system of musical vibrations

Ramsay

"On December 24th, 1845, Mr. Ramsay announced to the people of Rothesay that he intended to open classes for the teaching of the science of music, commencing with the musical scale mathematically demonstrated as being the result of a **System of vibrations** which constitutes the basis of music, and accounts for every musical phenomenon of sound. Thus, by treating music in its origin, and viewing it not only in detached parts, but treating it as a whole, he would remove a multitude of unmeaning terms in common use, such as "imperfect" and "superfluous intervals," "discords," etc., etc., which tend to mystify and impede the learner's progress." [Scientific Basis and Build of Music, page 8]

"The nature of anything is seldom to be discovered in the thing itself;" it is in its relations to other things that we penetrate into and discern its true nature. According to this general truth, in order to understand the musical scales we require to go back to the **system of vibrations**. And as the laws of oscillatory and vibratory motions are derived from the law of a falling body; so, in order to understand the **system of musical vibrations**, we require to go back to the primary laws of mechanics, geometry, and arithmetic." [Scientific Basis and Build of Music, page 15]

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, page 102]

When Ramsay gave a course of lectures in Glasgow, setting forth "What constitutes the Science of Music," his lecture-room was hung round with great diagrams illustrating in various ways his findings; an ocular demonstration was also given of the **system of musical vibrations** by his favorite illustration, the oscillations

of the Silent Harp of Pendulums. A celebrated teacher of music in the city came to Mr. Ramsay's opening lecture, and at the close remained to examine the diagrams, and question the lecturer, especially on his *extension of the harmonics to six octaves*. Having seen and heard, this teacher went and shortly after published it without any acknowledgment of the true authorship; and it was afterwards republished in some of the Sol-Fa publications, the true source unconfessed; but our plagarist stopped short at C, the top of the tonic, instead of going on to F, the sixth octave of the root of all; the effect of this was to destroy the unity of the great chord. The 22 notes instead of 25, at which this teacher stopped, allowed him, indeed, to show the natural birthplace of B, which Ramsay had pointed, but it beheaded the great complex chord and destroyed its *unity*. If C, the root of the tonic, be made the highest note, having quite a different character from F, it pronounces its character, and mars the unity of the great chord. Similar diversity of effect is produced by cutting off only two notes of the 25 and stopping short at D, the top of the dominant; and also, though in a weaker degree, by cutting off only one note of the 25 and stopping at E, the middle of the tonic; this, too, disturbs the unity of the fundamental sound. [Scientific Basis and Build of Music, page 111]

See Also

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musical system