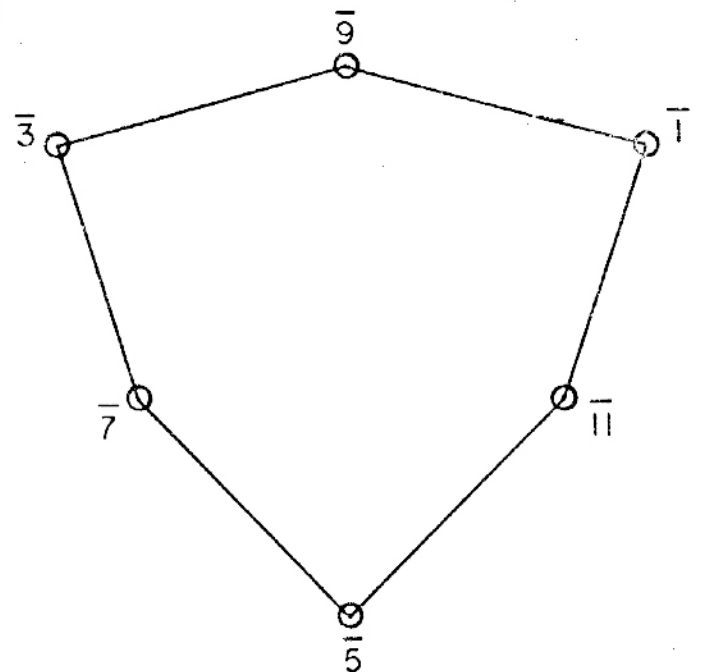
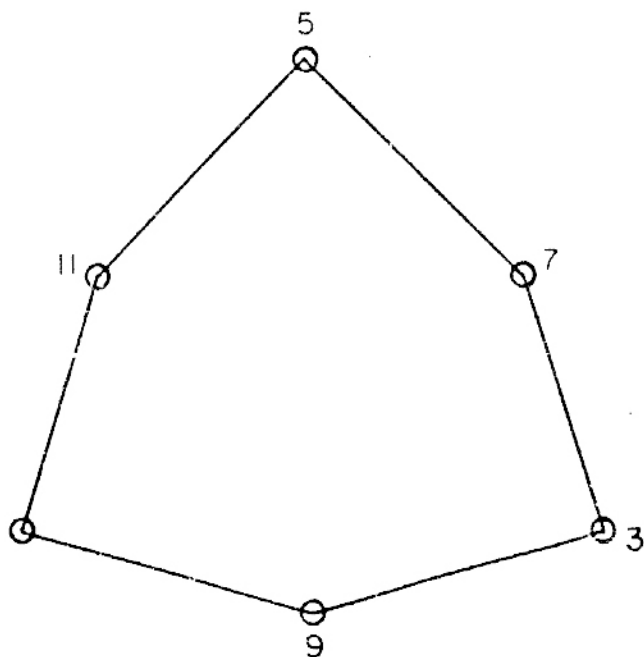
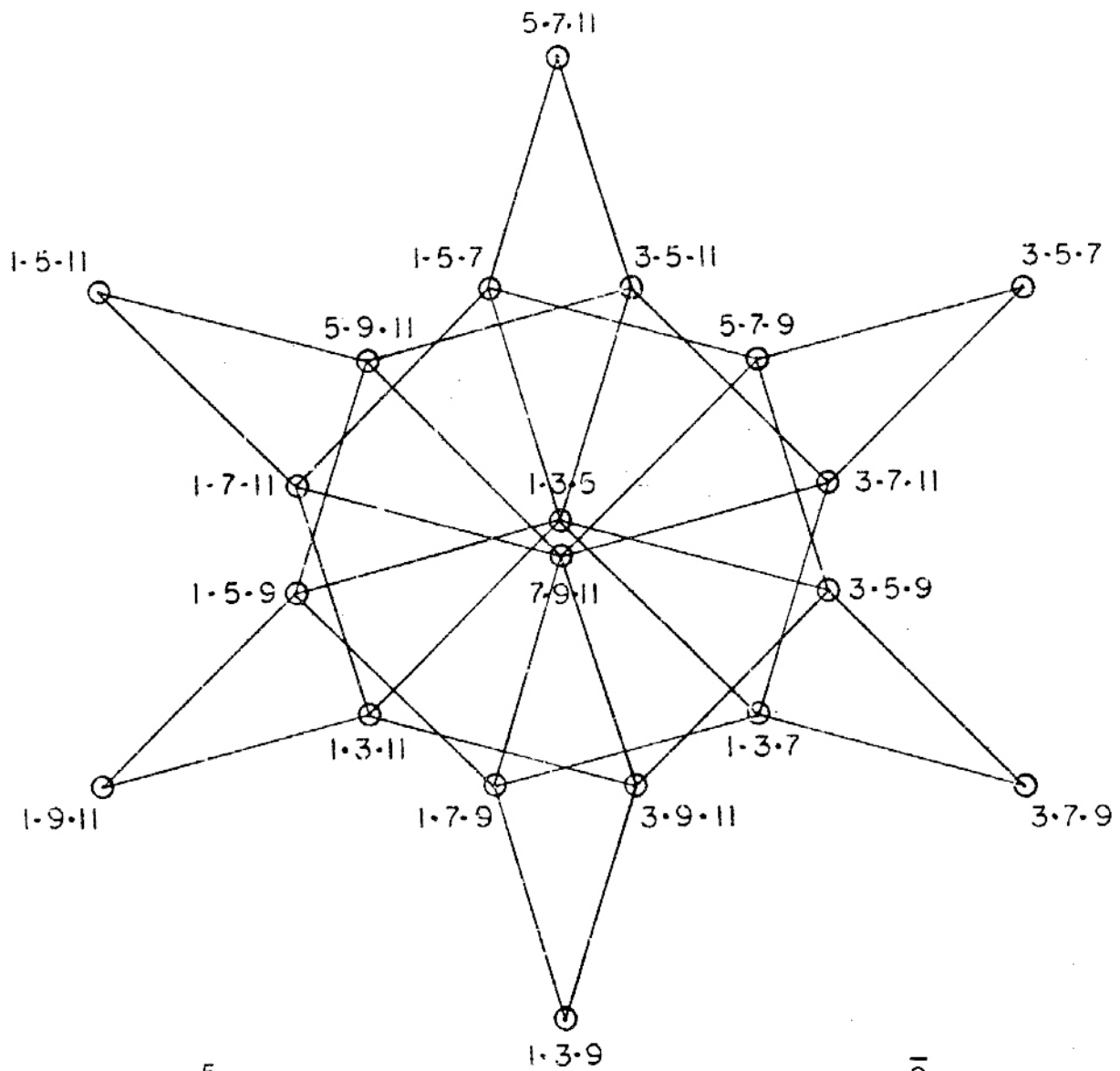


XENHARMONIKÔN IX



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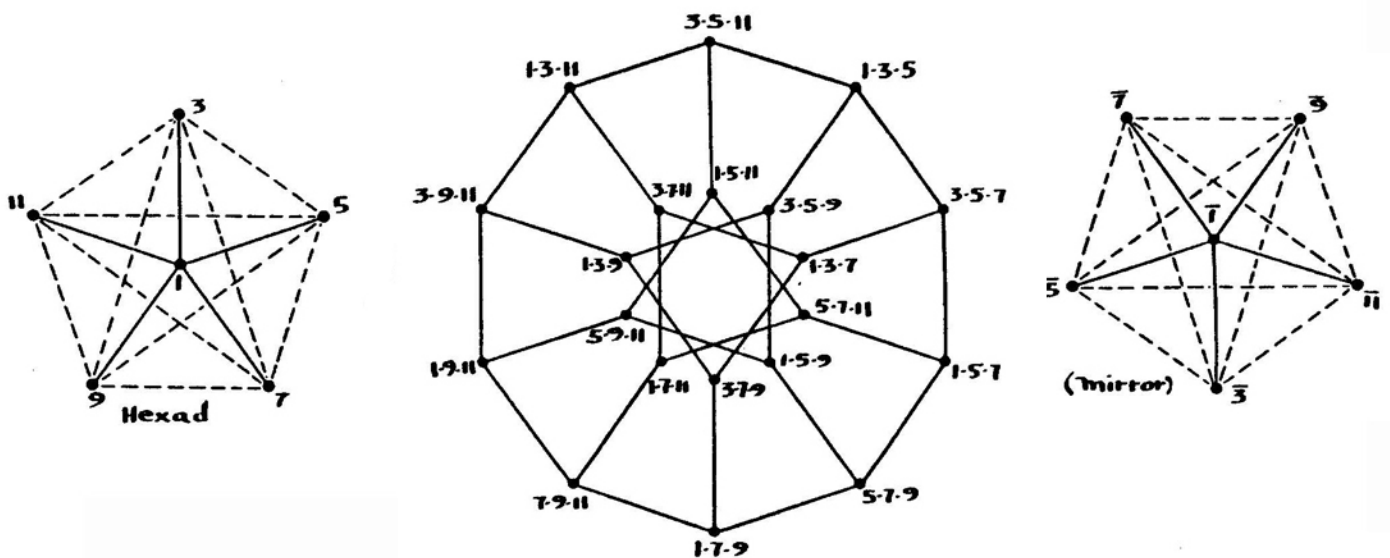
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Combination-Product Set Patterns

Kraig Grady
Los Angeles, California

In 1969, with Erv Wilson's invention of the product combination set, of which the Hexany and the Eikosany are the most familiar, Just Intonation took a giant leap forward. Here for the first time Just Intonation could not be accused of being a reactionary endeavor. Despite the important work of Harry Partch through his development of the Diamond (via Schlesinger) which forever solidified 11-limit structures, it failed to liberate the dominance of one pitch over another (one composer said that he "could always recognize Harry Partch, it was always in 'G'"). The six-tone Hexany (the two factors-out-of-four combination set) although limited in total number of pitches available, succeeds in liberating its user from a strong tonic, or even an obvious 1/1. Any tone is equally capable of becoming a tonic but unlike the twelve-tone equal-temperament structure, each tone bears a unique relationship to the rest of the members of the structure. It is not that the center is everywhere and the circumference nowhere, but more likely that one can no longer distinguish between the two. A common image that comes to mind is James Hillman's observation: "...the mind being in the imagination as opposed to the imagination in the mind." The Eikosany (the three-out-of-six combination set) is the structure I wish to discuss in detail in this paper. It reminds myself of the game of chess in that the deeper one explores its simplicity, the more unlimited it becomes as well as complex. Since Wilson's original paper on the subject, the horizon of the Eikosany has deepened considerably; for that reason, certain of these developments need to be brought forward. Since the inventory is overwhelming, this exploration will be limited by those capabilities illustrated by a centered pentad lattice of a 1-3-5-7-9-11 Eikosany. The first diagram is of such a lattice:



(Placement of the elements as shown, with 1 in the center causes all the connecting lines to be intervals with 1 as a element. Different rotations of the six elements will offer arrangements of the Eikosany. Those interested are encouraged to explore this possibility.)

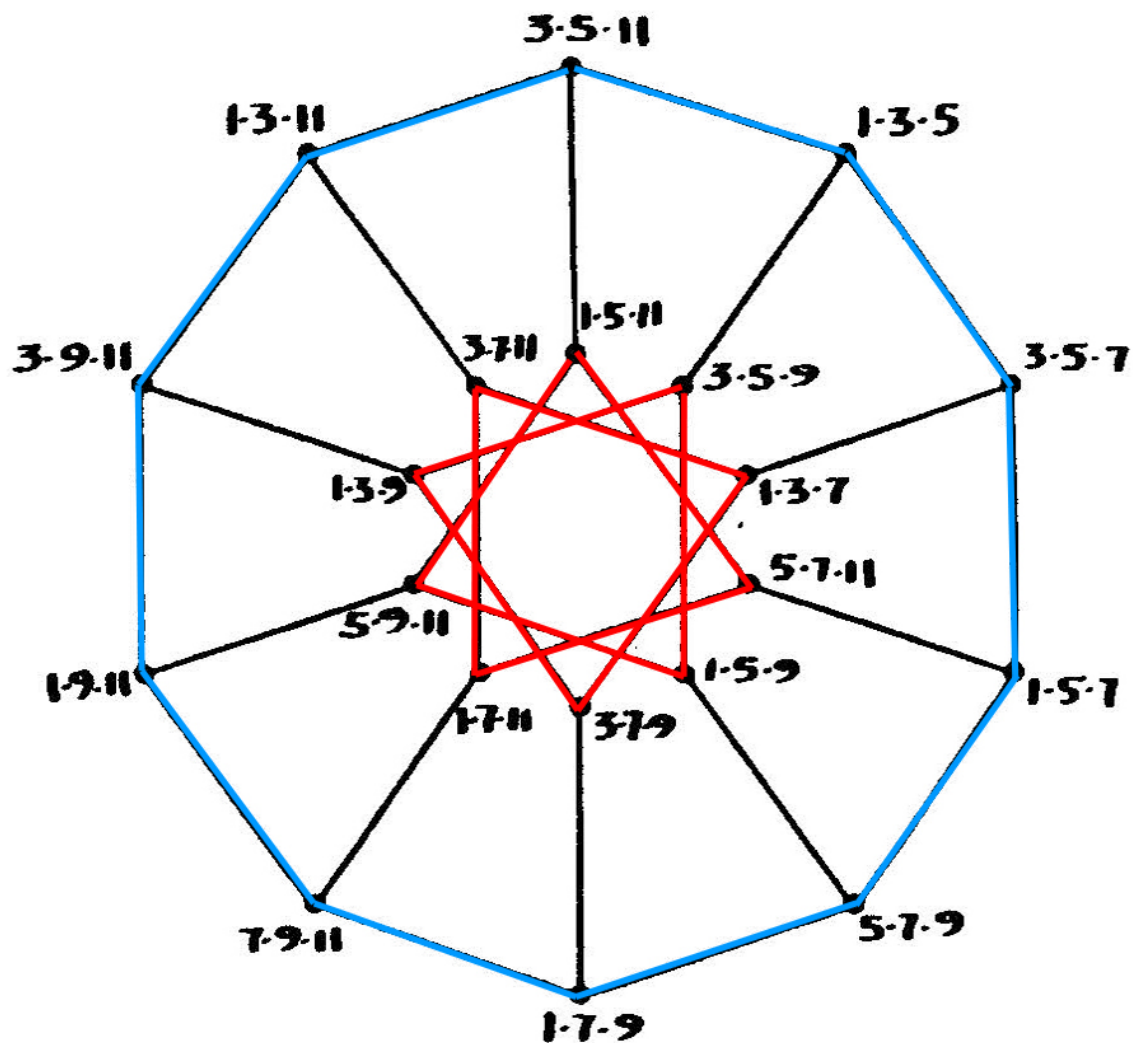
One of the first patterns discovered by Wilson soon after this structure was invented was one that he nick-named the Tree Toad. It involves the relationship of two complementary Dekagons. We refer to diagram one. For brevity, the Dekagons will be labeled A and B, the A Dekagon being formed from the outer ring of ten tones, and the B Dekagon from the inner flower of ten tones.

Dekagon A: Blue

3-5-11/1-3-5/3-5-7/1-5-7/5-7-9/1-7-9/7-9-11/1-9-11/3-9-11/1-3-11

Dekagon B: Red

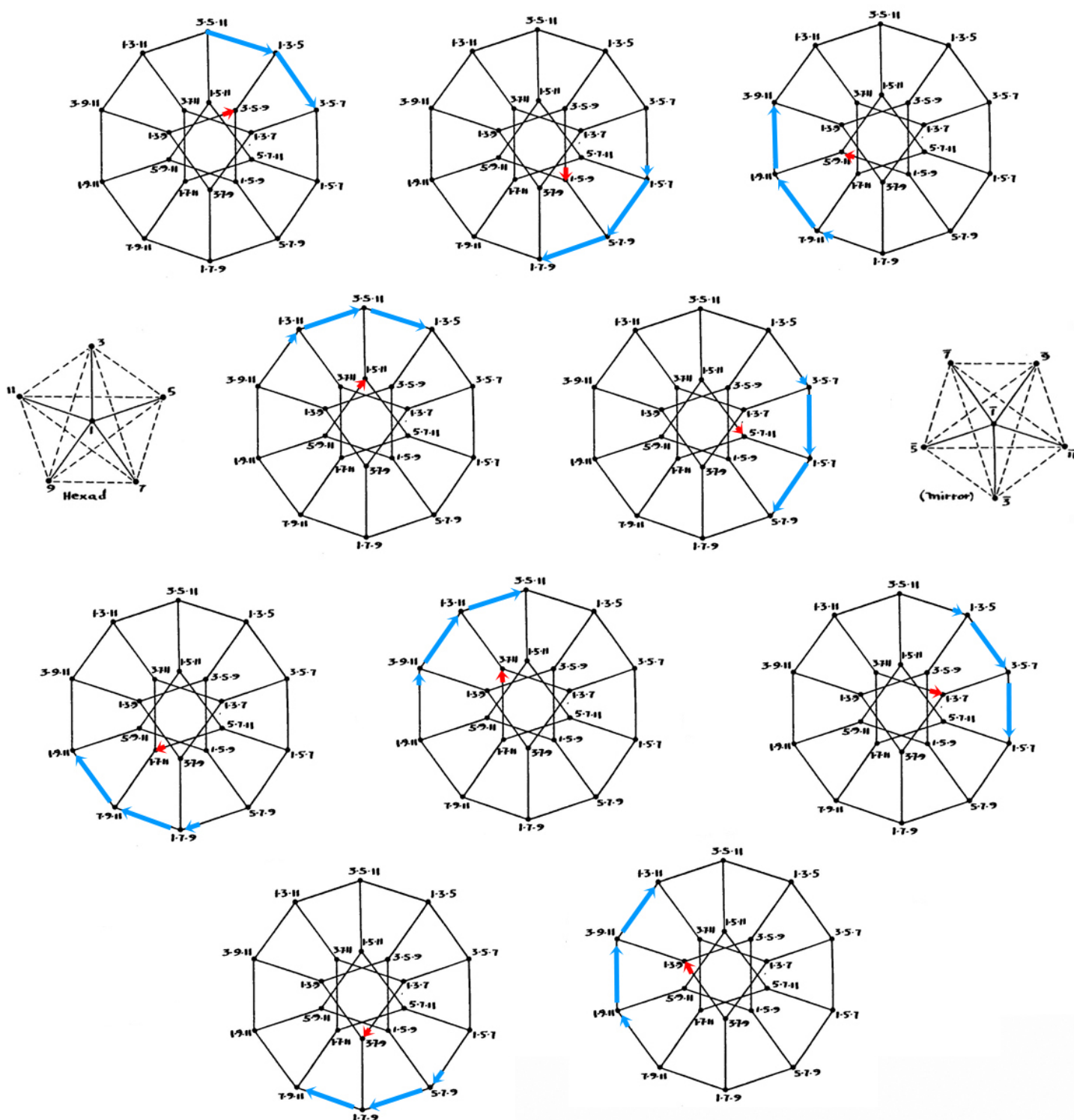
5-9-11/1-5-11/5-7-11/1-7-11/3-7-11/1-3-7/3-7-9/1-3-9/3-5-9/1-5-9



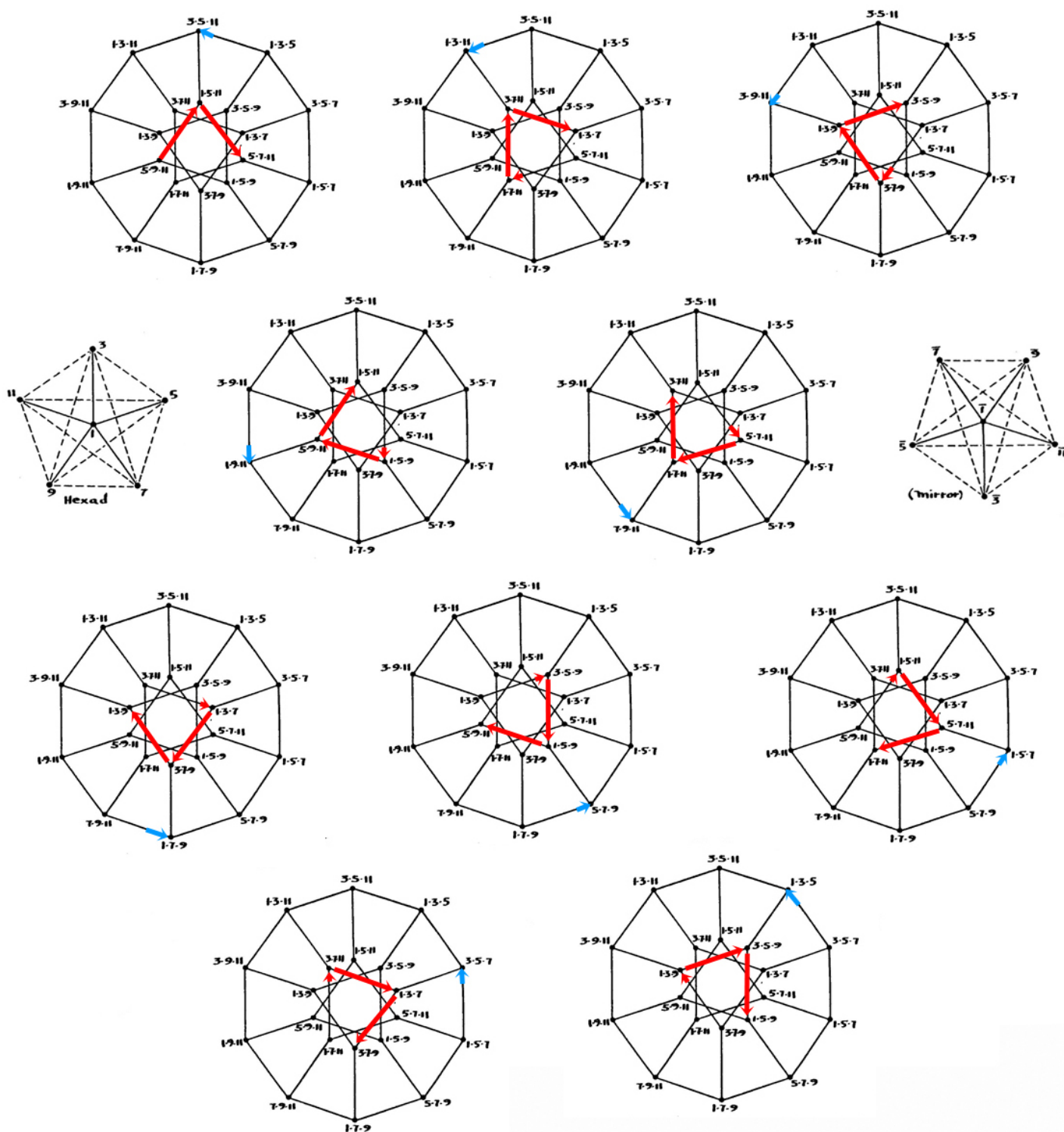
The Tree Toad has one Dekagon move three tones for every one tone of the other Dekagon forming alternating complete harmonic and subharmonic tetrads.

Two illustrations should make the process clear as well as impress one with the contrapuntal implications built in. In these examples, voice A moves three tones to every one of voice B:

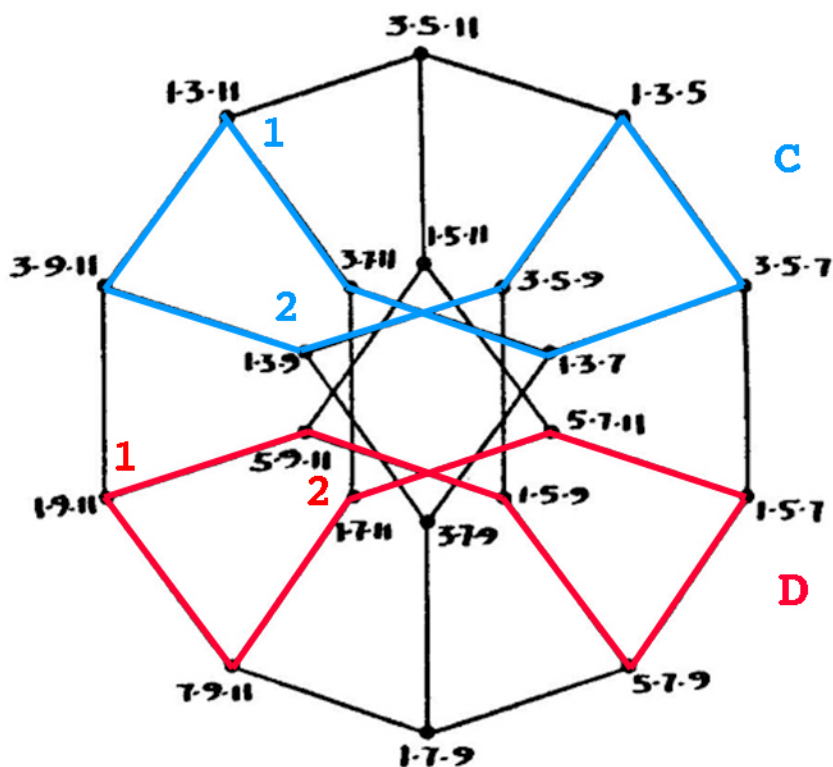
The two pentad shapes on each side can be used to figure out the tetrad formed. It should be understood that the patterns can start and end anywhere as well as change direction. Also, the forementioned rotation of the elements of the pentads will create different dekanies and/or different orders.



In this example
voice B moves three tones to every one of voice A:



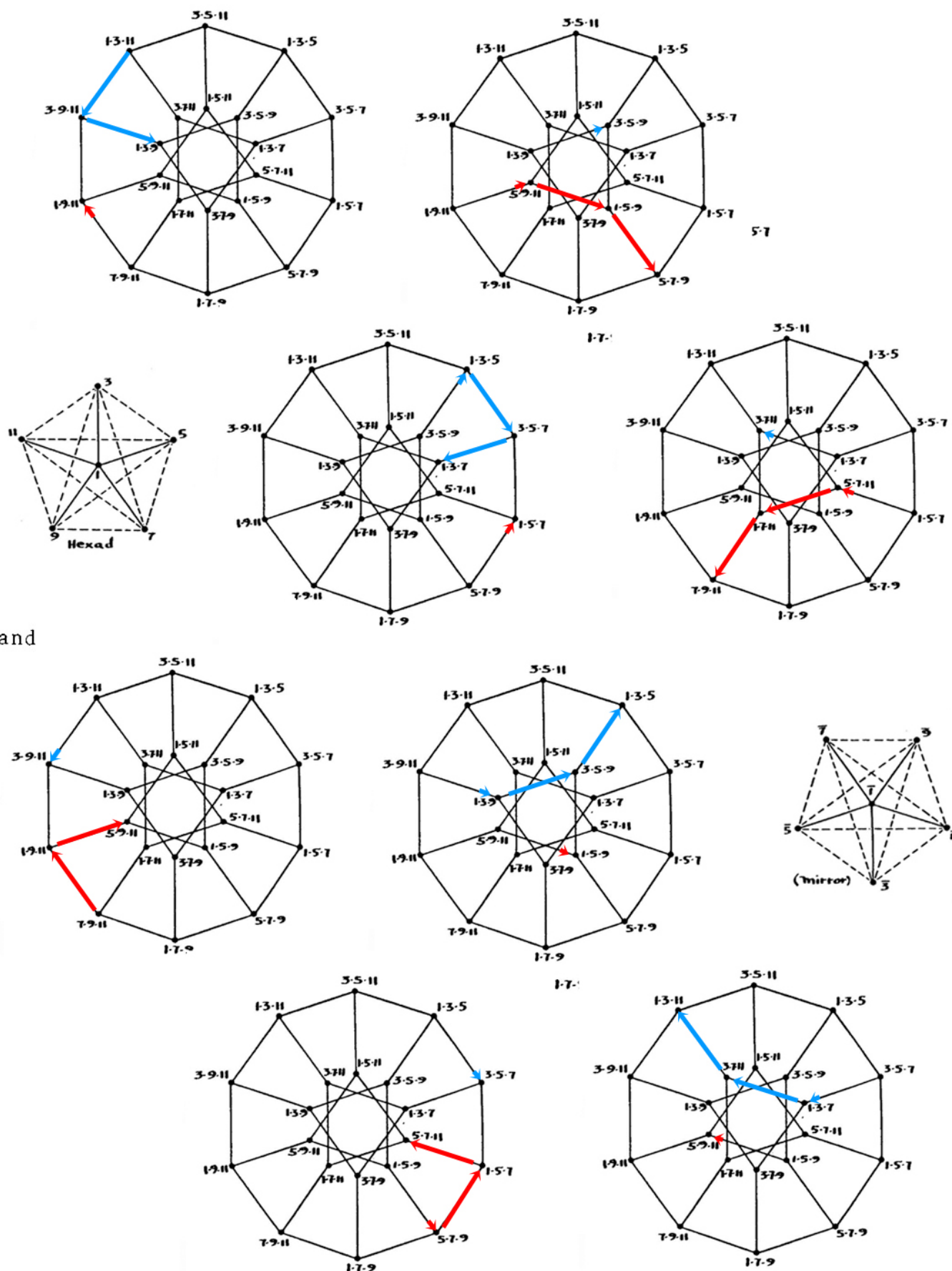
Below is another structure I stumbled upon one day of which I am fond. It contains many patterns of four (compared to the Tree Toad patterns of ten). It can be rotated 36 degrees (or an multiple thereof) for purposes of development or creating larger cycles. Here is the lattice pattern overlaying the previously used Eikosany with illustrations of patterns beneath that should be self-explanatory upon examination:



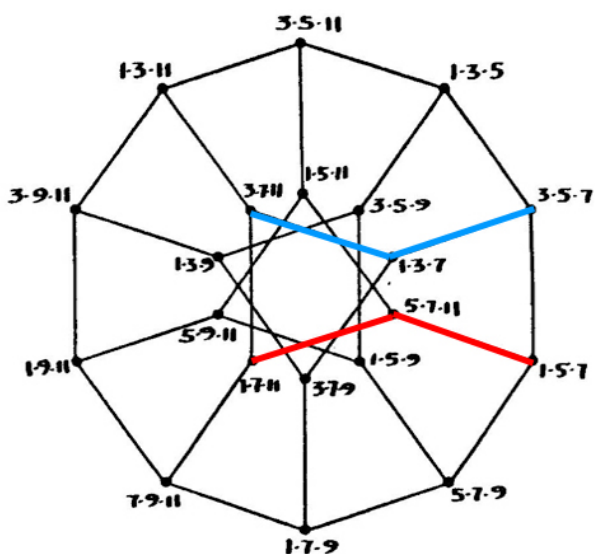
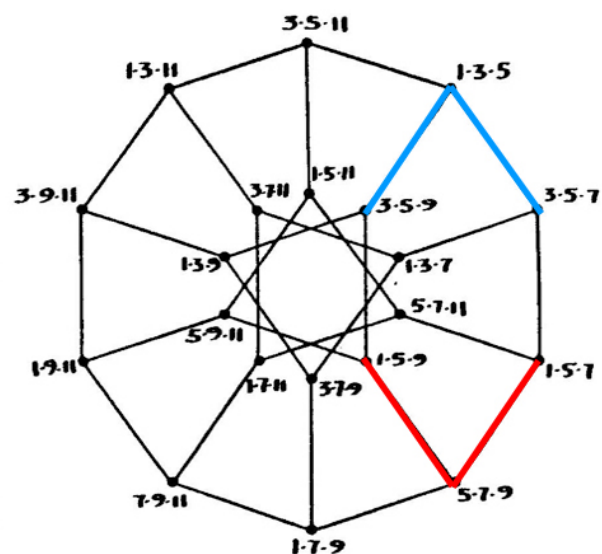
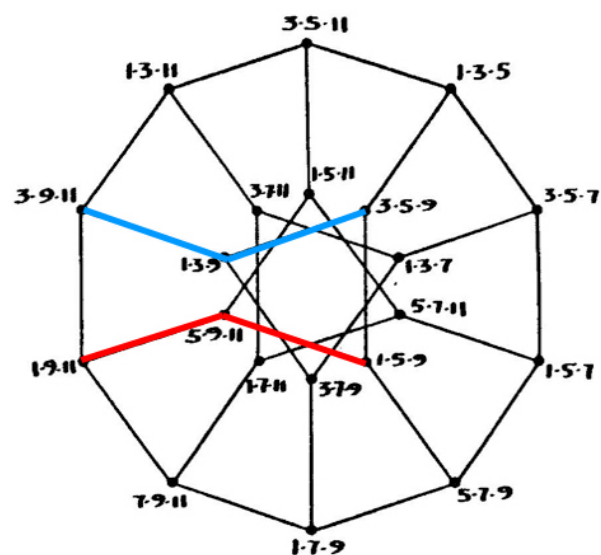
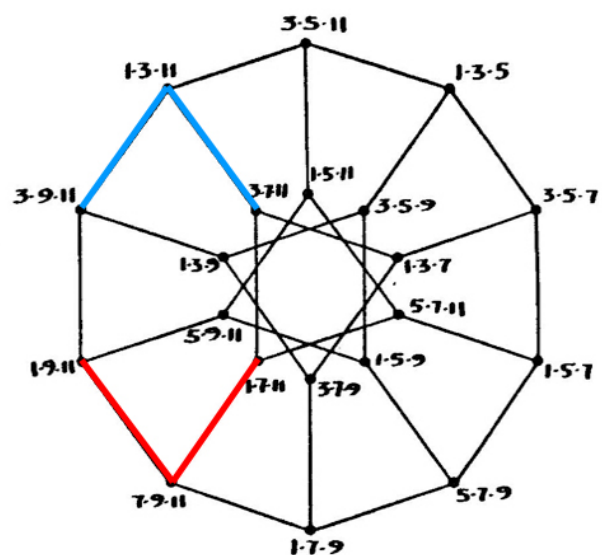
C2	1-3-9	3-5-9	1-3-5	3-5-7	1-3-7	3-7-11	1-3-11	3-9-11
C1	1-3-11	3-9-11	1-3-9	3-5-9	1-3-5	3-5-7	1-3-7	3-7-11
D1	1-9-11	5-9-11	1-5-9	5-7-9	1-5-7	5-7-11	1-7-11	7-9-11
D2	1-7-11	7-9-11	1-9-11	5-9-11	1-5-9	5-7-9	1-5-7	5-7-11

Combinations C1 & D1 or D2 will form dyads within the 11 limit
D1 & C1 or C2 will form dyads within the 11 limit
C1 & D1 & D2 will form triads within the 11 limit
D1 & C1 & C2 will form triads within the 11 limit

Alternating one note to three notes and three notes to one note patterns forming tetrads:



Patterns of three notes against three forming hexanies:



It seems best to conclude with these patterns and leave other possibilities within the Eikosany until later.

Wilson's other lattices of this structure reveal other patterns and I hope we will be able to see them in this journal from Wilson himself as well as from those others working with the Eikosany.