

middle

middle or central [note](#) of a three note [chord](#)

Russell

Opposite [poles](#) of a [bar magnet](#) thrust away from each other as far as they can go. That is the very purpose of the [electric current](#) which divides the [universal equilibrium](#). If opposite [poles](#) attracted each other they would have to be together in the **middle**, instead of "pushing" away from each other to the very ends. [[A New Concept of the Universe, page 18](#)]

Schauberger

[forces](#) from the lower [temperature group B](#), which [enforce](#) the [gravitation](#) of all that cannot be [uplifted](#). This [duality](#) therefore involves a [rhythm](#) within a [rhythm](#) - a sort of [four-stroke motor](#), in which [upward](#), [downward](#), [inward](#) and [outward impulses](#) can rhythmically take place on a common [developmental axis](#). A [perpetual state of turmoil](#) is constantly created in an [epicentre of commotion](#), leading to continuous [fission](#) and [fusion](#) ([separation](#) and [combination](#)), whereby what matters is which [metabolic process predominates](#). In other words, in this [primordial battle](#) between the [ur-feminine](#) and the [ur-masculine](#), whether the [re-destructive](#) or the [re-creative](#) is victorious. The one that triumphs is the one that is able to drag its [opponent](#) into the **middle** of this gigantic [wrestling match](#), there to [encircle](#), [bind](#), [consume](#) and [digest](#) it. [[The Energy Evolution - Harnessing Free Energy from Nature, The Life-Current in Air and Water](#)]

Schauberger

2. The [stocks](#) of all [forms](#) of so-called [oxygen travel down](#) the **middle** and with [increasing cooling](#) become [inactive](#) and [shrivel](#) up like their [counterparts](#), the [beads](#) of [carbon dioxide](#) in [warmed water](#). At the same time these [increasingly indifferent](#)[17] [fertilising substances](#) ([oxygen](#)) are [accelerated mechanically](#) along the [unrestricted](#) (no [guide-vanes](#)) and shorter [central axial path](#) and are thereby [dispersed](#), or [dosed](#) as it were. (see [fig. 16](#)) [[The Energy Evolution - Harnessing Free Energy from Nature, The Liquefaction of Coal by Means of Cold Flows](#)]

Ramsay

"The [prime 5](#), like the [prime 3](#), produces new notes. One of these, namely A5, is derived from [unity](#), i.e., the note produced by the [ratio](#) of 1:2; the second note is produced from the note derived from the first power of 3, namely E15; and the third is produced from the note derived from the second power of 3, namely B45. The notes thus produced by the [prime 5](#) are the **middles**, that is, the [thirds of the chords](#). As it is the second and third powers of 3 which possess great [centrifugal force](#), and not the first power of that number; and as it is only the first power of the number 5 which [Nature](#) employs in this business, so this makes the [character](#) of the notes produced by the [prime 5](#) to depend on the [character](#) of the notes from which they are derived. One of the 3 notes produced by the [prime 5](#) is derived from [unity](#), that is the note produced by the ratio of 1:2, and like that note it is strongly acted on by the [force of gravity](#).¹ A second note produced by the [prime 5](#) is derived from the note produced by the second power of 3, and like that note it possesses increased" [[Scientific Basis and Build of Music, page 27](#)]

In order to find the notes for the next [major key](#) above C, we have to multiply the [vibration-number](#) of D, which is the [top of the dominant](#) C, by 3 and 5. It is out of the [key of C](#) at this point that the new [key](#) sprouts and grows, and by the primes and method which produce the [key of C](#) itself. So if we would find the [relative minor](#) of C, let us take the note which is a [minor third](#) below D - that is, B - to produce the [minor](#). The [minor](#) sprouts and grows from this point of the [key of C](#); for the [relative minor](#) grows out of the [major](#), as out of the man at first the woman is taken. Moreover, B is the last-born of the notes for the [major scale](#); for the **middles**, that is, the [thirds](#)

of chords, are always produced by the prime 5; and the tops, that is, the **fifths of chords**, are produced by the prime 3, and are born before the **thirds**, though placed after them in the chords. Well, because B is the last-born note of the **major**, as well as a **minor third** below the top of the highest chord of the **major**, it seems that the **minor** should have this for its point of departure. Again, we have seen that the **major** and the **minor** are found in their strings and their vibrations by an **inverse process**, that one going back upon the other; and, there taking Nature's clue, let us proceed by an **inverse process** of generating the **minor**. Making B45 our **unit**, as F1 was our **unit** for the **major**, let us divide by 3 and 5 for a **root** and **middle** to B, as we multiplied by 3 and 5 for a top and **middle** to F. B45 divided by 3 is 15; here then is our E, the **root of the chord**, just where we had found it coming upward; for, remember, we found E15 by multiplying C3 by 5. This E, then, is the same in **major** and **minor**. Now B45 divided by 5 is 9; [[Scientific Basis and Build of Music, page 31](#)]

this is the **middle** of our **chord**, E, G, B; and remember that this also is G as we found it coming upward, C3 multiplied by 3 being G9. This is another **note** of the **minor**, the same in its quantity as that of the **major**. Now for another chord downward we must divide the **root** of the one we have found, namely E15, by 3, which will give us A5, the root of a **center chord** for the **minor**, and the very **key-note** of the **relative minor** to C. And remember that this A5 is just as we found it in coming upward, for F multiplied by 5 gave us A5. Now divide E15 by 5 and we have C3, the **middle** to our **minor chord**, A, C, E. Still we must remember that this C3 is just as we found it coming upward, for F multiplied by 3 is C3. Behold how thus far **major** and **minor**, though **inversely developed**, are identically the same in their notes, though not in the order in which they stand in the **fifths** thus generated. [[Scientific Basis and Build of Music, page 32](#)]

THE GREEK MODES AND DUALITY BY THE EDITOR

The Greeks most probably constructed their musical **tetrachords** in a symmetrical order in analogy with their sculpture, and showed the **ear** identical with the **eye** in its **love** of **symmetry**. With them, therefore, the **Dorian mode** would have a certain pre-eminence. Beginning this **mode** on D, without knowing the **musical mystery** that resides in D, they had two **tetrachords** with the **semitones** *symmetrically in the middle* in one **mode**; it was next possible for them to arrange in *pairs, symmetrically*, the other **tetrachords**.

D8 E5 F9 G8 A9 B5 C9 D
E5 F9 G8 A9 B5 C9 D8 E — C9 D8 E5 F9 G8 A9 B5 C
F9 G8 A9 B5 C9 D8 F5 F — B5 C9 D8 E5 F9 G8 A9 B
C9 D8 E5 F9 G8 A9 B5 C — E5 F9 G8 A9 B5 C9 D8 E
B5 C9 D8 E5 F9 G8 A9 B — F9 G8 A9 B5 C9 D8 E5 F
A9 B5 C9 D8 E5 F9 G8 A — G8 A9 B5 C9 D8 E5 F9 G
G8 A9 B5 C9 D8 E5 F9 G — A9 B5 C8 D9 E5 F9 G8 A

[[Scientific Basis and Build of Music, page 45](#)]

The **CHROMATIC SYSTEM** of **chords** is developed from these three primitive **chromatic chords**, and in the course of its development one or two notes are brought in **semitonic progression** to the **middle**, one or two to the **root**, and one or two to the top of all **major** and **minor tonic chords**. Likewise, at one time or another in the course of the system, there is one **note in common** with the **middle**, one **note in common** with the **root**, and one **note in common** with the top of all the **major** and **minor tonic chords**. [[Scientific Basis and Build of Music, page 57](#)]

This great **genetic scale**, the all-producer, the all-container, extends over six **octaves** on each side; for it is not till high in the sixth **octave** we get B in the **major**, and it is not till low in the sixth **octave** that we get F in the **minor**. It is in the fifth **octave**, however, that the **note** which is the distinctive mark of the **masculine** and **feminine modes** is generated. D27 in the **major**, and D26 2/3 in the **minor**, distinguishes the **sex** of the **modes**, and shows which is the head and which the helpmeet in this happy family.² On the **major** side F, the **root of the subdominant chord**, that is the **chord** which is a **fifth** below the **key-note** C, is the **root** of all. This is the beginning of this **creation**. If we call the **vibration-number** of F *one*, for simplicity's sake, then F1 is multiplied by 3 and by 5, which natural process begets its **fifth**, C, and its **third**, A; this is the **root**, **top**, and **middle** of the first **chord**. From this **top**, C3, grows the next **chord** by the same natural process, multiplying by 3 and by 5; thus are produced the

fifth and third of the second chord, G and E. From the top of this second chord grows the third and last chord, by the repetition of the same natural process; multiplying G9 by 3 and by 5 we [Scientific Basis and Build of Music, page 66]

Now we come to a remarkable arrangement of Nature. The minor does not grow in the same way out of this third chord's top. Two features come before us: first the minor chord grows out of the major, but it is *taken not from the top but from the middle*, from a rib out of his side. B, the middle of the major dominant chord; B, the last-born of the major genesis; B is the point of departure in the outgrowth of the minor mode. The feminine is a lateral growth from the masculine. Another feature: it *grows downward*, like a drooping ash or willow. Its first generated chord is its dominant, and its last is its subdominant. Its middle chord, like the middle one of the major, is its tonic. Still further, it is *generated by division*, not multiplication; B45 is divided by 3 and by 5 for the root and middle of this highest chord, E and G. E15 is divided by 3 and 5 for the root and middle of the tonic chord, A and C. A5 is divided by 3 and 5 for the root and middle of the lowest chord, D and F. Thus we have the whole generation of the elements of music, six generations of harmony, like the six days of creation. Up to this point the whole process and aspect is *inverse*; growing from a middle; growing downward; growing by division; while the major is growing from the top; growing upward; growing by multiplication. But here the inverse aspect ends. The generating primes of the major are 3 and 5; 3 and 5 are also the generating primes of the minor. In this essential phase of their creation their comparison is *direct*, not *inverse*. [Scientific Basis and Build of Music, page 67]

The varied effect of position in chords. When a chord stands as C E G C, having its root also at the top, it has its softest, dullest, most united effect; it is undramatic, with little contrast. When it stands as E G C E, having its third at the top and bottom, it has a more ticklish, interesting, far-away effect. In reveries composers often finish thus, as if it had vanished - an unsettled effect. When it stands as G C E G, with its top at top and bottom, it has its most dominant character - loud, swelling. In the position C E G C it stands mixingly with the subdominant C E f G a C, and in this its first position its unseen filling in is chiefly from the region of gravity; hence its soft, grave, dull, heavy effect; and it passes very easily to the subdominant chord. When it stands as G C E G it stands mixingly with the dominant G b C d E G, and has its third position and most brilliant effect and uprising, for its unseen filling in is then chiefly from the region of levity; and it passes easily to the dominant chord. When in its second position, its middle position E G C E, its unseen filling in is mixingly both subdominant and dominant, E f G a b C d E; it has then its most interesting and puzzling effect; on the one hand its softest, dullest, and one-est, on the other hand its most brilliant effect, as if it would at once both sink and soar. [Scientific Basis and Build of Music, page 72]

There is nothing extraordinary in this. It is another fact which gives this one its importance, and that is that the musical system is composed of *three fifths* rising one out of another; so this note by 3/4 becomes the root not only of a chord, but the root of all the three chords, of which the middle one is the tonic; the chord of the balance of the system, the chord of the key; the one out of which it grows, and the one which grows out of it, being like the scales which sway on this central balance-beam. Thus F takes its place, C in the center, and G above. These are the 3 fifths of the system on its masculine or major side. The fractions for A, E, and B, the middle notes of the three chords, are 4/5, 3/5, and 8/15; this too tells a tale; 5 is a new ingredient; and as 3 gives fifths, 5 gives thirds. From these two primes, 3 and 5, along with the integer or unit, all the notes of the system are evolved, the octaves of all being always found by 2. When the whole system has been evolved, the numbers which are the lengths of the strings in the masculine or major mode are the numbers of the vibrations of the notes of the feminine or minor mode; and the string-length-numbers of the minor or feminine are the vibration-numbers of the notes of the major or masculine mode. These two numbers, the one for lengths and one for vibrations, when multiplied into each other, make in every case 720; the octave of 360, the number of the degrees of the circle. [Scientific Basis and Build of Music, page 76]

Having found the framework of the major scale by multiplying F1 three times by 3, find the framework of the minor by dividing three times by 3. But what shall we divide? Well, F1 is the unbegotten of the 25 notes of the great genetic scale; B45 is the last-born of the same scale. We multiply upward from F1 for the major; divide downward from B45 for the minor. Again, B45 is the middle of the top chord of the major system, a minor third below D, the top of that chord, and the top of the whole major chord-scale, so B is the relative minor to it. Now

since the **minor** is to be seen as the **INVERSE** of the **major**, the whole process must be **inverse**. **Divide** instead of **multiply**! **Divide** from the **top chord** instead of **multiply** from the **bottom chord**. **Divide** from the **top of the minor dominant** instead of **multiply** from the **root of the major subdominant**. This will give the framework of the **minor system**, $B_{45}/3 = E_{15}/3 = A_5/3 = D_1 \frac{2}{3}$. But as $1 \frac{2}{3}$ is not easily compared with D_{27} of the **major**, take a higher **octave** of B and divide from it. Two times B_{45} is B_{90} , and two times B_{90} is B_{180} , and two times B_{180} is B_{360} , the number of the **degrees** of a **circle**, and two times B_{360} is B_{720} ; all these are simply **octaves** of B, and do not in the least alter the **character** of that **note**; now $B_{720}/3 = E_{240}/3 = A_{80}/3 = D_{26} \frac{2}{3}$. And now comparing D_{27} found from F1, and $D_{26} \frac{2}{3}$ found from B_{720} , we see that while E_{240} is the same both ways, and also A_{80} , yet $D_{26} \frac{2}{3}$ is a **comma** lower than D_{27} . This is the **note** which is the **center** of the **dual system**, and it is itself a **dual note** befittingly. [Scientific Basis and Build of Music, page 81]

The 2nd in the tune and }
the 7th in the bass, } nice.

([click to enlarge](#))

Make **middles** in the **bass** as much as possible. **Roots** and **middles**, and **middles** and **tops**, do well in arrangements; for example, F and A. [Scientific Basis and Build of Music, page 85]

HARMONICS ON THE VIOLIN.

At the **middle** of the **string** the **stopped note** and the **harmonic notes** are the same; but corresponding places above and below the **middle** give the same **harmonic**, although these places when **stopped** give different **notes**. [Scientific Basis and Build of Music, page 92]

The **middle** one of these **three chords** is called the **tonic**; the **chord** above is called the **dominant**; and the **chord** below is called the **subdominant**. The **order** in which these **three chords** contribute to form the **octave scale** is as follows:- The first **note** of the **scale** is the **root of the tonic**; the second is the [Scientific Basis and Build of Music, page 96]

dominant; and either of these **chords** may also follow the **tonic**; but when the **dominant** follows the **subdominant**, as they have no **note in common**, the **root of the subdominant** is added to the **dominant chord**, and this forms the **dominant seventh**; and when the **subdominant** follows the **dominant**, the **top of the dominant** is added to the **subdominant**, and this forms the **subdominant sixth**. The **sixth** and **seventh** of the **octave scale** is the only place these two **compound chords** are positively required; but from their modifying and resolvable **character** they are very generally used. When the **dominant** is **compounded** by having the **root of the subdominant**, its specific **effect** is considerably lower; and when the **subdominant** is **compounded** by having the **top of the dominant**, its specific **effect** is considerably higher. In the **octave scale** the **notes** of the **subdominant** and **dominant chords** are placed round the **notes** of the **tonic chord** in such a way was to give the greatest amount of **contrast** between their **notes** and the **tonic notes**. In the **tonic chord** the **note** which has the greatest amount of **specific gravity** is its **root**; and in the **octave scale** it has below it the **middle** and above it the **top of the dominant**, the two **notes** which have the greatest amount of **specific levity**; and in the **octave scale** it has above it the **middle** and below it the **root of the subdominant** - the two **notes** which the greatest amount of **specific gravity**. The **third note of the scale**, the **middle of the tonic chord**, is the **center of the system**, and is the **note** which has the least **tendency** either upwards or downwards, and it has above it the **root of the subdominant**, the **note** which has the greatest amount of **specific gravity**, and it has below it the **top of the dominant**, the **note** which has the greatest amount of **specific levity**. Thus the **root of the subdominant** is placed above, and the **top of the dominant** below, the **center of the system**; the **specific gravity** of the one above and the **specific levity** of the one below cause them to move in the **direction** of the **center**. [Scientific Basis and Build of Music, page 98]

notes attracted by **proximity** are attracted in the **direction** of the **center** of the **tonic chord**, **major** or **minor**. But if D in the **major** is attracted by C, the **root of the tonic**, then it would be moving away from the **center**. Two **notes**

which have the **ratio** of 8:9, as C and D, or two **notes** which are produced by the same **ratio** as C and D, or two **notes** where each of them is either a **root** or a **top**, as C and D, never **resolve** to each other by **proximity**. It is an invariable **order** that one of the **notes** should be the **middle** of a **chord**. [Scientific Basis and Build of Music, page 99]

The *intervening chord between the Diatonic and Chromatic systems*, B, D, F. - This **chord**, which has suffered expatriation from the society of **perfect chords**, is nevertheless as **perfect** in its own place and way as any. From its peculiar relation to both **major** and **minor**, and to both **diatonic** and **chromatic** things, it is a specially interesting **triad**. F, which is the **genetic root** of all, and distinctively the **root of major subdominant**, has here come to the **top** by the **prime 2**. D, here in the **middle**, is diatonically the **top of the major dominant**, and the **root of the minor subdominant**; and on account of its **self-duality**, the most interesting **note** of all; begotten in the great **genesis** by the **prime 3**. B, the last-begotten in the **diatonic genesis**, **top of the diatonic minor**, **middle of the dominant major**, and begotten by the **prime 5**, is here the **quasi root** of this **triad**, which in view of all this is a remarkable summation of things. This B, D, F is the *mors janua vitae* in **music**, for it is in a manner the **death** of **diatonic chords**, being neither a **perfect major** nor a **perfect minor chord**; yet it is the **birth** and **life** of the **chromatic phase** of **music**. In **attracting** and **assimilating** to itself the **elements** by which it becomes a full **chromatic chord**, it gives the **minor dominant** the **G#** which we so often see in use, and never see explained; and it gives the **major subdominant** a corresponding **A?**, less frequently used. It is quite clear that this **chromatic chord** in either its **major phase** as B, D, F, **A?**, or its **minor phase** as **G#**, B, D, F, is as natural and legitimate in **music** as anything else; and like the **diatonic chords**, **major** and **minor**, it is one of **three**, exactly like itself, into which the **octave of semitones** is perfectly divided. [Scientific Basis and Build of Music, page 101]

Six **Octaves** required for the **Birth** of the **Scale**

EXPLANATION OF PLATES.

[BY THE EDITOR.]

PLATE I.

"NATURE'S GRAND FUGUE."

THIS plate is a **Pendulum** illustration of the **System of musical vibrations**. The circular lines represent **Octaves** in **music**. The thick are the **octave** lines of the **fundamental note**; and the thin lines between them are lines of the other six **notes** of the **octave**. The **notes** are all on lines only, not lines and spaces. The **black dots** arranged in these lines are not **notes**, but **pendulum oscillations**, which have the same **ratios** in their slow way as the **vibrations** of **sounding instruments** in the much quicker region where they exist. The **center circle** is the **Root of the System**; it represents F1, the **root of the subdominant chord**; the second thick line is F2, its **octave**; and all the thick lines are the rising **octaves** of F, namely 4, 8, 16, 32, and 64. In the **second octave** on the fifth line are **dots** for the three **oscillations** which represent the note C3, the **Fifth** to F2, standing in the **ratio** of 3 to 2; and the corresponding lines in the four succeeding **Octaves** are the **Octaves** of C3, namely 6, 12, 24, and 48. On the third line in the **third Octave** are 5 **dots**, which are the 5 **oscillations** of a **pendulum** tuned to swing 5 to 4 of the F close below; and it represents A5, which is the **Third** of F4 among **musical vibrations**. On the first line in the **fourth Octave** are 9 dots. These again represent G9, which stands related to C3 as C3 stands to F1. On the seventh line of the same **octave** are 15 **dots**; these represent the **vibrations** of E15, which stands related to C3 as A5 stands to F1. On the sixth line of the **fifth Octave** are 27 **dots**, representing D27, which stands related to G9 as G9 stands to C3, and C3 also to F1; it is the **Fifth** to G. And last of all, on the fourth line of the **sixth Octave** are 45 **dots**, representing B45, which, lastly, stands related to G9 as E15 stands to C3, and A5 to F1; it is the **Third** to this **third chord** - G, B, D. The **notes** which arise in each **octave** coming outward from the **center** are repeated in a double **number** of **dots** in the following **Octaves**; A5 appears as 10, 20, and 40; G9 appears as 18 and 36; E15 appears as 30 and 60; D27 appears as 54; and last of all B45 only appears this once. This we have represented by **pendulum oscillations**, which we can follow with the **eye**, the **three chords of the musical system**, F, A, C; C, E, G; and G, B, D. C3 is from F1 multiplied by 3; G9 is from C3 multiplied by 3; these are the three **Roots** of the **three Chords**. Their **Middles**, that is their **Thirds**, are similarly developed; A is from F1 multiplied by 5; E15 is from C3 multiplied by 5; B45 is from G9 multiplied by 5. The **primes 3 and 5** beget all the new **notes**, the **Fifths** and the **Thirds**; and the **prime 2** repeats them all in **Octaves** to any extent. [Scientific Basis and Build of Music,

PLATE II.
THE GENESIS.

In Fig. 1, the **mathematical framework** of the **scales major** and **minor**, is shown the **genesis of the scale**. F1, in the top figure, is multiplied by 3, and that by 3, and that by 3, which brings us to D27, **top of the major dominant**. F1 is the **root** of the whole system. C3 is the **top** of the first **chord**, and from that grows the next, and from that the next; and so we have F, C, G, and D, the **tops** and **roots** of the **major system** of **chords**. When these 3 **roots** are each multiplied once by 5, the **middles** of the **chords** are found, as shown - A, E, and B; so B is the last-born of the **major** family. When B is taken 4 **octaves** higher at the number 720 and divided by 3, and that by 3, and that by 3, we get the **notes** E, A, and D, which are the **roots** and **tops** of the **minor system** of **chords**. Dividing B, E, and A each by 5 once, we get the **middles** of the 3 **minor chords**, as shown. [**Scientific Basis and Build of Music**, page 103]

When **Leonhard Euler**, the distinguished mathematician of the eighteenth century, wrote his essay on a **New Theory of Music**, Fuss remarks - "It has no great success, as it contained too much **geometry** for musicians, and too much **music** for geometers." There was a reason which Fuss was not seemingly able to observe, namely, that while it had hold of some very precious musical **truth** it also put forth some **error**, and **error** is always a hindrance to true progress. **Euler** did good service, however. In his letters to a German Princess on his **theory of music** he showed the true use of the **mathematical primes 2, 3, and 5**, but debarred the use of **7**, saying, "Were we to introduce the **number 7**, the **tones** of an **octave** would be increased." It was wise in the great mathematician to hold his hand from adding other **notes**. It is always dangerous to offer strange **fire** on the **altar**. He very clearly set forth that while 2 has an unlimited use in producing **Octaves**, 3 must be limited to its use **3 times** in producing **Fifths**. This was right, for in producing a **fourth Fifth** it is not a **Fifth** for the **scale**. But **Euler** erred in attempting to generate the **semitonic scale** of **12 notes** by the use of the **power of 5** a second time on *the original materials*. It produces **F#** right enough; for D27 by 5 gives 135, which is the **number** for **F#**. D27 is the **note** by which **F#** is produced, because D is right for this process in its *unaltered* condition. But when **Euler** proceeds further to use the **prime 5** on the **middles**, A, E, and B, and **F#**, in their original and unaltered state, he quite errs, and produces all the **sharpened notes** *too low*. **C#** for the **key of D** is not got by applying 5 to A40, as it is in its **birthplace**; A40 has already been altered for the **key of G** by a **comma**, and is $A40 \frac{1}{2}$ before it is used for producing its **third**; it is $A40 \frac{1}{2}$ that, multiplied by 5, gives $C\#202 \frac{1}{2}$, not C200, as **Euler** makes **C#**. Things are in the same condition with E before **G#** is wanted for the **key of A**. **G#** is found by 5 applied to E; not E in its original and unaltered state, E30; but as already *raised a comma* for the **key of D**, $E30 \frac{3}{8}$; so **G#** is not 300, as **Euler** has it, but $303 \frac{3}{4}$. **Euler** next, by the same erroneous methods, proceeds to generate **D#** from B45, its **birthplace number**; but before **D#** is wanted for the **key of E**, B has been raised a **comma**, and is no longer B45, but $B45 \frac{9}{16}$, and this multiplied by 5 gives $D\#227 \frac{13}{16}$, not D225, as **Euler** gives it. The last **semitone** which he generates to complete his **12 semitones** is **B?**; that is **A#**, properly speaking, for this series, and he generates it from **F#135**; but this already altered **note**, before **A#** is wanted for the **key of B**, has been again raised a **comma** [**Scientific Basis and Build of Music**, page 107]

PLATE XI.
DIATONIC RESOLUTIONS, SIMPLE AND COMPOUND.

In the **major system**, when the **tonic chord** follows the **subdominant** one, there is one **semitonic progression** to the **middle of the tonic**, and one **note in common** with the **root**, so these two **chords** are linked together in different ways. When the **tonic chord** follows the **dominant** one, there is one **semitonic progression** to the **root of the tonic**, and one **note in common** with its **top**, so these two **chords** also are linked together in two different ways. When the **tonic chord** follows the **compound dominant**, *i.e.*, the **dominant seventh**, there are two **semitonic progressions**, one to the **middle** and one to the **root**, and one **note in common** with its **top**, so these two are linked together in the same two ways; but the **semitonic progression** being double gives this **resolution** great **urgency**. And now we come to the two **chords**, the **subdominant** and **dominant**, which have no **note in common**, and must, when they succeed each other, be helped to come together. **Nature** teaches us how this is to be done

by a [process of borrowing and lending](#) which will establish between them a similar [relationship](#) to that which keeps the [continuity](#) of the other [chords](#) in [succession](#). We have seen that the [top of the subdominant](#) and the [root of the tonic](#) are a [note in common](#) to these [chords](#), and so the [top of the tonic](#) and the [root of the dominant](#) also are a [note possessed in common](#) by these two [chords](#). In like manner in this [disjunct part](#), when the [dominant](#) follows the [subdominant](#), the [root of the subdominant](#) is lent to the [top of the dominant](#), and thus they come to have a [note in common](#). The [top of the](#) [[Scientific Basis and Build of Music](#), page 111]

PLATES XVII. & XVIII.
CHROMATIC RESOLUTIONS, MAJOR AND MINOR.

These two plates show the [chromatic chord resolving](#) into the [twelve major](#) and [twelve minor tonic chords](#) of the [twenty-four scales](#). There seems to be twenty-five, but that arises from making [G?](#) and [F#](#) in the major two [scales](#), whereas they are really only one; and the same in the [minor](#) series, [E?](#) and [D#](#) are really one [scale](#). C in the [major](#) and A in the [minor](#), which occur in the **middle** of the series, when both [sharps](#) and [flats](#) are employed in the [signatures](#), are placed below and outside of the circular [stave](#) to give them prominence as the types of the [scale](#); and the first [chromatic chord](#) is seen with them in its [major](#) and [minor form](#), and its typical manner of [resolving](#) - the [major form](#) rising to the [root](#), and falling to the [top](#) and **middle**; the [minor form](#) falling to the [top](#), and rising to the [root](#) and **middle**. The [signatures](#) of the [keys](#) are given under the [stave](#). [[Scientific Basis and Build of Music](#), page 116]

See Also

[center of the system](#)
[center](#)
[fulcrum](#)
[middle chord](#)
[middle in the majors](#)
[middle in the minors](#)
[middle of the dominant](#)
[middle of the major subdominant](#)
[middle of the minor dominant](#)
[middle of the subdominant minor](#)
[seesaw](#)
[tonic chord](#)