharp$  be considered as centres of key-signature reflection; but the sharps and flats are not in reflective positions on the staves.

# KEYBOARD CENTRES THE CAUSE OF ACCIDENTAL NOTATION TO COMMON CHORDS.

Although we have spoken of the keyboard as possessing two centres, the following illustrations show that these centres are repeated at intervals of two octaves.

If a hand-mirror, with its face to the right, be placed upon D, by looking into it when in the treble major and minor thirds are alternately being played, these white or black keys will appear repeating themselves in the bass; hence from them major and minor common chords may be developed in reflective order—

MINOR thirds are shown by black notes, MAJOR by white.

Ex. 23.  
First section.

D centre. First Minor Thirds, then Major. Minor. Major. Dim. triads

It may be observed that in this section the minor chords in the treble are composed of intervals within the bars of the bass stave; and the major chords in the bass, of intervals within the bars of the treble stave.

Second section.

First Major Thirds, then Minor. Major. D Minor. Dim. triads

From G $\sharp$  or A $\flat$  centre flow a double notation of black digitals, and double sharps and flats of white. The following shows the reflective aspect of major and minor common chords when the mirror is removed from D to G $\sharp$  or A $\sharp$ .

# ACCIDENTAL NOTATION TO COMMON CHORDS FROM $A^b$ OR $G^\sharp$ CENTRE.

Ex. 24.

Third section.

First Minor Thirds, then Major.

$A^b$  or  $G^\sharp$  centre.

Minor.

Major.

7 $^b$  6 $^b$  5 $^b$

$A^b$   $E^b$   $B^b$

$C^\sharp$   $F^\sharp$   $B$

7 $^\sharp$  6 $^\sharp$  5 $^\sharp$

Fourth section.

First Major Thirds, then Minor.

Major.

$A^b$   $E^b$   $B^b$

$C^\sharp$   $F^\sharp$   $B$

Minor.

4 $^\sharp$  3 $^\sharp$  2 $^\sharp$

Fifth section.

First Minor Thirds, then Major.

$G^\sharp$  or  $A^b$  centre.

Minor.

Major.

5 $^\sharp$  6 $^\sharp$  7 $^\sharp$

$G^\sharp$   $D^\sharp$   $A^\sharp$

$D^b$   $G^b$   $C^b$

5 $^b$  6 $^b$  7 $^b$

8 $^\sharp$  9 $^\sharp$  10 $^\sharp$

Sixth section.

First Major Thirds, then Minor

Major.

Minor.

8 $^b$  9 $^b$  10 $^b$

$G^\sharp$   $D^\sharp$   $A^\sharp$

$D^b$   $G^b$   $C^b$

8 $^b$  9 $^b$  10 $^b$

Sec. 6, Double Flats

The final chords of the last section introduce  $C^x$  and  $E^b$  as new names of  $D^b$ —our first and now familiar keyboard

centre. If from this centre, with its new names, we reflect the white keys of the first section, key chords are found which complete the second key circle, and also  $F\sharp$  and  $G\flat$  as the penultimate chords of limited notation.

Double flats or sharps generated from  $E\flat$  or  $C\sharp$  are chiefly found amongst chromatic harmonies. The  $F\sharp$  and  $G\flat$  as *key-notes* are not, to the writer's knowledge, found in any work. But  $F\sharp$  is the dominant note of  $B\sharp$ , or twelve sharp key: and  $G\flat$  is the subdominant of  $D\flat$ ; and therefore these come within the radius of keys from which composers borrow notation.

In the following study of key chords, the bass (as in above examples) descends first to minor and then major intervals of thirds. Major thirds represent major key-notes; minor thirds, their relative minor key-notes. In the treble, the alteration from chord to chord is only a single note, and its progression is to the same root note to which the bass moves.

#### NO. I.—STUDY OF KEY CHORDS.\*

Ex. 25. Bars 1 2 3 4

C A min. F D min.  $B\flat$  G min.  $E\flat$  C min.

5 6 7 8

$A\flat$  F min.  $D\flat$   $B\flat$  min.  $G\flat$   $E\flat$  min.  $C\flat$   $A\flat$  min.

Identical digitals with  $7\sharp$ ,  $6\sharp$  and  $5\sharp$  keys.

9 10 11 12

$C\sharp$   $A\sharp$  min.  $F\sharp$   $D\sharp$  min. B  $G\sharp$  min. E  $C\sharp$  min.

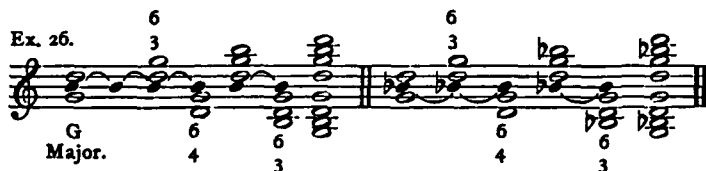
Identical digitals with  $5\flat$ ,  $6\flat$ , and  $7\flat$  keys.

\* Beethoven, Mass in C, p. 200 (8vo, Novello).



## THE REFLECTIVE ASPECT OF COMMON CHORDS.

The central note, or third of a common chord, is, when in close form, the pivot of its inversions.



The interval of the perfect fourth is everywhere conspicuous in the *inversions* of a *common chord*. The student may claim the highest note of this interval as the *root*. Its reflective aspect on the keyboard, from the two centres, may be viewed in symmetrical order thus:—

## G# OR Ab CENTRE.

Ex. 27.



## D CENTRE.

Ex. 28.



\* A young student will find valuable aid to a knowledge of inversions of common chords, if on the keyboard he plays first these fourths, and then adds major or minor thirds above or below; at the same time naming them first or second inversions as the case may be, together with the root thus:



Second inversion of B $\flat$  major and first inversion of G minor.

Now it matters not whether the *treble* stave chords in Study I. commence with a first or second inversion, for the same rule applies—viz., that the alteration of a single note from chord to chord is to the same named note as that to which the bass moves.

Ex. 29.

Treble <sup>6</sup><sub>3</sub> Chord. <sup>6</sup><sub>4</sub>

C    A    F                      C    A    F

Of course these limited examples need not be regarded as *key chords*; their progression equally applies to single keys. The first three chords of Example 25 begin Luther's tune "Worms."

Ex. 30.

C    A    F                      C    A    F

The second three are in our National Anthem.

Ex. 31.

C    A    F                      6    4

It requires DOMINANT HARMONIES to determine key chords.

## KEY CHORDS FOLLOWED BY THEIR DOMINANT CHORDS.

The simplest progression is to follow the key chords of Study I. by their dominant common chord thus:—

Ex. 32.

C dom. A dom. F dom. D dom. Bb.  
maj. min. maj. min. maj.

"ST. BRIDE" (Third strain).

Ex. 33.

C dom. A dom. F dom. 6  
maj. 7 min. 7 maj. dim. triad.

## THEIR CONTRARY MOTION.

The reflective aspect of the above progression is found when the dominant chord *precedes* the key chord.

Ex. 34.

dom. C. dom. E. dom. G. dom. B. dom. D.  
of min. of min. of min. of maj.

"Ombersley," L.M., third strain, is a case in point.

Ex. 35.

dom. G. dom. B. dom. D. dom. G.  
of min. of min. of maj.

My purpose in the following illustrations is to show that the great masters, whether consciously or unconsciously, were often guided in their choice of keys and harmonic progressions by this principle or law of reflection. If consciously, it would be interesting and instructive to know if any record or intimation has been left of their having been guided when composing by such a principle, for it is certain their works reveal it. If they follow unconsciously such a law, it is the more remarkable, for it shows an unwritten law "written on their hearts," and in this light the result of my endeavours is but the discovery and giving expression in words of such a law, and thereby rendering it accessible as an important basis for study, which cannot but be regarded as worthy of careful consideration by all professors and students of musical composition.

The following selections from Schumann, Beethoven, and Mendelssohn will be sufficient to testify to the effect, conscious or unconscious, which this principle has had on the modulations in their compositions.

# SCHUMANN'S A MINOR CONCERTO (Op. 54).

(Fourteenth score)

Ex. 36.

C maj.      A min.      F maj.      R Dom. of key C.

These key chords (C major, A minor, F major) are the first three of Study I. By contrary motion (from the end of the study) they are C, E minor, G major, and this reflective aspect is found in the sixth and seventh scores of the same Concerto thus:—

Ex. 37.

C maj      its dom.      E min.      its dom.      G maj.      its dom. G.



## REFLECTIVE ASPECTS OF MODULATIONS IN BEETHOVEN SONATAS.

Key chords of third and fourth bars of Study I., preceded by their dominant harmonies, are found in the sixth score of Beethoven's Sonata in E flat (No. 4) :—

Ex. 38.

Dom of                      B $\flat$  maj.      G min.      E $\flat$  maj.

C min.                      6  
4

The keys G, E $\flat$ , C, of bars 3, 4, 5,\* are found in contrary or reflective order in the Rondo of "Sonata Pathétique."

Ex. 39.

C min.

E $\flat$  maj.                      G maj.

\* Arpeggios and passing notes are omitted in order that the key chords may be more readily discerned and compared with example 25, bar 4. Also example 25, bar 4, compared with bars 16 and 15, shows Beethoven's ascent from C minor to E $\flat$  major; and Schumann's, from C major to E minor

## ANOTHER EXAMPLE OF THE SAME RELATION OF KEYS AS IN STUDY I.

Also key chords of fifth and sixth bars of Study I. are comprised within bars thirty-two to forty-four of Sonata in C minor (No. 5).

Ex. 40.

Bar 33.  $A\flat$  maj.

Bar 37. F min.

Bar 41.  $D\flat$  maj.

For purposes of study the above progressions of keys and their reflective aspects or contrary progressions to major and minor keys may be regarded as *pairs*. But a second progression is often found and its contrary modulations thus, say from G major to its relative E minor, then to D major and its relative B minor; A major and its relative to  $F\sharp$  minor, thence to E major. REFLECTIVELY E major,  $F\sharp$  minor to A major, B minor to D major, &c. These reflective aspects may be considered as a *second pair*.

Beethoven's FIRST movement of his Symphony in D affords an illustration of the first progression of this second pair of minor thirds and major seconds. So :—

Ex. 41.

*f* *p*

*sf* G maj.

E min.

cras. f

D maj.

Again, this progression is followed from the opening of the dominant subject : A major, F# minor, and E major.

Ex. 42.

A maj.

A Maj. F# Min. F# Min.

E Maj. Dom. 7th of E Maj. key chord. &c.

We here find Beethoven *descending* through sharp keys, the signatures of which *increase* from G, one sharp, to E, four sharps. But in Mendelssohn's "Spring Song" (*Lieder*, No. 30, 9th score), we find this order in reflective aspect. Beginning with E (four sharps) he passes on to F# minor, A major, B minor, and D major. Mendelssohn, in contrary motion to Beethoven, *ascending*, sharp signatures *decrease* from four of key E to two of key D; so—

MENDELSSOHN'S "SPRING SONG" (*Lieder*, No. 30).

Ex. 43.



These examples of the respective aspect of key progressions in *pairs*, suggest how the perplexing art of modulation may be classified and intelligently studied in set grooves; and thereby that power over key relationship be developed, for which the great masters have ever been remarkable in their extempore or "cadenza" performances.

In conclusion, Sir John Stainer said, at the tenth annual Conference of the Incorporated Society of Musicians, held in Dublin, January 1, 1895, that—"The musician can no longer remain a mere clever craftsman. He must explore *all the by-paths on either side of his course*; and what was still more important, he must realise the fact that all this training had for its sole object the better appreciation in himself and the better interpretation for others of the beauty, the

idealism, and the emotional expression of the creative genius of the composer. This outburst of intellectual life compelled modern musicians to strive to keep up to date in all that concerned their art and its exposition."

Now it is obvious that this lecture is on the lines of Sir John Stainer's clever statements, for though my endeavour has been to search for reasons for the perplexing difficulties of musical notation, yet inevitably it led me "to explore the by-paths on either side of the course," which also led to the discovery of a reflective principle, which has been a beaming and guiding light, showing both sides of the way: sharps on one side and flats on the other. It has also shown the musician's pathway of thought lying between, as we have seen demonstrated by examples from the works of the great masters.\*

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## DISCUSSION.

THE CHAIRMAN.—We have all been delighted with the interesting and admirable paper just read. I confess I came here knowing nothing about the subject, and I would even go farther than that and say that I knew nothing about the construction of notation before. I had come to the conclusion that the musical stave had been built up by degrees, just as people required a little more help; that it began in a sort of haphazard way, and each man and generation added something to it, in order to make it a little more useful, as time went on. I think Mr. Rhodes has discovered for us a very splendid defence for our system of notation. I had not the least idea that we could bring science to show how admirably it has been constructed—in fact, this revelation to us would rather suggest that the formation of our notation and scale was an inspiration. After the splendid exhibition we have had—so simple to all conversant with music—of our old notation, which we love, since it gives us the classics of all the past ages, in future we shall not fear any new notation that may be brought forward with the idea of superseding the admirable system universally adopted. I am sure you will accord to Mr. Rhodes a sincere vote of thanks for the paper he has given us.

The vote was passed unanimously.

\* The above exposition of the principle of reflection applied to the keyboard and the staff is part of a copyright work now in the press, entitled "*Curiosities of the Keyboard and the Staff*," particulars of which will be sent by the Author, "Aysgarth," 55, Leander Road, Brixton Hill, S.W., on receipt of an addressed post card. Publisher: Reeves, 185, Fleet Street.

Mr. ARTHUR TRICKETT remarked that he had given this matter some attention eight or nine years ago, and quoted instances of mechanical agreement, by inversions, of scales, in thirds and sixths :—



He also introduced the following examples of mechanical inversion—



Mr. Trickett then produced a book of exercises by Henselt (written in all probability forty or fifty years ago) constructed in accordance with this principle of inversion, and expressed his conviction that the fringe only of an important feature was being touched upon.

Mr. SOUTHGATE.—I do not rise to criticise or offer an opinion upon the interesting lecture we have had, but to make one remark upon a statement which the lecturer made. He spoke of our notation as having been used by every nation under the sun since the eleventh century. [Mr. RHODES: Every civilised nation.] I accept the correction, but do not think you said so. I only just point out that it is hardly correct. We ourselves were not using that notation in its entirety at that period, while at the present time there are other systems of notation. We must also remember that the tablature of the lute was employed until within a few hundred years ago, and that a form of this tablature was used for the flute and the hautboy, rather than the employment of lines and spaces. And then, till a very late period indeed, the letter notation was used in Germany. I know that our Chairman has a remarkable book, which, I think, is dated 1601; it contains a large number of motets, antiphons, and pieces of that sort, all the parts being in the letter notation, some of them in as many as eight parts. This shows that the staff notation did not prevail, even in Europe, till much later than the period he said. May I mention, with regard to the question of colouring, that of course we have plenty of missals with the lines on which the C and F clefs stood coloured yellow and red, which enabled the eye to pick them out.

The CHAIRMAN.—This is supposed to have been invented in the eleventh century, but Grove's Dictionary tells us that in the Bodleian Library there is a prayer of earlier date, with music on the stave, but, no doubt, this is an error.

Mr. SOUTHGATE.—Will you allow me to say I have seen that book, and there has been much discussion on it. Sir George Grove and those who advised him were mistaken. It occurs in the Westminster "Troparium," and that was written, no doubt, in the ninth century; and in that is found a prayer for King Ethelred on lines and spaces; the theory is that it could not have been written after his death, and must have been written in his lifetime. But it is conclusively proved that a later hand put that piece in the book; indeed, if you look underneath the present text you can see the original writing which was there before.

The CHAIRMAN.—We are glad to have had this discussion and are obliged to Mr. Trickett for his remarks; it is interesting to find that the matter has been in the minds of two men, who have worked independently of each other.

Mr. RHODES.—I am very much obliged for the manifest interest you have shown in the subject. I may say that on these lines of reflective aspects of notation there are whole regions which I have explored, but obviously time would not allow of their being mentioned. For example, in the region of reflective aspects of notes on *single staves*, we may observe that the alto stave, having C on its central line, the other six letters reflect in pairs at equal intervals above and below it, precisely as they do on the two staves. Also there are regions of harmonies the reflective aspects of which Mr. Trickett has given such happy illustrations, and which he says he observed nine years ago. I am much obliged to him for bringing them forward. But his remarks only touch upon the latter portion of my lecture—*i.e.*, the reflective aspect of chords when played on the keyboard, and shown on my diagrams, from D to G# or A<sup>b</sup> centres. May I ask Mr. Trickett whether he has seen the reflective aspect of KEY-NOTES which radiate from C and F# or G<sup>b</sup> in semitone numbers, corresponding to numbers of sharps and flats in each reflective key signature? or the reflective aspect of these notes on two staves?

Mr. TRICKETT.—Not as regards the staves.

Mr. RHODES.—It is here that the discovery is so new. I was not aware that on this theme anyone had traversed in any direction the same ground as myself, and it appears that Mr. Trickett's thoughts and illustrations have had reference only to keyboard reflections. I am sure you will heartily join with me in a vote of thanks to our worthy Chairman, who has so ably and kindly conducted the meeting. For myself, I feel it to have been a great honour to have had him in the chair on this occasion.

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