prime

noun: a number that has no factor but itself and 1
adjective: of or relating to or being an integer that cannot be factored into other integers
prime a pump

Ramsay
"In the third comparison and combination of the three primary ratios, 1/27 is the unit of quantities, and 9 is the **unit of motions**; and the same **primes** and the same process, again as before, will give the same relative quantities; and in this increasingly rapid range of oscillations the motions will be 9, 18, 27, and 45, compared with the original unit." [Scientific Basis and Build of Music, page 16]

"These three combinations of the three primary ratios, when taken together with 1 as unity, produce ten different quantities and motions - 1, 2, 3, 5, 6, 9, 15, 18, 27, and 45; and by producing the octaves of these **primes** and products, dividing by 4 for the quantities, and multiplying by 2 for the motions[2] up to 64, we have 15 additional quantities and motions - 4, 8, 10, 12, 16, 20, 24, 30, 32, 36, 40, 48, 54, 60, and 64." [Scientific Basis and Build of Music, page 16]

"The ratio of 1:2 is essentially simple in its character, and any power of the **prime** 2 always produces a note like itself. It is a law in musical science that doubling or halving a number never changes its character. Whatever ratios and notes are produced from the first power, the square, and the cube of any number, the same kind of ratios and notes will be produced, in the genesis of octaves, by the doubles or halves of that number. On this account the **prime** 2 has unlimited powers in producing notes, and is used in the first place in getting a series of octaves from 1 as unity;" [Scientific Basis and Build of Music, page 26]

"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]

"centrifugal force. A third note produced by the **prime** 5 is derived from the note produced by the first power of 3, and this note by the first power of 5 having being slightly acted on by the force of gravity, and the first power of 5 having only a little centrifugal force, the result is that this note E in the scale of C, derived from the first power of 3 by the **prime** 5, is balanced between the two forces. It is the only note in the system which in the octave scale has not a large interval on the one side of it nor on the other, and consequently it is the only note which attracts and is attracted by two notes from proximity. Thus it is that the musical system is composed of three notes having specific gravity and three having specific levity or bouyancy, and one note, E, the center of the tonic chord, balanced between these two forces. As the attractions of notes from proximity take place when the notes with downward tendency meet the note with upward tendency, had the notes been animated by only one of these forces there could have been no system of resolutions of the notes either in melody or harmony; they would all have been by gravity weighing it downwards, or by levity soaring upwards." [Scientific Basis and Build of Music, page 28]

"lower effect than the fifth; the seventh, B, has a higher effect than the sixth; but the eighth, C, has a lower effect than the seventh. If the effects of notes or chords depended wholly on the mathematical **primes** by which they are measured and located, or the ratios inherent in them, then the effects of the tonic, subdominant, and

dominant chords would have been alike, for these chords are measured by exactly the same **primes**, and have exactly the same ratios. It is the position of the tonic chord which gives it its importance and not any special **primes** by which it is produced, nor any special ratios inherent in it. Notes by the power of 2 have a pure unmixed and invariable character. Notes by the first, second, and third powers of 3 have different degrees of centrifugal force; and the character of the notes produced by the first power of 5 depends on the character of the notes from which they are derived. The final character of notes and chords is determined by the amount of force which they have acquired from the way in which they have been derived, and from their position in the system. And no matter where these notes may be afterwards placed, like chemical elements, they never lose their original forces and tendencies. What Tyndal says of the inorganic chemical elements of the brain is true of the inorganic notes of music, "They are all dead as grains of shot." It is the organic state which gives the notes and chords their gravities and (levity|levities, and these two tendencies, the one upward and the other downward, constitute the vital principle of music. It is true that the mathematical operation is required to give birth and life to music, and that the mathematical system gives the knowledge of causes down to the law of gravitation, yet the artistic effects are fully realised from the tempered system deriving its organic harmony from this vital principle of music. The centrifugal tendencies of the notes of the subdominant, are too strong to be at all disturbed by the system being tempered. The enormous power of these chords corrects the effect which might otherwise arise from tempering, as the enormous power of the sun corrects the perturbations of the planets." [Scientific Basis and Build of Music, page 29]

When we have got F1, and from it C3 and A5 by the **primes** of 3 and 5 multiplying 1, then all the octaves of the these three notes will be found by the **prime** 2, multiplying by it for the higher, and dividing by it for the lower octaves. When from C3 we have got G9 and E15, multiplying by the **primes** 3 and 5, then the octaves of these are also found by the **prime** 2, used again in the same way. And when from G9 we have got D27 and B45 by the **primes** 3 and 5, the octaves of these are also found by the **prime** 2. The **prime** 2 has an unlimited use; the **prime** 3 is used in the first power, the square, and the cube; the **prime** 5 in the first power only. Thus is evolved the true major scale, and no need for a B? or any other tinkering. [Scientific Basis and Build of Music, page 31]

See Also

Cube
factoring
Indig Numbers
Number
prime Fraction Equivalent
prime Neutral Center
Square
three mathematical primes