

Thursday 27 May 1971

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Greetings from uphill----

The library had Ravi Shankar's music treatise and biography, so I took that out yesterday. Not much about the tuning, but a good deal about the rhythm-system of India.

I finally got another tape off to you, with the latest 19-tone theme and some other exhibitions of properties of the 19 system.

The principal chord is A C F A-flat minor and major at the same time. This can be played in the 12 and other systems, but it makes far less sense than it makes in 19; and so for other ~~xx~~ chords and progressions of this nature, as for instance on the 19-tone guitar, three major sixths in succession d b , g e. b g# .

I repainted my garbage can before putting it out yesterday, and the result was that some kids stole the lid. They are playing knights in armor or something, using several other people's lids besides mine, for shields.

Time to Define my Terms again, blast it. Why do I get into the habit of saying 19(-tone) system rather than 19-tone equal temperament? Because I wish to include some second- and higher-order tempered temperaments, and to include what my organ does, namely to make some fifths and other intervals just.

There is not just one second-order temperament in the 19 system; there are many. And so for the other systems. But to oversimplify things for the moment, assume this second-order temperament: On each degree of the 19-tone equal temperament one constructs a major triad with just fifth and nearly-just major third. This would not be too far from the ideal of what my organ "should" do; in fact it doesn't, but this is the general effect.

In the arid, dry-as-dust world of the philosopher, especially that of the cold, pessimistic, hardboiled mechanist, the passion for order is expressed in such forms as Occam's Razor. But in the real world out there, it doesn't work that way--for instance carbonic acid and ammonium hydroxide will not come into existence just because the super-orderly abstract theory declares that they should exist. Does it really hurt that they don't exist as un-ionized solids? Only in the mind of someone driven by this "passion for order".

Similarly, someone or other is going to be annoyed by the way the intervals of the 19-tone system do not beat as they should, on my organ, and that my 19-tone guitar is really an 18 with the bridge moved. Personally, I think all such critics are nit-pickers and damnable nuisances. Killjoys and spoilsports. As you will hear on the tapes, certain of the properties of the 19 system and its harmonic and melodic progressions come through regardless of the distorted tempered temperament. Third-order I would think.

Augusto Novaro's afinaciones are of this sort--second-order 12-tone temperaments, and he mentions similar systematic deviations from 53 and some other systems.

In the present case, first-order is 19-tone equal, second-order is building just fifths on every degree of the first-order system, and third-order is the deviations from the second order caused by failure to tune precisely and by drifting of the oscillators.

In the guitar case, first-order is again 19-tone equal, and second-order is the deviation produced by using 18 as if it were 19. Third-order would be further deviations caused by mistuning of the six strings.

In the average piano, there is more than one possible way to describe the situation.

One way goes like this: First-order is just intonation. Second-order is Pythagorean temperament. Third-order is the 12-tone equal temperament. And so on.

But to please the hidebound reactionaries, let us use this instead: First-order is the 12-tone equal temperament. Second-order is the deviation from this caused by using a tuning-routine, which produces what the German term *gleichschwebende Temperatur* ought to mean, but doesn't: a 12-tone temperament in which all the fifths ~~anaxfear~~ in the octave tenor F to middle F beat at the same rate, and all the fourths in that octave also beat at the same rate, or at least, those fifths and those fourths which are used by a given tuner in his routine, all beat at the same rate. Third-order is the stretched-octave system used by the particular tuner. Fourth-order is the resultant actual tuning say, four or six hours after the tuner has packed up and left.

Since 12-tone guitars are based on the 18/17 scheme, this is a second-order temperament.

The Hammond organ uses gearing, so this too is a second-order temperament, the deviations being greatest at the bottom of the scale.

Put woodwinds, brass, strings, and percussion (such as xylophone, glockenspiel, piano, harp, etc.) together in an orchestra and this is dis-order or pandemonium, as you prefer, and I aint foolin. To assert a purely mental abstract passion for order and to pretend that this conglomeration of heterogeneous soundmakers is playing in the 12-tone equal temperament is nonsense. Berlioz and Rimsky-Korsakoff notwithstanding.

The actual system a Moog Synthesizer is playing in I leave to your fertile imagination. It works, so why worry?

Standard Time Zones and (ugh!) Daylight Saving Time are temperaments, in a way. Perversions of the principle of order. Standard Time as a form of Occam's Razor--I never thought of that before. Next time you go shopping, look in the drugstore or department-store windows for Westclox alarm clocks. You may find that they have 48-minute hours on their dials! That's ~~ampra~~ surpassing Robert Lindber. Why am I annoyed? My sister used etiquette at me as a weapon of cruelty. That's why.

We do have some clues that some scholarly drudge should follow up: for instance, the German term *gleichschwebende Temperatur* might show, by the first authenticated quotation date, when the routine started, or at least when someone had the idea that such a routine should be invented. I could put this in my article on second-order temperaments and ask the readership to research the matter.

I wonder if H. Paul Kegley is still in Palo Alto or vicinity. He used to be in L.A.--I met him in 1947 or something like that, and had a letter from him in 1968 or 69. He was interested, during the 1940's, in meantone and stretched octaves and other such piano matters, and together with Wesley Kuhnle probably influenced Peter Yates to wrestle with the problem of 12-tone keyboard instruments getting put in meantone and all this hullabaloo about "characteristic keys" being due to the wolfishness of those keys on keyboard instruments so tuned, which crossed the G#/Eb barrier.

Having tried to teach people to set the 12-tone temperament and having answered innumerable questions about meantone and various compromise-compromises, and having listened to dozens of sad tales of woe from people who couldn't learn to tune any system, equal or not, I think I have a perspective on the question that many theorists lack. Getting down to brass tacks, it is NOT ENOUGH to figure out a temperament, or a just construction. You have to invent a routine for tuning it, a rule-of-thumb if you will, a procedure the tuner in the field can apply without going astray. Usually this will result in a deviation from the theoretical system, a second- or third-order temperament.

Even if some people do not wish to become tuners, just to be able to tell when their instrument needs another tuning, a checking-system has to be invented.

Or, to put it another way, Yates overpleads his case and assumes that Bach's contemporaries possessed chromatic stopwatches, tuning-forks checked against crystal frequency standards and electric clocks, and a practical tuning-routine taught with the precision it can be taught with today. Of course he knows better, but the writings sound that way. Also, in the appendices to An Amateur At the Keyboard, he assumes a piano tuning skill (or harpsichord tuning skill) of the casual reader, which can only be gained by a tuner-trainee after about a year's conscientious practice. That is, the difference between a 12-tone-equal tuning as the average piano-tuner can do it today, and Yates' theoretical unequal "well-tempered", and some other compromises such as Novaro's afinaciones, is so subtle that, given the crudely-built harpsichords and clavichords of Bach's time, in the average home or studio, given the rapid decrement of the tones on such instruments, and given the carelessness and errors of the tuners of those days, there wouldn't be much difference in the actual tuning effected by those persons, even though they were conscientious and had every intention of doing this or that system as well as they could at the time. Even sweeping all this aside and giving them too much Benefit-Of-The-Doubt, suppose that the Time-Traveler alighted from his Tellurian time-machine and got out his portable frequency-meter and checked a number of harpsichords and clavichords two weeks after they had been tuned.