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A THEORY OF EVOLVING TONALITY

by Joseph Yasser

I believe I have some good thoughts on this work although they may be badly put down. The first section on the pentatonic scale is scholarly and well-documented, ^αfrom ~~which~~ I ~~have~~ gained information I may often find valuable ~~and~~ which I could not have gotten first-hand without extensive research.

The ~~whole~~ book could easily have been accomplished in a fourth the space. Not only is there repetition of ideas but much unnecessary verbiage. The footnotes and diagrams were especially valuable. The latter should have required little explanation.

As for his evolution of tonality, if one accepts Siamese 7-tone temperament as the ideal primitive musical system, and interprets 12-tone temperament as a development of that, then Yasser's plan for a future system is well-founded and logical. He wonders, after the Chinese first hit on 12-tone equal temperament and propounded the first formula for its tuning, that they persisted in theorizing and playing in true fifths.

The organic growth of scales, all of which should be tempered, ^{he contends,} Yasser traces this way: sub-infra-diatonic scale--2 regular degrees plus 3 auxiliary degrees equals 5; infra-diatonic scale--5 regular degrees plus 2 auxiliary degrees equals 7; diatonic scale-- 7 plus 5 equals 12; supra-diatonic scale--12 plus 7 equals 19. ~~In the plan there~~ is an obvious correlation of the regular degrees and the auxiliary degrees of the next scale used.

$$\begin{array}{r} 2 + 3 = 5 \\ \times \\ 5 + 2 = 7 \\ \times \\ 7 + 5 = 12 \\ \times \\ 12 + 7 = 19 \end{array}$$

The musical theory and philosophy of the Greeks, following the Pythagorean scale built from successive $3/2$ s, or fifths, developed scales from other intervals, notably the $5/4$. These theories and philosophies, thru the medium of Church modes, are the root of European musical culture, and are still such despite the adoption of 12-tone temperament. This, in his pentatonic premise, diatonic analysis, and supra-diatonic conclusion Yasser ignores. He does outline the process (page 270), but it has no part in the building of his scale.

If one excludes the fundamental, fourth and fifth as a scale then the simplest possible musical scale is the pentatonic (the author calls it "infra-diatonic"), constructed of four successive fifths, no matter which of the five is called tonic. The Siamese scale, which the author considers the perfect primitive pattern, tempers 7 tones to the octave to allow transposition of their pentatonic melodies. The complete story in this regard is that in the process of tempering the true fifths ~~of~~ ~~the~~ are altered by as much as $2/3$ of a semitone. ~~Scotch~~ That Scotch pentatonic tunes have been recognized when played in the system, as he says, does not admit the part rhythm and tempo play in recognizing melodies. I firmly believe that if Yankee Doodle were played with every interval distorted as much as $2/3$ of a semitone, but in the ordinary rhythm and tempo, it would be recognized instantly from Mexico to Pawtucket. With such distortion the right of 7-tone temperament to claim origin in successive fifths is quite debatable.

The possibility of representing 12-tone temperament as a succession of fifths is more valid, since the necessary flattening of each fifth is much less, but still trying to sensitive ears in all it implies. However, to hold that 12-tone temperament has its origin in such a system is denying not only the musical philosophies of Archytas, Ptolemy, Zarlino, Mersenne and Rameau, but the instinctive faculty of the ear in being most pleased with the simplest intervals. If that were not so, the

octave, the interval 2/1, would have no place in musical systems. A 12-tone scale of successive fifths, untempered, very obviously is far off from the simplest possible intervals.

Yasser states four rather interesting reasons for championing equal temperament, at least one of which is novel.

The first is that the ear quickly adjustsh itself to artificial intonations. (Perhaps some ears do, but I can't imagine any ear adjusting itself to a distorted octave.) That artificial intonations should therefore become a musical principle, or a musical excuse, follows by inference. I cannot help but wonder at the author's great labor, in view of this feeling, to show the origin of scales in successive fifths. If any deliberately created intonation is aurally possible then one need not concern himself that there is such a thing as a 3/2 ratio.

Thruout the history of music temperament has been adopted as a last expedient solution to a desperate problem in tuning, modulation and transposition. Historically, it is impossible to defend it except from the point of expediency.

Second, the view is stated that intervals are not recognized by absolute acoustic value, but by their their relation in a scale. The burden of proof is on Yasser, and he leaves it there. It may often be true but often not. I am inclined to think that if a person were of a mind to sing a perfect fifth from a given tone he would sing it, whether it occurred in his accustomed scale or not. The probability might vary with different intervals. Again, as in the first argument, the author jumps to the desired conclusion from a pure assumption.

The third reason, that "temperament in no way impairs the inherent qualities of a scale" is proved in the author's mind by the Scotch airs played in the Siamese musical system, spoken of before. He previously stated, with good insight, that nothing better revealed the character of an interval than its vibrational ratio. Does he now imply

that variations of $\frac{2}{3}$ of a semitone do not alter the character of an interval? or that intervals are not the "inherent qualities of a scale"?

The fourth is, I believe, the first reason I have ever heard advanced in behalf of equal temperament which is not negative. It is that it has positive artistic advantages--that the major mode becomes more major, and the minor mode more minor. The difference between the true and tempered third, either major or minor, is exactly $\frac{1}{7}$ of a semitone. Argument one, that the ear quickly adjusts itself to artificial intonation, even to as much as $\frac{2}{3}$ of a semitone variation, argument two, that the absolute acoustic value is less important than the recognized scale degree relation, and argument three, that inherent qualities are not altered in deliberate changes in intonation, seem to damn argument four and its "positive artistic advantages" singly and collectively.

It is a little difficult to see just what aid will accrue to science from the hypothetical 2-tone sub-infra-diatonic scale (with 3 auxiliary degrees), its exposition covering 14 pages of close type. Maybe it will hypothetically redound to the aid of the paleolithic man.

Random quotations: after describing the way in which the supra-diatonic scale is built thru Pythagorean intonation (successive fifths produced within a single octave), making 12 regular and 7 auxiliary degrees (page 116): ". . . since the Pythagorean intonation would be of no practical use whatever, it does not matter in the least how closely, acoustically, the seven auxiliary degrees . . . come to its seven near-by degrees when the principle of scale formation by consecutively arranged natural fifths is applied." The next assertion is that "the Pythagorean intonation will invariably fill the function of some sort of 'common denominator' for all three scales (pentatonic, diatonic, supra-diatonic), thereby producing--so to speak-- a preliminary and rough outline of the supra-diatonic scale which then, and only then, may be

'retuned', as necessary, either to its just intonation or to its equally tempered intonation." A scale is built on "some sort of 'common denominator'" that is of "no practical use whatever" and is therefore "retuned" to one of two other intonations. In defending Siamese 7-tone temperament (page 122) the observation is made that "in problems of art actual facts have to be considered in preference to theoretical premises." The "actual facts" are that perfect fifths have been used in every nation of the world, so far as is known, untempered, and the "theoretical premises" are that because 7-tone temperament is now practiced in Siam that it should become the model for evolution of musical theory for the whole of civilization.

Continue random quotes: the 12 regular degrees of supra-tonality are "live and individual" which "character is certainly lacking in the anemic and neutralized atonal scale (12-tone temperament) since its component ~~parts~~ intervals are rigorously levelled in comparison to the series of supra-diatonic whole steps and half steps." There is a saying that if he is given enough rope a man will hang himself.

On pages 233 to 237 Yasser roughly outlines "musical monism" (corresponding to monophony). I quote from page 236; "Were musical art of rational and not of emotional origin, the division into consonances and dissonances would be unnatural. Music then would be monistic instead of dualistic, from the viewpoint of harmony. It is highly probable that it would be directly based, in that case, on the series of overtones . . ." The supplement to chapter ~~XI~~ XI, which covers 30 pages, is an exposition of supra-tonality in various types of just intonation (that is, in intonation based on overtones), none of which is actually used, but which apparently form the basis of the system's chord formations. The $7/4$ interval is called a "falsnance" in the diatonic scale (because it is false to the scale): "But the very same interval will not be a falsnance in relation to the supra-diatonic

scale because it is not only found in the just intonation of this scale (which is not actually used) but furthermore fills therein the place of a consonance . . ." The representation of a thing by a variation of it which is presumed to have the character of the unaltered thing is an equivocation consistently present thruout the treatise.

It excites wonder, first, that the author insists that Pythagorean intonation is the "constructive schema" of the three scales, when (page 140) he admits that it reveals the arrangement of the regular and auxiliary degrees "rather loosely, as far as acoustical accuracy is concerned;" and second, that in view of the admitted variation of $2/3$ of a semitone from the true in the Siamese pentatonic, and as much as half a semitone from either the Pythagorean or true intonation in the supra-diatonic, that he does not throw the whole idea of a 12-tone scale overboard but goes to such tremendous lengths to show the one as the perfect pattern and the second as the ideal for the future. Considering the continual cry against 12-tone temperament by string players, vocalists and acousticians, in which the maximum falsity is $1/7$ of a semitone, it is hard to conceive of them swallowing the 12-tone scale in 19-tone temperament. Yasser's 12-tone scale is acoustically unsubstantiated in the simple intervals that the ear can sing unaided, this entirely apart from 19-tone temperament, of which there are many advocates, which might more nearly approximate true diatonic intervals than 12--as the tables ^{seem to} indicate. The author's theme is not to create truer diatonic intervals but to evolve a new "12+7" tonal system.

Yasser says very truly that 12-tone temperament is a "limiting condition" that militates against organic growth of musical resources. And he would substitute another!

--H. P.