

To seven and beyond

“To render the classification of intervals easier, we have kept here, to represent certain intervals, the simpler ratios in which the numerical element “7” appears. From the point of view of the symbolic signification of numbers and consequently, from the point of view of physics, this is an error. In this world limited to five elements in which we live, no prime number higher than “5” can enter into the composition of the substance from which a melodic or harmonic relation is made. The Chinese system, the abstract scale of fifths, even refuses to go beyond the number 3. All its intervals are expressed in terms of powers of 2 and 3. The introduction of the factor 5 gives us the harmonic scale of which the characteristic intervals are the harmonic major sixth (5/3) the harmonic major third (5/4), the minor third (6/5), the major half tone ($16/15 = (2^4) / 3 \times 5$), the minor half tone ($25/24 = (5^2) / 3 \times (2^3)$), the comma diesis ($81/80 = (3^4) / (2^4 \times 5)$), etc..

The number 5 “humanises” music. It makes it the instrument of the expression no longer of abstract prototypes but of a tangible reality. The introduction of any higher prime number would take us beyond this reality into dangerous regions which are not within the scope of our normal perceptions and understanding. 7 is the number of the heavenly worlds as well as that of the infernal regions, and we have usually no means of knowing to which side it may lead us.

The intervals which contain the element 7 cannot be physically pleasant, being, by definition, beyond the limits of physical harmony; their magical effect also is normally beyond our control. Consequently, their utilization in music and its theory serves no useful purpose. We shall indicate some of them here merely as a reference and because they have been spoken of by many theorists past and present.” (1)

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Danielou's identification of numerical ratios in musical intervals with aspects of consciousness is an important key but his argument against using any numerical element higher than 5 is based on false reasoning. He states that since there are five elements that 5 is the highest numerical element. Now, in the Chinese system there are five elements: water, fire, wood, metal, earth; in the Greek system there are 4: earth, air, fire, water; in modern physics there are over 100 with new elements with half-lives measured in microseconds being synthesised in the laboratory every year. Which five elements is he referring to?

He is also confusing two aspects of number. Number used in a quantitative sense, to count things (there are five apples) and number representing the archetypal quality of a thing. When we listen to an interval of 6/5 we are hearing 5 as the quality of that interval. Just as when we listen to a waltz we are perceiving / moving to 3 as a quality of that rhythm.

He could equally well have said that since 5 is the limit then our limit in ratios is the first five prime numbers 1,2,3,5,7. Why not?

I agree with his assessment of 5 as humanising. Listening to music that only uses 2 and 3 to build intervals (most Chinese classical music) gives a sense of non-human timelessness, a cosmic quality. The introduction of 5 with the major third (5/4) and minor third (6/5) as main intervals brings a sense of human emotion.

Dane Rudhyar in his book “The Magic of Tone and the Art of Music” (2) (pp 97-98) gives the following example: “The difference between a Pythagorean third and a ‘natural’ third (the 5:4 ratio) could be compared to the difference between the theoretically impersonal relationship between a monk and a nun, or between any two members of an ashram, and the personal love of an ordinary man and woman.”

In fact the way to tune these intervals accurately is find their emotional resonance. Likewise 7 gives the bluenote feeling and is likewise to do with emotion. Danielou's condemnation of prime 7 as "dangerous" is quite mediaeval. Maybe he doesn't find it pleasant or consonant but there isn't anything magical or dangerous about it.

Maybe he worked out his whole analysis of the Indian Raga system using a 5 limit (and a brilliant analysis it is) and then realised that he needed a reason for excluding the higher primes.

Other analysts of the tuning of ragas such as C. Subramanya Ayyar include ratios up to 11 without problem and without incurring the risk of losing one's sanity in the upper or lower realms.

There are in fact many tuning systems where higher primes than 5 are used and used successfully. As already mentioned, in the jazz and blues traditions when a singer or a sax player bends a minor third and plays a blue note they are setting up an interval that involves 7. In the maqam tradition which is used in Arabic, Turkish, Azerbaidjani and Persian music, ratios up to 13 are common. Contemporary American composer Lou Harrison uses up to 7 and wishes he could work up to 11 and 13. Harry Partch's oeuvre uses ratios up to 11 and Anthroposophical musicologist Kathleen Schlesinger's tuning as applied by Australian composer Elsie Hamilton goes up to 13. More recently La Monte Young works regularly with primes up to 31 and beyond. I personally work up to 13 as a purely arbitrary limit for one principal reason: that I cannot *feel* the identity of intervals higher than 13.

Tuning means tuning the resonance frequency between two (or more) notes or systems. When I listen to music I resonate (physically, emotionally or spiritually) with the music. I am aware that the prime limit that I work within is arbitrary. Danielou is creating metaphysical justifications for his prime limit that have no basis in experience. They may be his reality but they are certainly not the whole story.

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(1) *Alain Daniélou: Introduction to the Study of Musical Scales p230ff. The India Society 1943 Reissued as: Music and the Power of Sound: The Influence of Tuning and Interval on Consciousness. Inner Traditions International 1965*

(2) *Dane Rudhyar: The Magic of Tone and the Art of Music. Shambhala, Boulder and London, 1982.*

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