To obtain the formula for the infinite scale tree zigzag pattern, the continuing fraction formula for the repeated moves of 1 elements is algebraically transformed to the generalized form of the quadratic formula, which is then solved as follows:

$X_2 = u + 1/X_1$ $= u + (1/X_1)$

$X_2 = uX_1/X_1 + 1/X_1$ $= (u * X_1)/(X_1 + (1/X))$

$X_2 = (uX_1+1)/X_1$ $= (u * X_1 + 1)/X_1$

Set: $X_1 = X_2 = X$ Then:

$X = (uX+1)/X$

$X(X) = (uX+1)$

$X^2 - (uX+1) = 0$

$X^2 - uX - 1 = 0$ $* \quad X$

THIS IS NOW IN THE GENERAL FORM OF THE QUADRATIC EQUATION:
$aX^2 + bX + c = 0$

Where: $a = 1$; $b = -u$; $c = -1$

THE CLASSIC FORMULA FOR THE POSITIVE ROOT IS:

$X = ((-b) + SQRT(b^2-4ac)) / (2a)$ (where SQRT means square root)

Substituting and making appropriate sign changes:

$X = ((u) + (SQRT((u)^2 - 4(1)(-1)))) / (2(1)$

$X = ((u) + (SQRT((u)^2 + 4))) / 2$

To obtain the formula for the infinite scale tree zigzag pattern, the continuing fraction formula for the repeated moves of 2 elements is algebraically transformed to the generalized form of the quadratic formula, which is then solved as follows:

$X_2 = t + 1/(u + 1/X_1)$

$X_2 = t + 1/(uX_1/X_1 + 1/X_1)$

$X_2 = t + 1/((uX_1+1)/X_1)$

$X_2 = t + X_1/(uX_1+1)$

$X_2 = (t(uX_1+1) + X_1)/(uX_1+1)$

$X_2 = ((tuX_1+t) + X_1)/(uX_1+1)$

$X_2 = (tuX_1+t+X_1)/(uX_1+1)$

Set: $X_1 = X_2 = X$ Then:

$X = (tuX+t+X)/(uX+1)$

$X(uX+1) = (tuX+X+t)$

$X(uX+1) - (tuX+X + t) = 0$

$(uX^2+X) + (-tuX-X - t) = 0$

$uX^2 + X - tuX-X - t = 0$

$uX^2 - tuX - t = 0$

THIS IS NOW IN THE GENERAL FORM OF THE QUADRATIC EQUATION:
$aX^2 + bX + c = 0$

Where: $a = u$; $b = -(tu)$; $c = -t$

THE CLASSIC FORMULA FOR THE POSITIVE ROOT IS:

$X = ((-b) + SQRT(b^2-4ac)) / (2a)$ (where SQRT means square root)

Substituting and making appropriate sign changes:

$X = ((tu) + (SQRT((tu)^2 + 4(u)(t)))) / (2(u))$

$X = ((tu) + (SQRT((tu)^2 + 4(tu)))) / (2(u))$

$\boxed{1215/1024}$ Breakdown, (1.18652343750…)

18 Jan 98 · EW

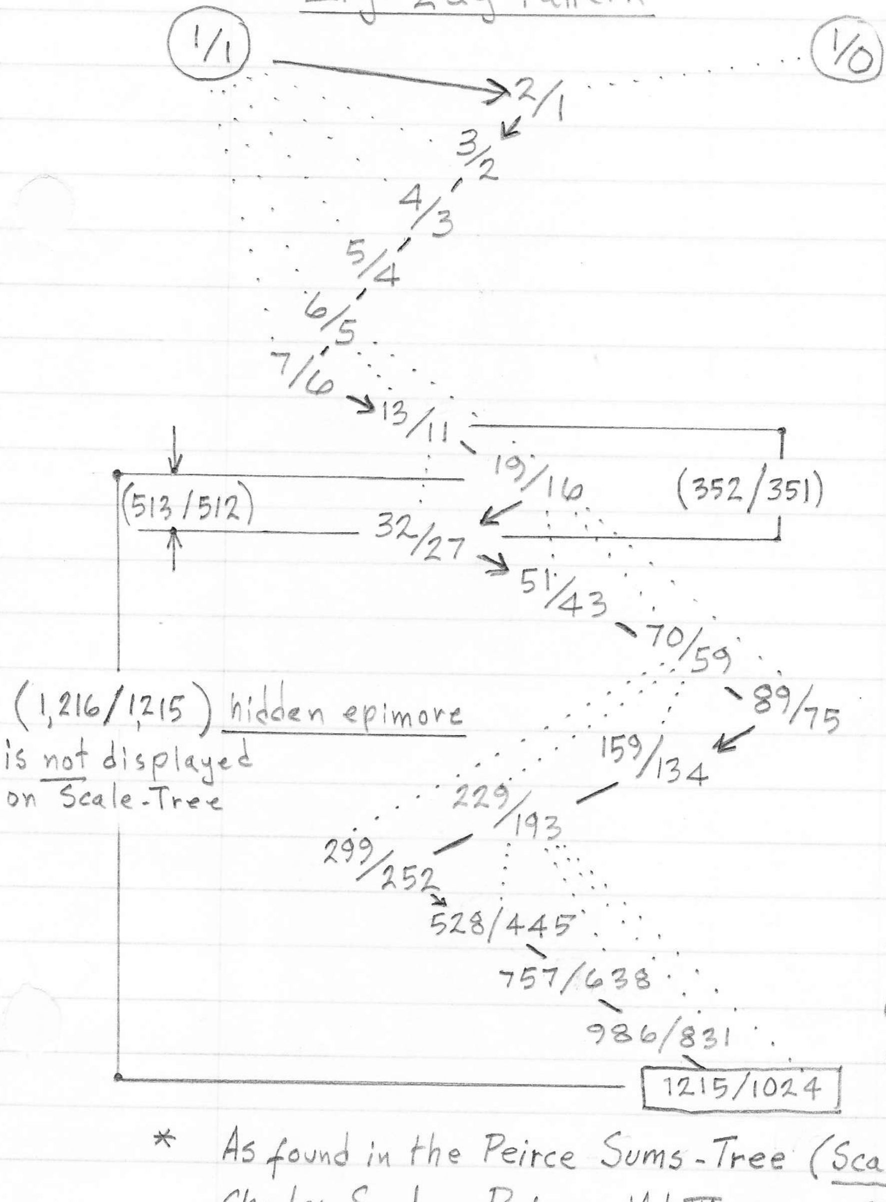
1/N Pattern

→	1	.186523…
←	5	.361
→	2	.768
←	1	.302
→	3	.312
←	3	.200
	5	.000

Example of hidden epimores

$$\frac{1215}{\cancel{1024}\ 64} \text{ e } \frac{19}{\cancel{16}\ 1} = \frac{1216}{1215}$$

* Zig-Zag Pattern



Epimoria

2/1	1/0
4/3	3/2
9/8	4/3
16/15	5/4
25/24	6/5
36/35	7/6
78/77	66/65
209/208	96/95
513/512	352/351
1377/1376	817/816
3010/3009	1121/1120
5251/5250	1425/1424
11926/11925	9381/9380
30687/30686	13511/13510
57708/57707	17641/17640
133056/133055	101905/101904
336865/336864	146102/146101
629068/629067	190299/190298
1009665/1009664	234496/234495

* As found in the Peirce Sums-Tree (Scale-Tree). Ref Collected Papers of Charles Sanders Peirce Vol IV pages 277-280, 578-580, Harvard U. Press 1933

$\boxed{1215/1024}$ Breakdown, (1.18652343750…)

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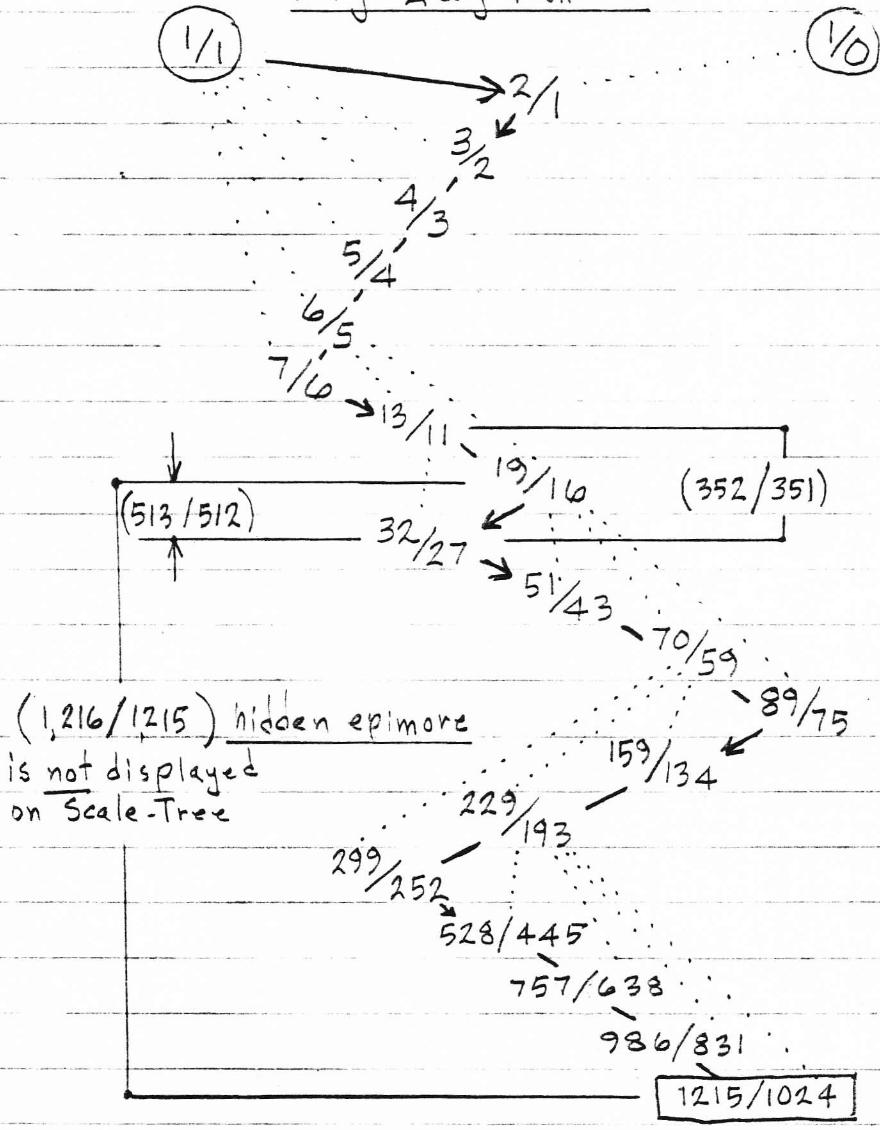

Epimoria

2/1	1/0
4/3	3/2
9/8	4/3
16/15	5/4
25/24	6/5
36/35	7/6
78/77	66/65
209/208	96/95
513/512	352/351
1377/1376	817/816
3010/3009	1121/1120
5251/5250	1425/1424
11926/11925	9381/9380
30687/30686	13511/13510
57708/57707	17641/17640
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$\frac{1215}{1024}$ Breakdown (1.18652343750...)

18 Jan 98 · EW

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→	1	.186523...
←	5	.361
→	2	.768
←	1	.302
→	3	.312
←	3	.200
	5	.000
	∞	.000

Zig-Zag Pattern

1/1

2/1

3/2

4/3

5/4

6/5

7/6

13/11

19/16

32/27

51/43

70/59

89/75

159/134

229/193

299/252

528/445

757/638

986/831

1215/1024

Epimoria (there a lot more to it.)

1/0

2/1

4/3

9/8

16/15

25/24

36/35

78/77

209/208

513/512

1377/1376

3010/3009

5251/5250

11926/11925

30687/30686

57708/57707

133056/133055

336865/336864

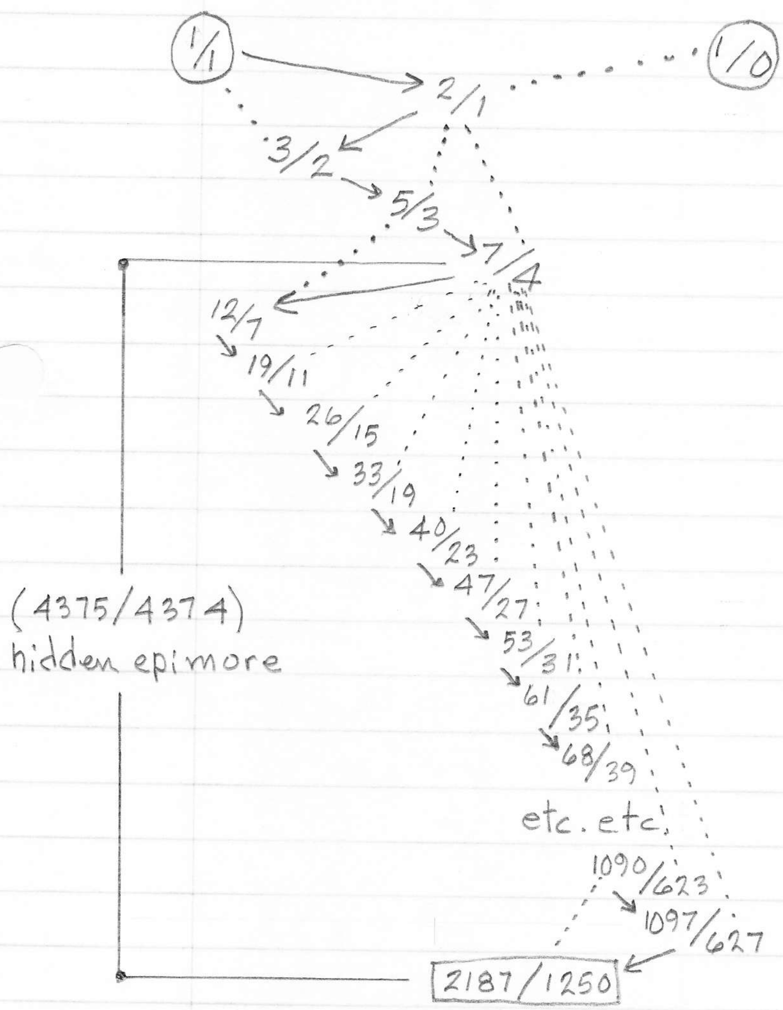
629068/629067

1009665/1009664

$\boxed{2187/1250}$ (1.749600000) Breakdown

1/n Pattern

→	1	.7496
←	1	.334
→	2	.993
←	1	.006
→{→	155	.499
←	2	.000



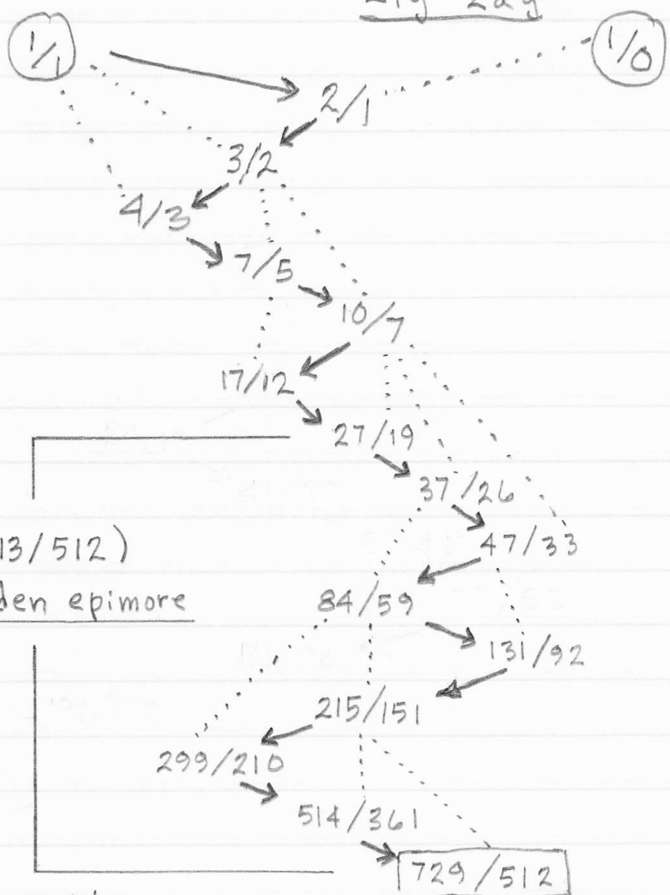
↘	⋰
2/1	1/0
4/3	3/2
10/9	6/5
21/20	8/7
49/48	36/35
133/132	77/76
286/285	105/104
495/494	133/132

$\boxed{729/512}$ (1.423828125) Breakdown

19 Jan 98 · EW

1/x	
→ 1	.423:
← 2	.359
→ 2	.782
← 1	.278
→ 3	.588
← 1	.700
→ 1	.428
← 2	.333
3	.000

Zig-Zag



(513/512)

hidden epimore

Epimoria →	Epimoria ·······
2/1	1/0
4/3	3/2
9/8	4/3
21/20	15/14
50/49	21/20
120/119	85/84
324/323	324/323
703/702	260/259
1222/1221	330/329
2773/2772	2184/2183
7729/7728	4324/4323
19781/19780	12685/12684
45150/45149	17641/17640
107940/107939	77615/77614
263169/263168	110080/110079

→ example:

$$\frac{\cancel{27}^{\,1}}{19}\ \mathrm{e}\ \frac{\cancel{729}^{\,27}}{512} = \frac{513}{512}$$

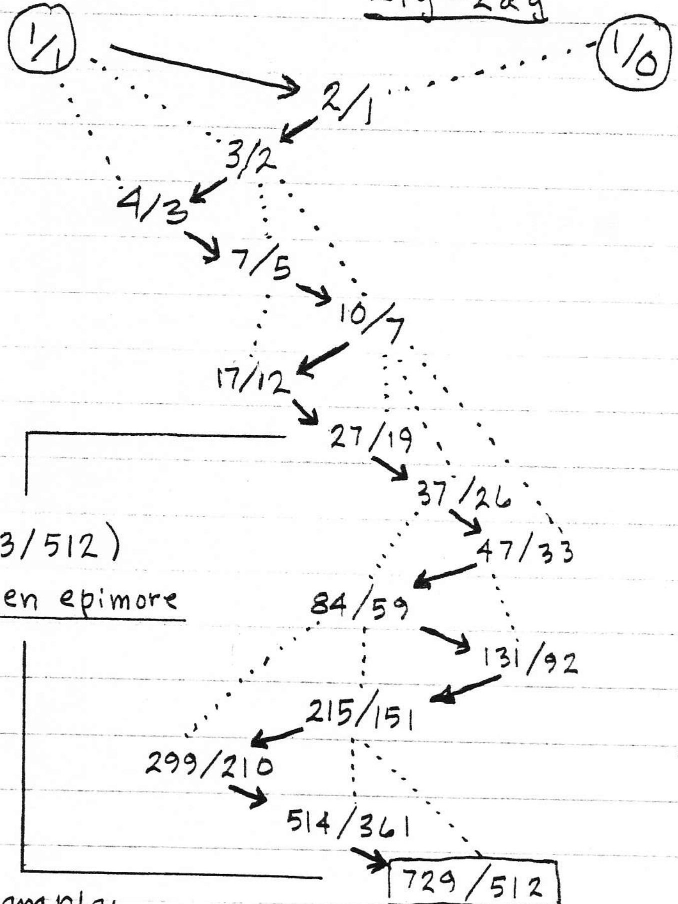
$\boxed{729/512}$ (1.423828125) Breakdown

19 Jan 98 · EW

1/x

→	1	.423
←	2	.359
→	2	.782
←	1	.278
→	3	.588
←	1	.700
→	1	.428
←	2	.333
	3	.000

Zig-Zag



Epimoria →	Epimoria ⋯
2/1	1/0
4/3	3/2
9/8	4/3
21/20	15/14
50/49	21/20
120/119	85/84
324/323	324/323
703/702	260/259
1222/1221	330/329
2773/2772	2184/2183
7729/7728	4324/4323
19781/19780	12685/12684
45150/45149	17641/17640
107940/107939	77615/77614
263169/263168	110080/110079

(513/512)

hidden epimore

example:

$$\frac{\overset{1}{\cancel{27}}}{19}\ e\ \frac{\overset{27}{\cancel{729}}}{512} = \frac{513}{512}$$

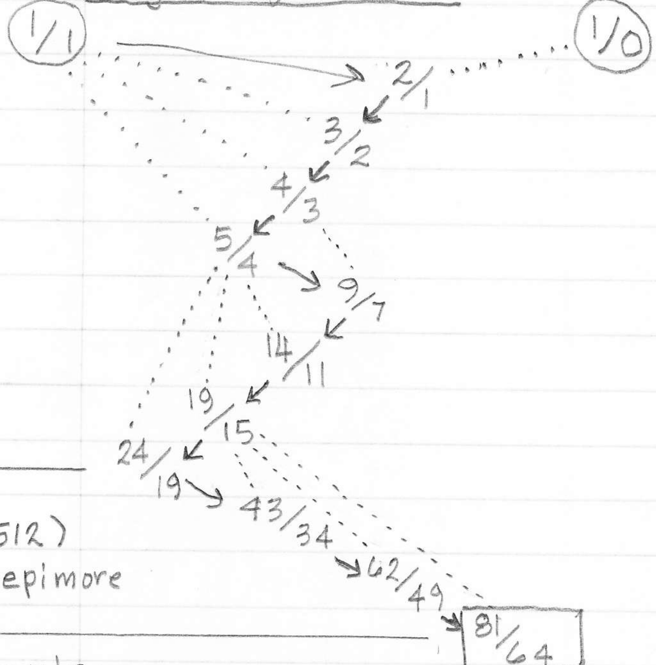
$\boxed{81/64}$ (1.265625) Breakdown

19 JAN 98 · EW

1/∝ Pattern

→	1.	.265625
←	3.	.764
→	1	.307
←	3	.250
→	4	.000
	∝	

Zig-Zag Pattern



(513/512)
hidden epimore

Epimoria

2/1	1/0
4/3	3/2
9/8	4/3
16/15	5/4
36/35	28/27
99/98	56/55
210/209	76/75
361/360	96/95
817/816	646/645
2108/2107	931/930
3969/3968	1216/1215

example:

$$\frac{\overset{8}{\cancel{24}}}{19} \; e \; \frac{\overset{27}{\cancel{81}}}{64} = \frac{513}{512}$$

other examples of hidden epimoria;

$$\frac{\overset{9}{\cancel{81}}}{64} \; e \; \frac{\overset{1}{\cancel{9}}}{7} = \frac{64}{63}, \quad \frac{5}{\underset{1}{\cancel{4}}} \; e \; \frac{81}{\underset{16}{\cancel{64}}} = \frac{81}{80}, \quad \frac{\overset{8}{\cancel{24}}}{19} \; e \; \frac{\overset{3}{\cancel{9}}}{7} = \frac{57}{56} \quad \text{etc.}$$

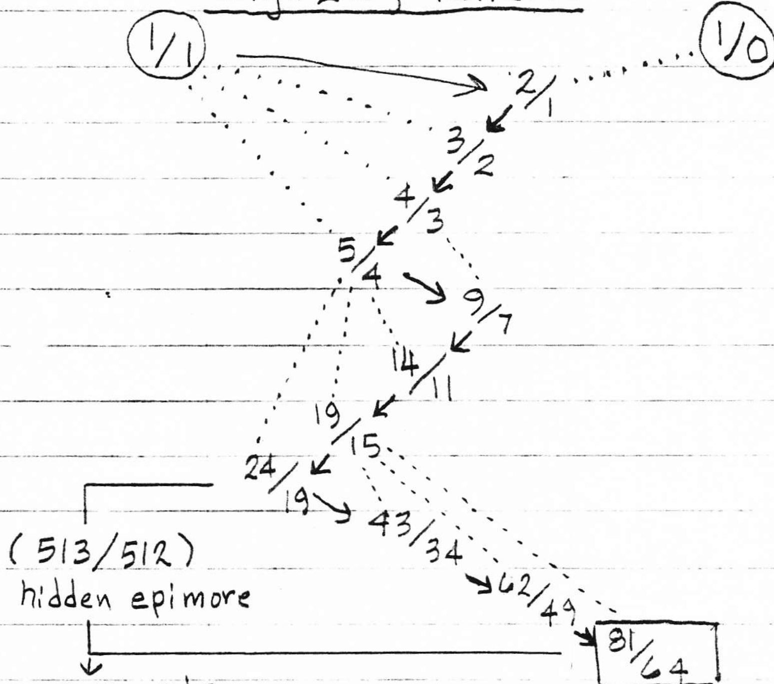
$\boxed{81/64}$ (1.265625) Breakdown

19 JAN 98 · EW

1/n Pattern

→	1.	.265625
←	3.	.764
→	1	.307
←	3	.250
→	4	.000
	∞	

Zig-Zag Pattern



Epimoria

2/1	1/0
4/3	3/2
9/8	4/3
16/15	5/4
36/35	28/27
99/98	56/55
210/209	76/75
361/360	96/95
817/816	646/645
2108/2107	931/930
3969/3968	1216/1215

example:

$$\frac{\overset{8}{\cancel{24}}}{19} \text{ e } \frac{\overset{27}{\cancel{81}}}{64} = \frac{513}{512}$$

other examples of hidden epimoria;

$$\frac{\overset{9}{\cancel{81}}}{64} \text{ e } \frac{\overset{1}{\cancel{9}}}{7} = \frac{64}{63}, \quad \frac{5}{\underset{1}{\cancel{4}}} \text{ e } \frac{81}{\underset{16}{\cancel{64}}} = \frac{81}{80}, \quad \frac{\overset{8}{\cancel{24}}}{19} \text{ e } \frac{\overset{3}{\cancel{9}}}{7} = \frac{57}{56} \quad \text{etc.}$$

1/2 Comma Meantone Fifth

.576002

18 Jul 2003 · sw

	.576002	
←	1	.736
→	1	.358
←	2	.789
→	1	.266
←	3	.748
→	1	.336
←	2	.975
	1	.024
	40	.660

0/1 . . . . . . 1/2 ← 1/1

1/2 → 2/3

2/3 → 3/5

3/5 — 4/7

4/7 — 7/12

7/12 — 11/19 — 15/26 — 19/33

19/33 — 34/59

34/59 — 53/92 — 72/125

72/125 — 125/217

125/217 — 197/342

40 pl.

epimoria

2/1

4/3

10/9

21/20

49/48

133/132

286/285

495/494

1,122/1,121

3,128/3,127

6,625/6,624

15,625/15,624

42,750/42,749

Golden section

	1.618034
→	1 .618
←	1 .618
→	1 .618
←	1 .618
←	1 .618
→	1 .618
←	1 .618
	etc

1/1 → 2/1 . . . . 1/0

2/1 → 3/2 → 5/3 → 8/5 → 13/8 → 21/13 → 34/21 → 55/34 → 89/55 → 144/89 → 233/144 → 377/233 → 610/377 → 987/610 → 1,597/987 → 2584/1,597

1/1

2/1

3/2

5/3

8/5

epimoria

2/1

4/3

10/9

25/24

65/64

169/168

442/441

1,156/1,155

3,026/3,025

7,921/7,920

20,737/20,736

54,289/54,288

142,130/142,129

372,100/372,099

974,170/974,169

2,550,409/2,550,408

7:10:13 Triad Within 13/7 Generic Octave

8ve. 13/7 $\log\left(\frac{13}{7}\right) = 1.0$ (generic 8ve)

generator 10/7 $\log\left(\frac{13}{7}\right) = .576175045288$

	$1/x$	.576···
←	1	.735
→	1	.359
←	2	.781
→	1	.278
←	3	.585
→	1	.708
←	1	.411
→	2	.428
←	2	.332
→	3	.007
	137	.36

0/1

1/1

1/2

2/3

3/5

4/7

7/12

11/19

15/26

19/33

34/59

53/92

87/151

121/210

208/361

295/512

503/873

711/1234

919/1595

1,630/2,829

etc

137 places

7:9:11 TRIAD IN 11/7 Generic 8ve, ET

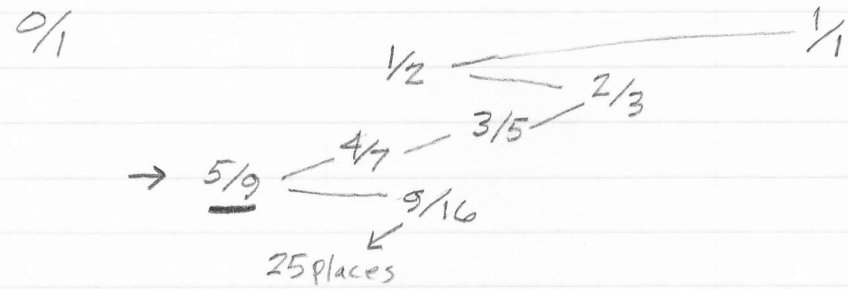
©1996 by Ervin M. Wilson

69 ET

8ve. $11/7 \quad \log\left(\frac{11}{7}\right) = 1.0$ (generic 8ve)

gen. $9/7 \quad \log\left(\frac{11}{7}\right) = .556023672187$ (generator)

$1/\alpha$	.556…
← 1	.798
→ 1	.252
← 3	.962
→ 1	.039
← 25	.595
1	.679
1	.471
2	.123
8	.120
8	.273



$\left(\frac{11}{7}\right)^{\left(\frac{1}{9}\right)} = \underline{1.05150300009}$, $\log_2 = .0724529662930$;
$1/\alpha = 13.8020574058$ steps/8ve

$\dfrac{\left(\frac{9}{7}\right)}{\left(\frac{11}{7}\right)^{\left(\frac{5}{9}\right)}} = 1.000211604$, $\log_2 = .000305248$, ($\times 1200 = .366$ cents) !

Reference Notes;

$1.05150300009^5 = 1.285442281$ (5 steps)

$9/7 = 1.285714286$

$1.05150300009^9 = 1.571428571$ (9 steps)

$11/7 = 1.571428571$

$1.05150300009^{14} = 2.019980727/1$ (1,217.20983372 cents)

This means that if the 14-tone equal scale is stretched by 17.21¢/8ve, some excellent 7:9:11 triads will occur in all keys, as will the $\overline{7:9:11}$ subharmonic triads.

Try the 7, 9, 11 Lambdoma;

	7	9	11
/7	7/7	9/7	11/7
/9	7/9	9/9	11/9
/11	7/11	9/11	11/11

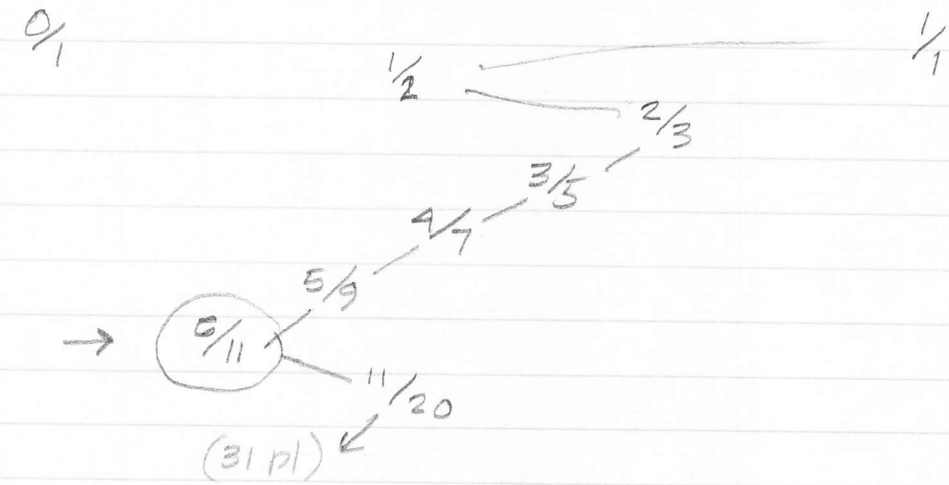
Generic 8ves (G8)

13/9 is G8, 11/9 is generator (gen)

8ve 13/9 $\log_2 = .530514716694 \div .530\cdots = 1$

gen 11/9 $\log_2 = .289506617192 \div .530\cdots = .545708927730$

	1/x	.545…
←	1	.832
→	1	.201
←	4	.969
→	1	.031
	31	.670
	1	.492
	2	.031
	31	.314
	3	.178

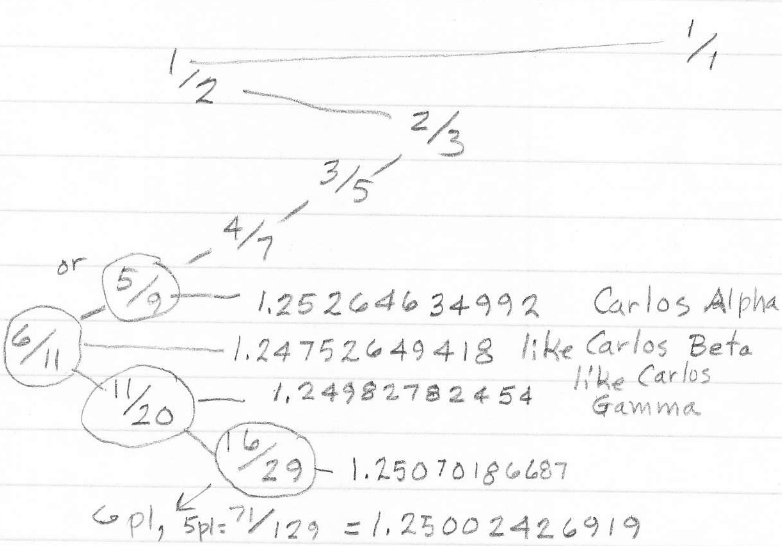


$\sqrt[11]{(13/9)} = 1.03399457087$

8ve 3/2, $\log_2 = .584962500721$, $\div .584\cdots = 1$

gen 5/4, $\log_2 = .321928094887$, $\div .584 = .550339713213$

	1/x	.550…
←	1	.817
→	1	.223
←	4	.466
→	2	.144
	6	.909
	1	.099
	10	.006
	143	.274



$\left(\frac{3}{2}\right)^{\left(\frac{1}{20}\right)} = 1.02048015365$

$\left(\frac{3}{2}\right)^{\left(\frac{11}{20}\right)} = 1.24982782454$

compare $5/4 = 1.25$, $\dfrac{(5/4)}{\left(\left(\frac{3}{2}\right)^{\left(\frac{11}{20}\right)}\right)} = 1.00013775134$

$\log_2 .000198719488470$

$\times 1200 = .238$ cent

Generic 8ves

8ve 5/3, $\log_2 = .736965594169$, $\div .736\cdots = 1.0$

gen 4/3, $\log_2 = .415037499275$, $\div .415\cdots = .563170794619$

$1/x$	.563…
← 1	.775
→ 1	.289
← 3	.475
→ 2	.185
5	.385
2	.591
1	.689
1	.450
2	.220
4	.537
1	.858

0/1

1/2 — 1/1

1/2 — 2/3

3/5 — 1.358655183

4/7 — 1.338969591

5/9 — 1.328156663

9/16 — 1.332876533

13/23 — 1.334728001

5 pl. 49/87 = 1.333365752 (at 4 pl)

$$\left(\frac{5}{3}\right)^{\left(\frac{1}{7}\right)} = 1.075703740,\ \log_2 = .105280799,\ 1/x = 9.498408142$$

$$\left(\frac{5}{3}\right)^{\left(\frac{1}{9}\right)} = 1.058400073,\ \log_2 = .081885066,\ 1/x = 12.212239040$$

$$\left(\frac{5}{3}\right)^{\left(\frac{1}{16}\right)} = 1.032441723,\ \log_2 = .046060350,\ 1/x = 21.710647179$$

$$\left(\frac{5}{3}\right)^{\left(\frac{1}{23}\right)} = 1.022458284,\ \log_2 = .032041982,\ 1/x = 31.209055328$$

$$\left(\frac{5}{3}\right)^{\left(\frac{1}{87}\right)} = 1.005888830,\ \log_2 = .008470869,\ 1/x = 118.051644102$$

$$\left(\frac{5}{3}\right)^{\left(\frac{1}{5}\right)} = 1.107566343,\ \log_2 = .147393119,\ 1/x = 6.784577244$$

13 16 19

		-4	-3	-2	-1				
		~~19~~	~~26~~	~~35~~	~~45~~				
		-3	-2	-1	0				
		~~13~~			~~32~~				
	-4	-3	-2	-1					
14.5	19	26	36	48	64	88	120	160	
	2.375	3.25	4.5	6	8	11	15	20	

$(2\times19)+26=64$

$(2\times26)+36=88$

$(2\times36)+48=120$

48 26 64 36 19

36 39 48 54 57

Most Auspicious Numbers

12 31 53 72 94

2
128
3
384

	n-2	n-1	n			
no	12	16	19	23		
	12	16	19	23	27.75	33.50

$\cancel{\frac{n-2}{4}+n-1=n}$

not completed
I've done it elsewhere
anyway

2
(
(
RCL 1
÷
4
)
+
RCL 2
)
=
STO 1,
(
(
RCL 2
÷
4
)

1	2	3	4	1_1	1_2	1_3	1_4
n-4	n-3	n-2	n-1	n			
96	128	171	228	304	406		

$$2\left(\left(\frac{n-4}{4}\right)+n-3\right)=n$$

541.5

* Save
3+16=19

$\frac{5}{4}$ $\frac{3}{2}$ $\frac{15}{8}$

$\sqrt[5]{2} = 1.14868935500$

	$1/x$	pattern
→	1	.148
←	6	.725
→	1	.379
←	2	.636
→	1	.570
←	1	.752
→	1	.329
	3	.038
	25	.811
	1	.232
	4	.305

$1/1$ $\quad$ $1/0$

$2/1$

$3/2$

$4/3$

$5/4$

$6/5$

$7/6$

$8/7$

$15/13$

$23/20$

$31/27$

$54/47$

$85/74$

$139/121$

$224/195$

$309/269$ ←

$394/343$ → 25 places

$\sqrt[3]{2} = 1.25992104989$

$1/x$	
1	.259
3	.847
1	.186
5	.549
1	.819
1	.220
4	.526
1	.899
1	.111
8	.937
1	.066

279

$\sqrt[2]{\left(\frac{3}{2}\right)}$

$\log_2$: .292481250

1/4 Pattern

←	3	.419
→	2	.386
←	2	.587
→	1	.702
←	1	.422
→	2	.364
←	2	.744
→	1	.342
←	2	.918
	1	.089
	11	.208

0/1

1/1

1/2

1/3

1/4

2/7

3/10 — 2 × 5

5/17

7/24 — 2 × 12

12/41

19/65

31/106 — 2 × 53

43/147

74/253

105/359

179/612 — 2 × 306

284/971

2 × 665 → 389/1330

673/2,301

11 places

$\frac{1081}{1848} = .584956709957$

$\log_2\left(\frac{3}{2}\right) = .584962500721$

1/x pattern

← 1.709
→ 1.409
← 2.442
→ 2.258
← 3.86111...
→ 1.161
← 6.200...
→ 4.999...
1.000...

$0/1$

$1/1$

$1/2$

$2/3$

$3/5$

$4/7$

$7/12$

$10/17$

$17/29$

$24/41$

$31/53$

$55/94$

$86/147$

$117/200$

$148/253$

$179/306$

$210/359$

$241/412$

$451/771$

$661/1130$

$871/1489$

$1081/1848$

← 1.709
→ 1.409
← 2.442
→ 2.260
← 3.845
→ 1.182
← 5.489
2.042
23.416

$$\frac{7133}{12288} = .580485026$$

7 10 7 10 7 10 7

7 17 7 17 7 = 55

17 7 17 7 17 = 65

$612 \times 4 = 2448$ 1/4 comma ~~meantone~~ 1/4 cma

$612 \times 8 = 4896$ 1/8 skhisma

9792 $17 \times 24 \times 24$

$8896 \times \phi = 3399.008409$!

$\frac{1133}{1632}$ —

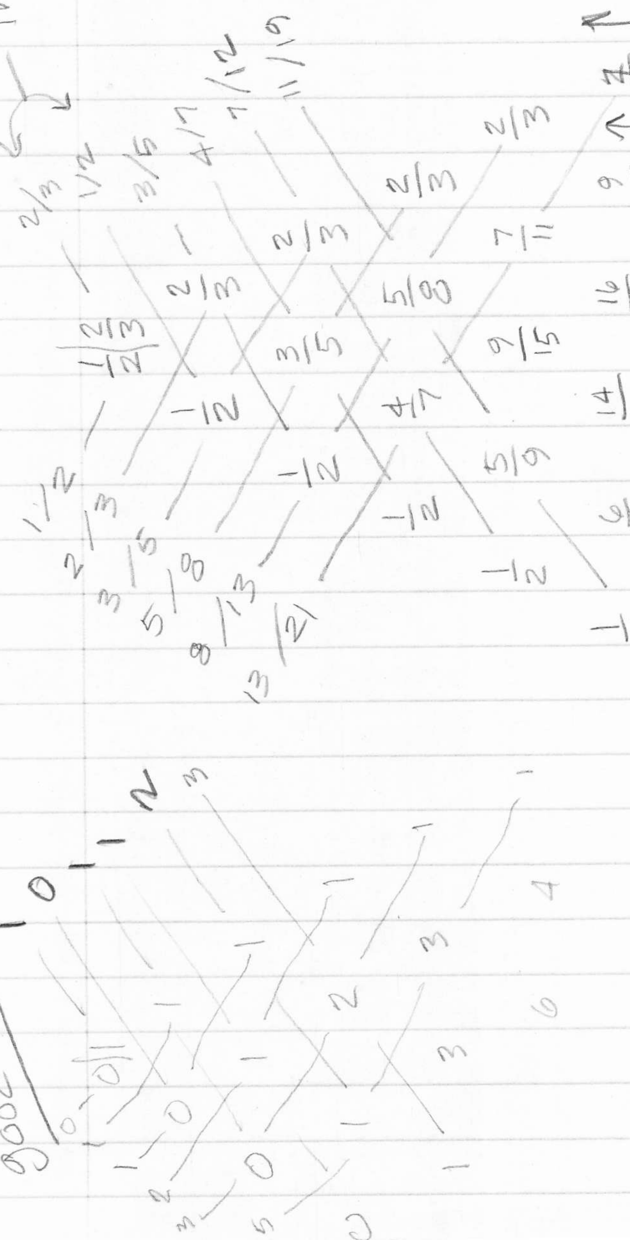
GOOD

The Yasserian flipflop

Aurelions

Aurelians

Good God!



$\phi, 1/2$	
←	1.440 $\frac{0}{1}$
→	2.270
←	3.696
→	1.436
←	2.289
→	3.448
←	2.228
	4.373
	2.676
	1.478

$\frac{1133}{1632}$, 1/2
1.440
2.270
3.696
1.436
2.292
3.416
2.40000
2.4999
2.000

12 × $2^5 \cdot 3^2 \cdot 17$

1/1

1/2

2/3

3/4

5/7

7/10

9/13

16/23

25/36

34/49

59/85

84/121

109/157

193/278

277/399

470/677

663/955

.0023 — 1133/1632 .00001717

856/1233 .0002795 .0000000226

1049/1511

— ϕ

Tuning 1 to $3 \cdot 5 \cdot 7 \cdot 9 \cdot 11 \cdot 13$ ⟶ .226516804129 14.

(+3) $\frac{7 \cdot 11}{3}$ (+59) $3^2 \cdot 5 \cdot 9 \cdot 13$

+1 $7/3$ +61 $3^2 5 \cdot 9 \cdot 11 \cdot 13$

−2 $5 \cdot 7/3$ +64 $3^2 9 \cdot 11 \cdot 13$

84	75	53	31	22	19	13
30.	27.	19.	11.	8.	3.	5.
69	X	43.	25.	18.	7.	11.
		26.	15.46	11	4.34	

.226516804129

← 4	.414
→ 2	.411
← 2	.430
2	.324
3	.085
11	.755
1	.318
3	.137
7	.290
~~3~~	~~.436~~

0/1 ← 1/1 ← 1/2 ← 1/3 ← 1/4 ← 1/5 → 2/9 → 3/13 → 5/22 → 7/31 → 12/53 → 17/75 — 29/128 — 41/181 — 53/234

−4 $7 \cdot 11/3^2$ +66 $3^3 5 \cdot 9 \cdot 13$

−5 $11/3$ +67 $3^2 5 \cdot 7 \cdot 9 \cdot 13$

−6 $7/3^2$ +68 $3^3 5 \cdot 9 \cdot 11 \cdot 13$

−7 -3 +69 $3^2 5 \cdot 7 \cdot 9 \cdot 11 \cdot 13$

−8 $5 \cdot 11/3$ +70 $3^2 7 \cdot 9 \cdot 13$

181,	53.	31,	22,	9,	13.
171.4	50.	29.	21.	8.	×
30.7	9.	5.	4,	1.52	~~2.2~~
73.6	21.55	12.6	9		
	33	19.5	14		
153.4	45	26	19		

$\frac{3^{2} 7 \cdot 9 \cdot 13}{3 \cdot 7 \cdot 11}$

$3 \cdot 9 \cdot 13$ 351

$3 \cdot 11 \cdot 13$ 429 11/9

315/429

$5 \cdot 7 \cdot 11$ 385

$5 \cdot 7 \cdot 9$ 315 (11/9)

Vigo Brondt $\frac{377}{\text{Fig 20}}$ 370 Mandelbaum

3 7 10 17 ~~27 44~~

8 19 27 46

If One has tuned by Fourths

13 3 16 19 35 $\underline{54}$ 89

!

27	36	48	64						
E	A	D	G	C	F	Bb	B♮	E♮	A♮
27	144			171			315		
	36	192			228			420	
		48	256			304			560

A Bb B♮ C D E♮ E F G A♮ A

$\sqrt[6]{3} = 1.200936933$

$\log_2 = .264160417$

<u>1/n Pattern</u>

←	3	.785
→	1	.272
←	3	.3663
→	1	.506
←	1	.973
→	1	.027
	36	.937

$0/1$

$1/1 \to 1/2 \to 1/3 \to 1/4 \to 2/7 \to 3/11 \to 4/15 \to 5/19 \to 9/34 \to 14/53 \to 23/87$

$14/53 \to (19/72)$

$7/72 = .097222$

16MAY01·EW

<u>1/n Pattern</u>

	.097222
← 10	.285
→ 3	.500
2	.006

0/1

<u>Zig-Zag</u>

1/1
1/2
1/3
1/4
1/5
1/6
1/7
1/8
1/9
1/10
1/11
2/21
3/31
4/41
7/72
103
113
173

$\sqrt[6]{\left(\frac{3}{2}\right)}$ .09749

1/x	
← 10	.257
→ 3	.890
← 1	.123
→ 8	.092
10	.754

0/1

1/1

1/2

1/3

1/4

1/5

1/6

1/7

1/8

1/9

1/10

1/11 → 2/21

3/31

4/41

7/72

→ 11/113

15/154

19/195

→ 23/236 2×118

27/277

31/318 6×53

→ 35/359 .0000007

39/400 .000006

8 pl

$\sqrt[6]{\left(\frac{4}{3}\right)} \approx .069172917$

<u>665</u> generator

SAVE
21 JUL 01 · EW

1/14		0/1
14	.456	
2	.190	
5	.250	
3	.993	
1	.007	
142	.479	

1/1
1/2
1/3
1/4
1/5
1/6
1/7
1/8
1/9
1/10
1/11
1/12
1/13
1/14
1/15
2/29
3/43
5/72
7/101
9/130 2×65
11/159 3×53
13/188 2×94
24/347
35/506
46/665 !

Hornbostle 678¢ Fifth

7 Aug 97
E. W.

$\log_2 = .565000\ldots$

1/14 Pattern

		.565…
←	1	.769
→	1	.298
←	3	.346
→	2	.888
←	1	.125
	8	.000

Zig-Zag Pattern

0/1
1/1
1/2
2/3
3/5
4/7
5/9
9/16
13/23 ←
22/39
35/62
48/85
61/108
74/131
87/154
100/177
113/200 ← exact
126/223
∞

Subharmonic 4-fold division of Φ 1.618

7 Aug 97
E.W.

$\frac{1}{\phi}$ $\frac{1}{1}$ $\frac{1}{1}$ $\frac{6}{5}$ $\frac{3}{2}$

$\frac{8}{12}$ $\frac{8}{11}$ $\frac{8}{10}$ $\frac{8}{9}$ $\frac{8}{8}$

$\frac{\phi}{12}$ $\frac{\phi}{11}$ $\frac{\phi}{10}$ $\frac{\phi}{9}$ $\frac{\phi}{\phi}$

						1			2
2					3	2		3	4
4			5		6	~~4~~	~~5~~	~~6~~	~~7~~	~~8~~
6		7		8	9	3	4	5	6
8	9	10	11		12				

1 ϕ
2 $2\cdot\phi$

1				1.618
1		1.309		1.618
1	1.206		1.412	1.618
1	1.154	1.309	1.463	1.618

an artificial Harmonic series where Φ is the 8ve.

$\frac{1}{1.618}$ $\frac{1}{1.463}$ $\frac{1}{1.309}$ $\frac{1}{1.154}$ $\frac{1}{1}$

$\frac{.618}{.618}$ $\frac{.683}{.618}$ $\frac{.763}{.618}$ $\frac{.886}{.618}$ $\frac{1}{.618}$

1.000000000 1.105572809 ~~1.105413644~~ 1.236067977 ~~1.235896026~~ 1.401491624 ~~1.401~~ 1.618033989

.000000000 .144794039 .305758086 .486963122 .694241914

Log 2

I	S	M	L
II	S	L	M
III	M	S	L
IV	M	L	S
V	L	S	M
VI	L	M	S

S	M	L
S	L	M
M	S	L
M	L	S
L	S	M
L	M	S

~~4193~~

$\sqrt{23} = 4.79583152331 5..$

1/N	
4	.795
1	.256
3	.897
1	.113
8	.795
1	.256
3	.897
1	.113
8	.795
1	.256
3	.897
1	.114
8	.741
1	.349
~~2~~	~~.864~~

Good Scale:

7 7 7 7

12 18 24 25 30 32 36 39 46 48

d g b d

6 6 6 6

7 7 7

9 16 23 30

all rationals

INDEX
EQUAL PHI
~~EQUAL PHI~~
~~SHORT LONG~~
EQUAL GOLDEN

The chances of hitting an interval are greater in the golden domain than in the rational, because of the very rapid way gold has of filling tone-space.

0	4/7	8/14	12/21	16/35
3/5	7/12	11/19	15/26	
6/10	10/17	14/24		
9/15	13/22			
12/20				

7/12 10/17 17/29 27/46 44/75

4/7	4/7	4/7	4/7	4/7	4/7
3/5	7/12	11/19	15/26	11/33	
3/5	10/17	21/36	26/62		
3/5	13/22	34/58			
3/5	16/27				
3/5					
3/5					

22
27

gen .584772087 $\left(\frac{32,805}{32,768}\right)$ Skhisma

.00628101

$3^8 \cdot 5 = \cancel{15}\ 5$ 8vs. plus 1 skhisma → 9 Major Thirds plus 8 minor thirds = ~~15~~ 5 Octaves (.001628101 shrink)

$3^8 \times 3/5 \quad \frac{3^9}{5} = \frac{19,683}{10,240} \quad \left(\frac{20,240}{19,683}\right)$ → 9 Minor Thirds plus 8 Major Thirds = 5 Octaves (.057265588 stretch)

g .591739766

$(6/5)^6 \times (4/3) \qquad \frac{\cancel{6}\ 3^{\cancel{6}5}}{5^6 \cdot \cancel{3}}$

6 minor thirds plus P4 = 2 Octaves (.006756066 stretch)

$\frac{6^{6}}{3 \cdot 5}$ ~~$= \frac{6}{5} \times \frac{6}{5} \times \frac{6}{5} \times \frac{6}{5} \times \frac{6}{5} \times \frac{6}{5} \times \frac{4}{3}$~~

$\cancel{6}\ 3^6/3 \cdot 5 = 3^5/5^6 = \frac{243}{15625}$ 15,552 $\left(\frac{15625}{15552}\right)$ Kleisma → 6 major thirds + 5 P4 = ~~2 Octaves~~. 4 8ves. (.006756066 shrink)

$3 \times 5^6/3^6 = 5^6/3^5$

$3^4/5 \quad \frac{81}{80}$ Comma

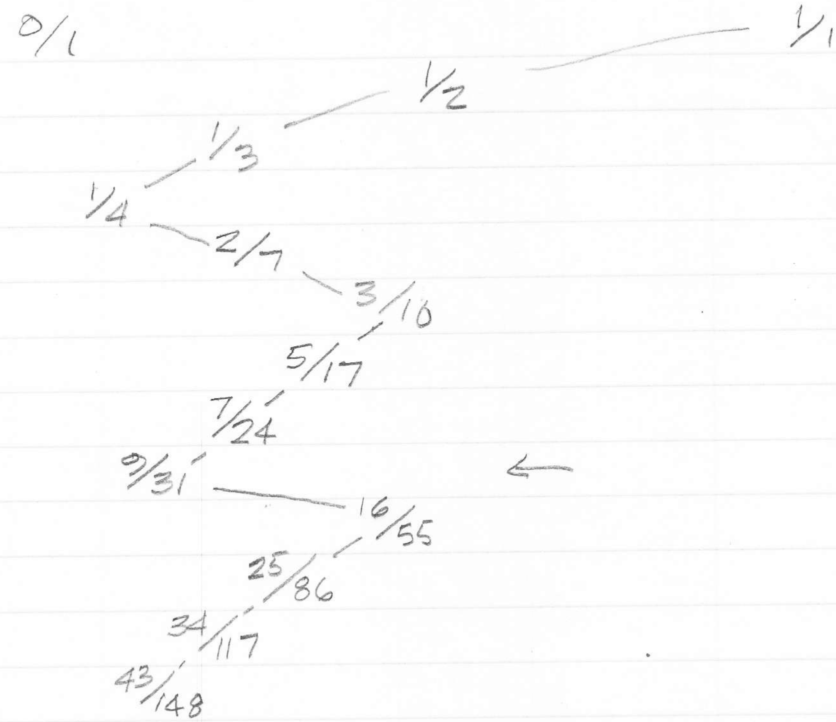
4 minor thirds plus 3 major thirds = Two Octaves (.017921908 shrink)

$3^3 \cdot 5 = 135/128$ L: Limma

4 major thirds plus + 3 minor thirds = Two Octaves (.076815597 shrink)

Z-Z pattern
Zandamela 3rd
Ave .29055

1/n	
3	.441
2	.263
3	.791
1	.263
3	.801
1	.247
4	.035
28	.0000



$\frac{\cancel{258}\ 86}{\cancel{441}\ 147}$ (.585034013605)

	1/n	
←	1	.709
→	1	.409
←	2	.446
→	2	.272
←	3	.666
→	1	.500
←	2	.000

0/1 1/1

1/2

2/3

3/5

4/7

7/12

10/17

17/29

24/41

31/53

55/94

86/147

117/200

3×147=441 !

86/441 (.195011337868)

	1/n	
←	5	.127
→	7	.818
←	1	.222
	4	.500
	2	.000

0/1 1/1

1/2

1/3

1/4

1/5

1/6 – 2/11 – 3/16 – 4/21 – 5/26 – 6/31 – 7/36 – 8/41

→

16/77 – 24/118 – 32/159 – 40/200 – 48/241

88/441

61/270

1/x pattern

.225925925926

←	4	.426
→	2	.346
←	2	.888
→	1	.125
	8	.000

Zig-Zag pattern

0/1

1/1

1/2

1/3

1/4

1/5

2/9

3/13

5/22

7/31

12/53

19/84

26/115

31/137

33/146

40/177

47/208

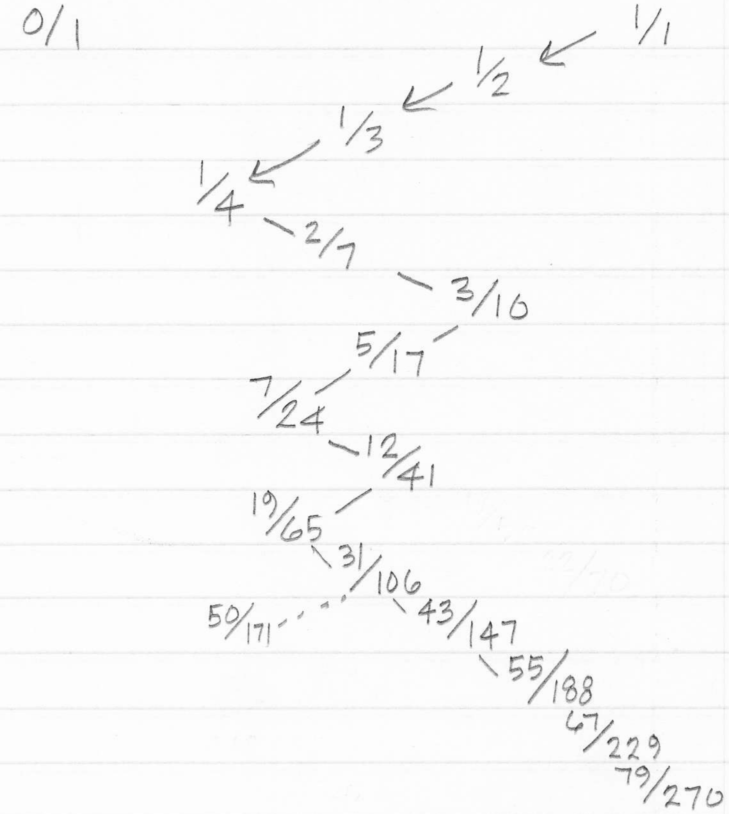
54/239

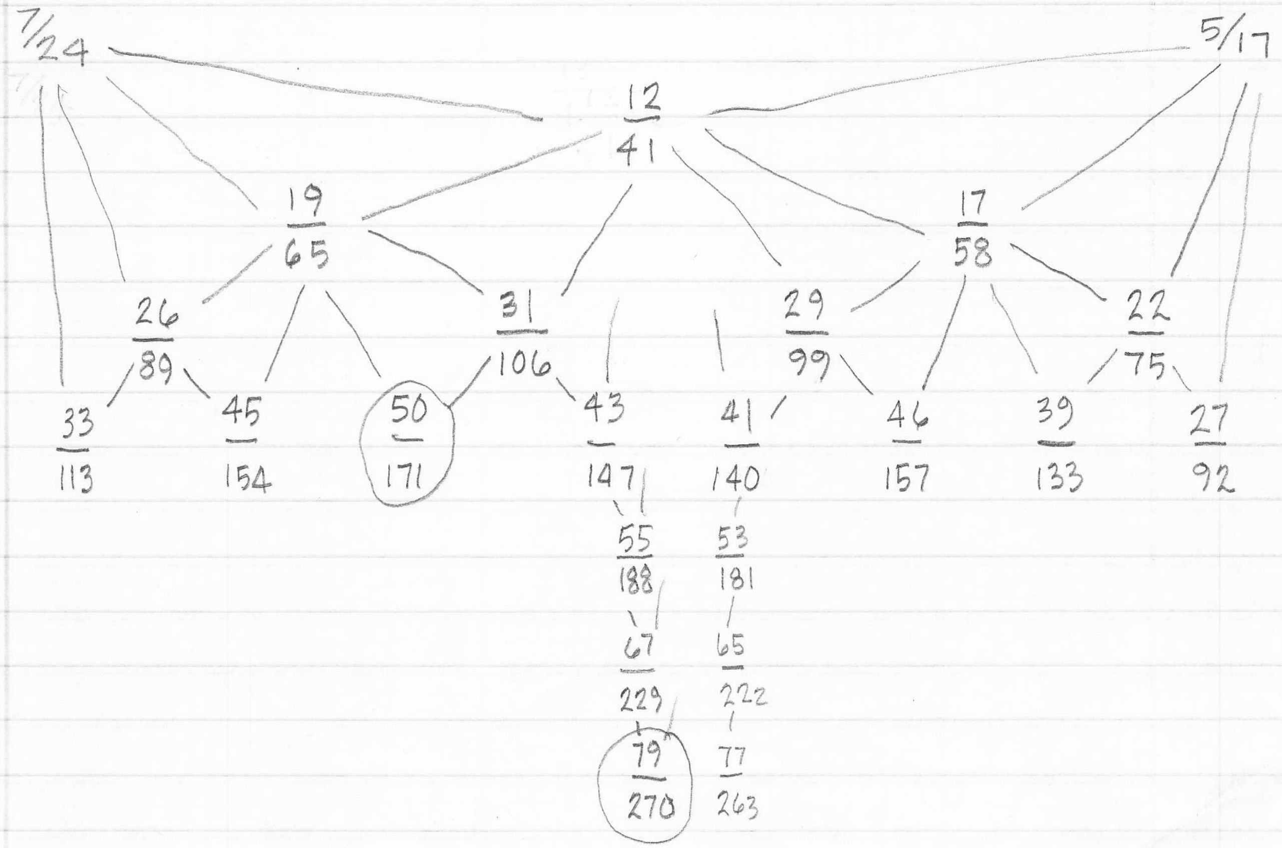
61/270

79/270 = .292592592593

1/4 pattern

←	3	.417
→	2	.393
←	2	.538
→	1	.857
←	1	.166
	6	.000





1/9 ~~comma~~ Skhisma

.415218399352

←	2	.408
→	2	.448
←	2	.228
→	4	.378
←	2	.643
→	1	.554
←	1	.802
→	1	.204
	4	.659
?	16	.691

0/1 1/1

1/2

1/3

2/5

3/7

5/12

7/17

12/29

17/41

22/53

27/65

49/118

71/171

120/289

191/460

311/749

502/1209

693/1669

884/2129

→ 1075/2589

1/9 Skhisma, 2-interval-patterns (2IP)

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.415218399352

←	2	.408
→	2	.448
←	2	.228
→	4	.378
←	2	.643
→	1	.554
←	1	.802
→	1	.246
	4	.059
?	16	.691

0/1
1/1
1/2
1/3
2/5
3/7
5/12
7/17
12/29
17/41
22/53
27/65
49/118
71/171
120/289
191/460
311/749

1/8 Skhisma 2-interval-patterns

.415241011860

2.408
2.449
2.224
4.454
2.200
4.981
1.019
52.127

1/x Zigzag Patterns

Seven Moves

		1/x
1, 6	.872983346206	1.145497224368
6, 1	.145497224368	6.872983346206
1, 1, 5	.541381265150	1.847127088380
1, 5, 1	.847127088380	1.180460421716
5, 1, 1	.180460421716	5.541381265150
2, 5	.458039891550	2.183215956620
5, 2	.183215956620	5.458039891550
1, 1, 1, 4	.645751311	1.548583770
1, 1, 4, 1	.548583770	1.822875656
1, 4, 1, 1	.822875656	1.215250437
4, 1, 1, 1	.215250437	4.645751311
1, 4, 2	.813274595	1.229596997
1, 2, 4	.688790992	1.451819219
2, 1 4	.355457658	2.813274595
2, 4, 1	.451819219	2.213274595
4, 2, 1	.229596997	4.355457658
4, 1, 2	.213274595	4.688790992
4, 3	.232050808 (-2.107)	4.309401077 (2.107)
3, 4	.309401077 (-1.692)	3.232050808 (1.692)
1, 1, 1, 1, 3	.609502311	1.640682869
1, 1, 1, 3, 1	.640682869	1.560834617
1, 1, 3, 1, 1	.560834617	1.783056839
1, 3, 1, 1, 1	.783056839	1.277046505
3, 1, 1, 1, 1	.277046505	3.609502311
1, 1, 3, 2		
1, 3, 2, 1		
3, 2, 1, 1		
2, 1, 1, 3		
1, 1, 2, 3	.589974874	1.694987437
1, 2, 3, 1	.694987437	1.438874930
2, 3, 1, 1	.438874930	2.278553482
3, 1, 1, 2	.278553482	3.589974874

cont.

$\sqrt[8]{6} = .323120312$

1/4 Pattern

3	.09
10	.54
1	.83
1	.20
4	.93
1	.07
13	.67

0/1

1/1

1/2

1/3

1/4

2/7 — 3/10 — 4/13 — 5/16 — 6/19 — 7/22 — 8/25 — 9/28 — 10/31 — 11/34

21/65

32/99

53/164

74/229

95/294

116/359

211/653

263

427

690

good 1/4, bad 11/8

.323119777 → 116/359

.32312404 2

Variations On The Dimished 7th Chord

July 13, 1994 ©1994 by Erv Wilson

5	12	17	29		7	17	24	41
3	7	10	17	OR ?	2	5	7	12
8	19	27	46		11	27	38	65

a golden sum sequence

.4198212717

1/x 2.3819660128

Therefore :	Log2
1	0
2.381966···	1.252152···
3.381966···	1.757862···
5.763932···	2.527053···
9.145898···	3.193124···
etc.	etc

TREE (Peirce)

3								5
7				8				12
10		11		19		13		17
17	14	26	19	27	21	31	18	29
	33	37	45	46	50	44	43	
	47	63	64		71	75	61	
	80		109		121		104	

Series (Peirce)

0	3	2	3	1	3	2	3	0
3	→ 14	11	19	8	21	13	18	5
7	33	26	45	19	50	31	43	12
10	47	37	64	27	71	44	61	17
17	80	63	109	46	121	75	104	29
27	127	100	173	73	192	119	165	46
44	207	163	282	119	313	194	269	75
71	334	263	455	192	505	313	434	121
115	541	426	737	311	818	507	703	196
186	875	689	1192	503	1323	820	1137	317
301	1416	1115	1929	814	2141	1327	1840	513
487	2291	1804	3121	1317	3464	2147	2977	830
788	3707	2919	5050	2131	5605	3474	4817	1343
1275	5998	4723	8171	3448	9069	5621	7794	2173

$2^{\left(\frac{7}{12}\right)} = 1.49830707688\ldots$

ACOUSTIC READ

1/n Pattern		
→	1	.498307...
←	2	.006
→	147	.173
←	5	.761
	1	.313
	3	.190
	5	.242
	4	.119

Zig-Zag Pattern

$1/1 \rightarrow 2/1$ $\qquad 1/0$

$4/3 \leftarrow 3/2 \leftarrow 2/1$

abridged

$4/3 \rightarrow \frac{442}{295} \rightarrow \frac{445}{297}$

$\frac{2655}{1772} \leftarrow \frac{2213}{1477} \leftarrow \frac{1771}{1182} \leftarrow \frac{1329}{887} \leftarrow \frac{887}{592} \leftarrow \frac{445}{297}$

15/37 .405405 405

1/7

0/1

1/1

1/2

1/3

2/5

3/7

5/12

7/17

9/22

11/27

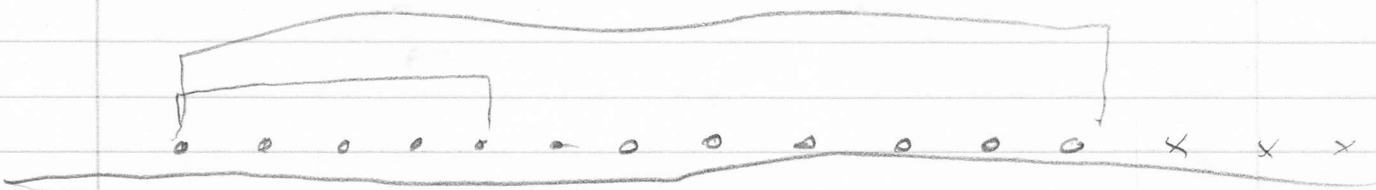
13/32

15/37

17/42

multi

2	.466
2	.142
7	.000
~~1,80~~	



Kyma ref Hobbs

Sample Rates is 48,000 ~~Kilo~~ Hertz

~~44,00~~

44,100 ~~KHz~~ Hz

44,100,~~000~~ Hz

highest frequency is 1/2 of ~~oscillator~~ sample rate

Mathew Alpert ? - Gods parts of the brain

"The mind of God seems to be music" (String theory etc)
Michio Kaku. "Wow!" student.

Hans Kaiserling - Susanne Doucet ? - scale of 7's Florida

20 19 18 17 16 15 14
21 20 19 18 17 16 15
10 9 8 7 6 5

10 commandments
K.G. June 12

In Evangelina

2 5 8 11 14 17 20 23 26
8 12 14 16 20 24 28

b c d# E F# G A B
23 12 14 15 17 18 20 23

5OCT01.EW

$\frac{13}{10}$ $\frac{30}{23}$

$\frac{300}{299}$

(!) 13 14 16 17 19 20 23 26 14Oct01.EW

13 15 17 19 (21) 23 26

Some one else's Star - Brian White - Keaf F

$\frac{7}{6}$ $\frac{4}{3}$ $\frac{17}{12}$ $\frac{5}{3}$ $\frac{23}{12}$ $\frac{1}{1}$

14 16 17 20 23 24 New Petrushka Chord 26NOV01.EW

(old Petrushka Chord use 11 instead of 23.)

C F A C
11 12 14 16 17 20 23 24
Cb Eb Gb A Cb

5 11 17 23 29 35 41 47 53 59 65 ~~67 73 79~~

71 77 83 89 95 101 107 113 119 125 131 137

143 149 155 161 167 173 179 185 191 197 203

5 – 35, 11 – 77 17 – 119 23 – 161 29 – 203

Pentadekang

5 11 17 23 29 35 Novarro Genus; 5-Fold 7/1

5 11

5 17

5 23

5 29

5 35

11 17

11 23

11 29

11 35

17 23

17 29

17 35

23 29

23 35

29 35

Novarro 4-fold 4/1 genus

4 7 10 13 16

15713

1, 7, 11, 15, 41

16 22 30 41 56

16 22 30 41 56

11	15	41	7	
11	15			330
11		41		225
11			7	308
	15	41		307.5
	15		7	420
		41	7	287

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34

C × C,# D, D × D,# E, E F × F,# F# G × G,# A, A × A,# B, B C

$\frac{27}{22}$ is −1.6¢ false in 34

3/2 is +3.9¢ in 34

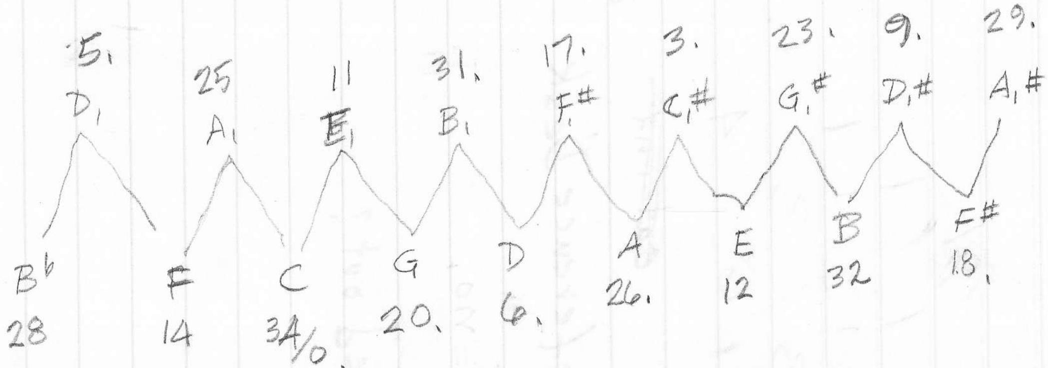
in 34

2.08 in 34

5/4 is 2.01

6/5 is

$$\begin{array}{r} 17 \\ +\ 5 \\ \hline 22 \end{array}$$



5/4 = 11

6/5 ~~10~~ 9

0/1 1/1

← 1.737
→ 1.355
← 2.810
→ 1.234
4.271
3.678

1/2
2/3
3/5
4/7
7/12
11/19
15/26
19/33
23/37

1/π
1.490

1.490
2.0399
25.052
19.144
6.935
1.068
14.534
1.869
1.1499
6.670
1.492
2.031
31.795
1.256
3.899
1.11
8.951
1.050

1/1 1/0
2/1
3/2
4/3
~~10~~ 76/51
7/5
10/7
13/9
16/11
19/13
22/15
25/17
25/17
28/19
31/21
34/23
37/25
40/27
43/29
46/31
49/33
etc

E is on 15 term of insideout meantone

.415 1/2

Meta-Mavila

←	2	.409
→	2	.442
←	2	.260
→	3	.845
	1	.182
	5	.489
	2	.042
	23	.415

0/1

1/1

1/2

1/3

2/5

3/7

5/12

7/17

12/29

17/41

22/53

39/94

(56/135)

61/147

/200

253

306

359

665

971

23 91

Pandji 710 & Wilajah Slendro

8 Aug 97
E.W.

$Log_2 = .591666666..$

1/4 pattern

		.591	0/1
←	1	.690	
→	1	.448	
←	2	.227	
→	4	.400	
←	2	.500	
	2	.000	

Zig-Zag Pattern

1/1
1/2
2/3
3/5
4/7
7/12
10/17
13/22
16/27
29/49
42/71
exact → 71/120
100/169
endless

Stretched 5 equal?

0	1.000000000
1	1.148698355
2	1.319507911
3	1.515716566
4	1.741101127
5.	2.000000000

The Fourth from 1.5157 to 2.0000 produces a difference tone below .5000 (.4843). Will a discete stretch put the difference tone in tune with the (stretched) scale?

1   2 $\overset{x}{\text{"3"}}$ $\overset{y}{\text{"4"}}$

$$\underline{x = \left(\sqrt[\cancel{10}\,5]{y}\right)^{\cancel{8}\,4}} \qquad \frac{y}{x} = \sqrt[5]{y} \quad \frac{x}{y} = \frac{1}{(\sqrt[5]{y})} \qquad y - x = 1$$

$$x = y/\sqrt[5]{y} \qquad \underline{y = x + 1}$$

4

3.031433133	4.031433133
3.050475692	4.050475692
3.061997446	4.061997446
3.068963454	4.068963454
3.073173159	4.073173159
3.075716472	4.075716472
3.077252773	4.077252773
3.078180690	4.078180690
3.078741112	4.078741112
3.079079571	4.079079571
3.079283975	4.079283975
3.079407417	4.079407417
3.079481964	4.079481964
3.079526984	4.079526984
3.079554172	4.079554172
3.079570591	4.079570591
3.079580506	4.079580506

cont

Stretch 5 Eq.

x	y
3.079580506	4.079580506
3.079586494	4.079586494
3.079590110	4.079590110
3.079592294	4.079592294
3.079593613	4.079593613
3.079594409	4. —
3.079594890	4. —
3.079595181	4 —
3.079595356	4. —
3.079595462	4. —
3.079595526	4. —
3.079595564	4. —
3.079595588	4 —
3.079595602	4 —
3.07959561	4. —
3.079595616	4. —
3.079595619	4. —
3.079595621	4. —
3.079595622	4. —
3.079595622	4.079595622
3.0795956 2334	4.0795956 2334

$\sqrt{x} = 2.019800887$

(0)		1.00000000
(1)	$\sqrt[10]{x}$ =	1.150963925
(2)	Pwr 2.	1.324717957
(3)	3.	1.524702580
(4)	4.	1.754877666
(5)(0)	5.	2.019800887
(1)	6.	2.324717957
(2)	7.	2.675666505
→ (3)	8.	3.079595623
(4)	9.	3.544503467
→ (5)	10	4.079595623

.014213078 8ve stretch,
(about 17¢)

Answer: yes! (this is well within the limits of Slendro 8ve stretches.)

$\sqrt[3]{z}$ $\sqrt[3]{z}^2$ x y z

1 "2" 3 "4" 5 "6" "7" "8"

$\sqrt[3]{z}^2 = \sqrt[1.5]{z}$ or $z^{\left(\frac{2}{3}\right)}$

$y = \sqrt[3]{z}^2 \times \left(\frac{z}{x}\right)^2$ $z - x = 1 \; 2$ $y = \frac{z+x}{2}$

8/7 7/6 8/7 7/6 8/7

11 22 33

10 21 32

$z - y = y - x$

$z = 2y - x$

another form

$z - x = 2$

$z - x = \sqrt[3]{z}$

$x = z - \sqrt[3]{z}$

$y = z^{\frac{2}{3}} \times \left(\frac{z}{x}\right)^2$

$\frac{x+z}{2} = y$

$\sqrt[3]{z} \rightarrow 2$

2.

$x + z = 2y$, $\underline{z = 2y - x}$

$x = z - \sqrt[3]{z}$	$y = z^{\left(\frac{2}{3}\right)} \times \left(\frac{z}{x}\right)^2$	$z = 2y - x$
6.000000000	7.111111111	8.222222222
6.203872573	7.155590679	8.107308784
6.098406073	7.132447108	8.166488142
6.152709277	7.144328897	8.135948516
6.132373102	7.139870527	8.147367952
6.135161934	7.140481321	8.145800707
6.133723722	7.140166307	8.146608891
6.134465365	7.140328744	8.146192124
6.134082911	7.140244977	8.146407042

1 $\quad$ $z^{(\frac{1}{3})}$ "2" $\quad$ 3 $\quad$ $z^{(\frac{2}{3})}$ "4" $\quad$ x "6" $\quad$ y "7" $\quad$ z "8"

Dec 25, 1990
© by Erv Wilson

Stretched 6-7-8 (+2=7)

$x = z - 2$	$y = z^{(\frac{2}{3})} \times \left(\frac{z}{x}\right)^2$	$z = 2y - x$
	7.1118	8.11715208
	7.111714303	
	7.111714293	
6.111714293	7.111714293	8.111714293

good

1 $\qquad \sqrt{x}$ 2 $\qquad x$ "4" $\qquad y$ "5" $\qquad z$ "6" $\qquad$ "8"

$$\frac{z}{x} = \sqrt[4]{y} \qquad z = 2y - x \qquad \frac{x+z}{2} = y$$

$$\frac{x}{z} = \frac{1}{\sqrt[4]{y}}$$

$$x = \frac{z}{\sqrt[4]{y}} \qquad y = \frac{x+z}{2}$$

4	5	6
~~4.012441830~~	~~5.006220915~~	~~6~~
~~4.011194746~~	~~5.005597373~~	~~6~~

1 2 3 4 5 6 7 8 "11" "14" 16 "8-11-14"

x y

+18 +10

1 2 4 8 16 32 64 128 256 512 1024 1408 1792 +4=5

5 8 8 "11" "14"

© Dec 31, 1990 E. Wilson "x" "y"

$$x = \frac{1024 + y}{2} \qquad y = \left(\sqrt[18]{x}\right)^{10} \times 32$$

1410.139258	1796.278515
1410.897111	1797.794221
1411.165465	1798.33093
1411.260473	1798.520947
1411.294108	1798.588217
1411.306016	1798.612031
1411.310231	1798.620462
1411.311723	1798.623446
1411.312251	1798.624503
1411.312438	1798.624877
1411.312505	1798.625009
1411.312528	1798.625056
1411.312536	1798.625073
1411.312539	1798.625079
1411.312540	1798.625081
1411.312541	1798.625081
1411.312541	1798.625082
1411.31254090	1798.62508179

$\sqrt[18]{x} = 1.4961635\,3823$, $\text{Log}_2 = .58126787\,7698$

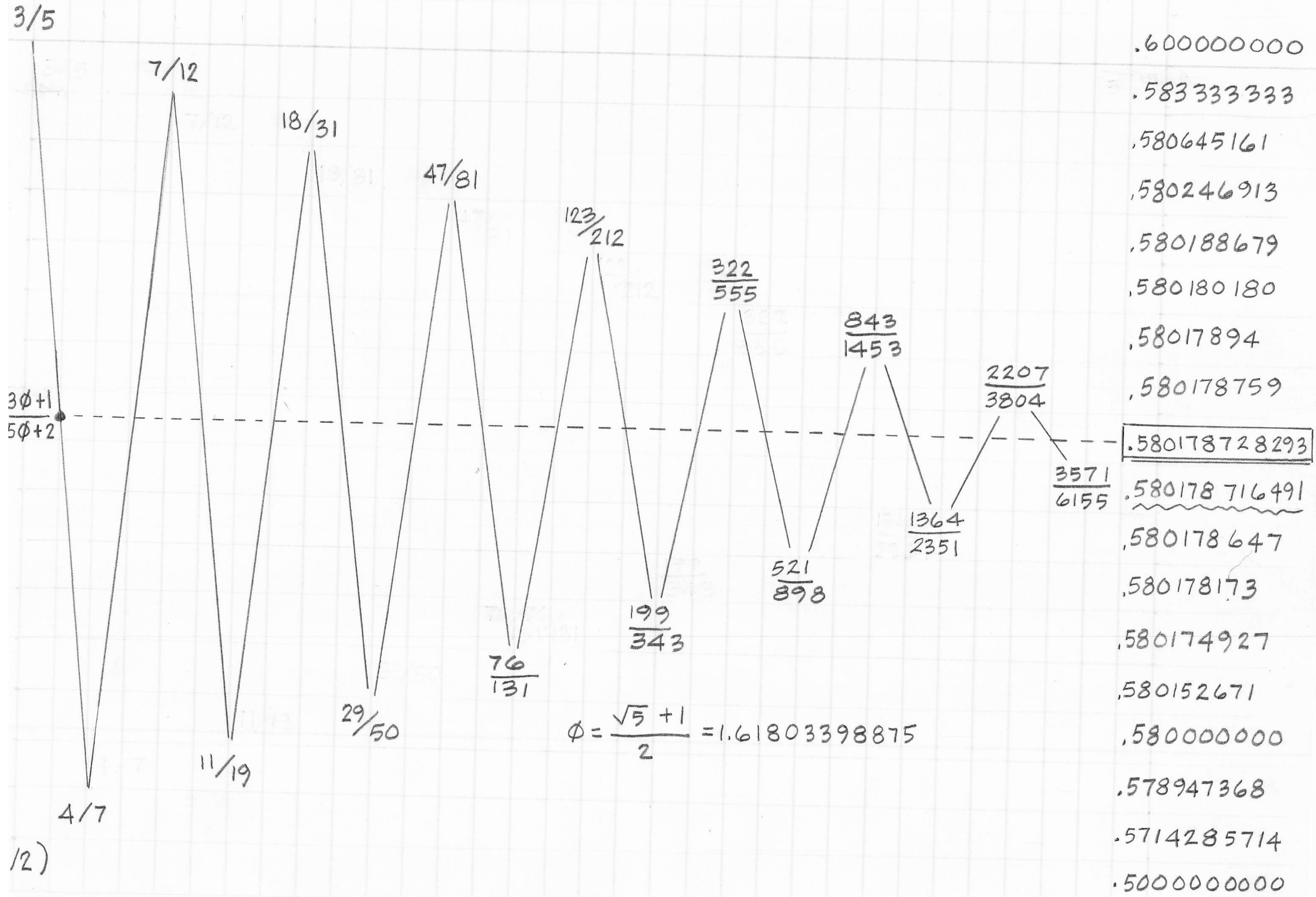
$1/x$ Zig-Zag Pattern 2, 2, 1, 1, 2, 1, 3, 1, 1, 10

Mos 1, 2, 3, 5, 7, 12, 19, 31, 43, 74, 117, 160, 203, 363

$\sqrt[4]{3}$ .396240625

Zig-Zag	V_κ	
2		.523
1		.909
1		.099
10		.040
24		.958
1		.043
22		.917
1		.090
11		.110
9		.071
13		.992
1		.607
132		.383
2		.606

1/1
1/2
1/3
2/5
3/8
5/13
7/18
9/23
11/28
13/33
15/38
17/43
19/48
21/53
23/58


3/5
7/12
18/31
47/81
123/212
322/555
843/1453
2207/3804
3571/6155
1364/2351
521/898
199/343
76/131
29/50
11/19
4/7
3ϕ+1 / 5ϕ+2
ϕ = (√5 + 1)/2 = 1.61803398875
.600000000
.583333333
.580645161
.580246913
.580188679
.580180180
.58017894
.580178759
.580178728293
.580178716491
.580178647
.580178173
.580174927
.580152671
.580000000
.578947368
.5714285714
.500000000
/2)

2-Interval Patterns from $\frac{8}{7}$ (1.142857714286)

Log_2 =
.192645077946

1/x routine

←	5	.190
→	5	.238
←	4	.192
→	5	.201
←	4	.967
→	1	.033
←	29	.775
	1	.289
?	3	.459

Zig-Zag Pattern

0/1

1/1 → 1/2 – 1/3 – 1/4 – 1/5 – 1/6 → 2/11 – 3/16 – 4/21 – 5/26 – 6/31 → 11/57 – 16/83 – 21/109 – 26/135 (×2 = 270) – 47/244 – 68/353 – 89/462 – 110/571 – 131/680 – 241/1251 – 351/1822 – 461/2393 – 571/2964 – 1032/5357 →

110/571 good 4/3

461/2393 .000000137

$(19 \cdot 13 \cdot 3 \cdot 2^2)$ * 571/2964 −.00000003722

1032/5357 .000000059

29 places

17,591/91,313 −2.7000000E−11

Stretched 26-tone Octave with cycle of Pure 8/7s.

$$\sqrt[130]{\left(\frac{8}{7}\right)^{26}} = 1.027066608709$$

$$\frac{8}{7}^{\left(\frac{1}{5}\right)}$$

1 2 4 7 8

$\underbrace{1 \qquad 2}_{26} \; \underbrace{2 \qquad 4}_{26} \; \underbrace{4 \qquad 7}_{21}$

$$\left(\log_2\left(\tfrac{5}{4}\right)+3\right)/8 = .415241012$$

$\boxed{\text{ITEM 1}}$

1/x Zig-Zag Pattern

←	2	.408
→	2	.449
←	2	.224
→	4	.454
←	2	.200
→	4	.981
←	1	.019
→	52	.129
	7	.702
	1	.424
	2	.357

0/1

1/1

1/2

1/3

2/5

3/7

5/12

7/17

12/29

17/41

22/53

27/65

49/118

71/171

120/289

169/407

218/525

267/643

→ Big Spur 485/1168

→ 52 Places

$\left(\log_2\left(\frac{5}{4}\right)+5\right)/9 = .591325344$

$\boxed{\text{ITEM 2}}$

1/x pattern

←	1	.691
→	1	.446
←	2	.237
→	4	.211
←	4	.736
→	1	.358
←	2	.792
→	1	.261
←	3	.823
→	1	.214
	4	.653
	1	.529

0/1

1/1

1/2

2/3

3/5

4/7

7/12

10/17

13/22

16/27

29/49

42/71

55/93

68/115

123/208

191/323

259/438

450/761

709/1199

968/1637

1227/2075

2195/3712

4 Pl

$(\log_2(\frac{5}{4})+2)/4 = .580482024$

$\boxed{\text{ITEM 3}}$

1/x Zig-Zag Pattern

←	1	.722
→	1	.383
←	2	.606
→	1	.649
←	1	.539
→	1	.852
←	1	.173
→	5	.765
←	1	.306
→	3	.267
	3	.741
	1	.347

0/1 1/1

1/2

2/3

3/5

4/7

7/12

11/19

18/31

29/50

47/81

65/112

83/143

101/174

119/205

220/379

339/584

458/789

577/994

$25/72 = .347222222\ldots$ (about 14/11)

	1/N	
		.347222…
←	2	.88
→	1	.136
←	7	.333
	3	.006

Zig-Zag

0/1 1/1

1/2

1/3

2/5

3/8

4/11

5/14

6/17

7/20

8/23

9/26 → 17/49

25/72

13 Jul. EW

$\frac{11}{8}$ MOS (.459431618638...)

1AUG98 - EW
sheet 2

<u>1/x Pattern</u>

		.459
←	2	.176
→	5	.662
←	1	.509
→	1	.962
←	1	.039
	25	.588
	1	.699
	1	.429
	2	.328
	~~3~~	.

<u>Zig-Zag Pattern</u>

0/1 1/2 ← 1/1

1/3 ← 1/2

1/3 → 2/5 - 3/7 - 4/9 - 5/11 - 6/13

11/24 ← 6/13

11/24 → 17/37 ⇦ !

28/61 ← 17/37

28/61 → (25 places)

Brocot

$191/23 = 8.304348$

17JUN00·EW

½ Pattern

←	8	.304
→	3	.285
←	3	.500
→	2	.000

$\frac{1}{1}$

Zig-Zag Pattern

← $\frac{1}{0}$

2/1 3/1 4/1 5/1 6/1 7/1 8/1 9/1 → 17/2

25/3

33/4

58/7 ←

83/10

108/13

191/23

$191/23 = 8.30434782609\ldots$

$\frac{a}{b}$	$\frac{c}{d}$	$\frac{e}{f}$	$\frac{c}{D}$ dec
$\frac{0}{1}$	$\frac{1}{1}$	$\frac{1}{0}$	1.000000 →
$\frac{1}{1}$	$\frac{2}{1}$	$\frac{1}{0}$	2.000000 →
$\frac{2}{1}$	$\frac{3}{1}$	$\frac{1}{0}$	3.000000 →
$\frac{3}{1}$	$\frac{4}{1}$	$\frac{1}{0}$	4.000006 →
$\frac{4}{1}$	$\frac{5}{1}$	$\frac{1}{0}$	5.000006 →
$\frac{5}{1}$	$\frac{6}{1}$	$\frac{1}{0}$	6.000000 →
$\frac{6}{1}$	$\frac{7}{1}$	$\frac{1}{0}$	7.00000 →
$\frac{7}{1}$	$\frac{8}{1}$	$\frac{1}{0}$	8.000000 →

cont.

$\frac{a}{b}$	$\frac{c}{d}$	$\frac{e}{f}$	$\frac{c}{d}$ dec
$\frac{8}{1}$	$\frac{9}{1}$	$\frac{1}{0}$	9.000000 ←
$\frac{8}{1}$	$\frac{17}{2}$	$\frac{9}{1}$	8.500006 ←
$\frac{8}{1}$	$\frac{25}{3}$	$\frac{17}{2}$	8.333333 ←
$\frac{8}{1}$	$\frac{33}{4}$	$\frac{25}{3}$	8.250000 →
$\frac{33}{4}$	$\frac{58}{7}$	$\frac{25}{3}$	8.285714 →
$\frac{58}{7}$	$\frac{83}{10}$	$\frac{25}{3}$	8.300000 →
$\frac{83}{10}$	$\frac{108}{13}$	$\frac{25}{3}$	8.307692 ←
$\frac{83}{10}$	$\frac{191}{23}$	$\frac{108}{13}$	8.304348 end

Noviembre 22, 1990

Recibí de Sr. Ervin Wilson
Cuatro Cientos Veinte dolares, y
Dos Cientos Treinta mil pesos
para pago de Javier Montes de
Trabajo del rancho Wilson.

Albino Montez G.
nabiembre 22 1990

---

on the other hand,

(3)

If we should choose a nine-tone scale, tho, thus;

0. 1.000 000 000 ✓
1. 1.080 059 739 ✓ 1/9 9 octave [illegible]
2. 1.166 529 040 ✓ 2/9
3. 1.259 921 050 ✓
4. 1.360 790 000 ✓ 4/9
5. 1.469 734 492 ~~This must be~~
6. 1.587 401 052 ✓ ~~wrong~~
7. 1.714 487 966 ✓
~~8. 1.009 673 533~~
8. 1.851 749 425 8/9
9. 2.000 000 000 9/9

Now the difference tone between #8 and #4 is 31.6 cents lower than the 8ve below #0. Let us stretch the 8ve to the $\sqrt[14]{3}$ (1.0816334) (22.7¢ stretch)

0. 1.000 000 000
4. 1.368 738 107
8. 1.873 444 005
9. 2.026 379 609

The difference tone ~~is now 16.2 ¢ less~~ between #8 and #4 is now 16.2 ¢ less than an 8ve below #0. (We've gone too far.)

←

Hanson

* NOTE 1

(4)

Zig-Zag Pattern for 1.366025403784

	$1/x$
1	.366 --
2	.732 --
1	.366 --
2	.732 --
etc	etc

(1/0)

$1/1 \rightarrow 2/1 \rightarrow 3/2 \rightarrow 4/3 \rightarrow 7/5 \rightarrow 11/8 \rightarrow 15/11 \rightarrow 26/19$

~~1 1/x + 1 = 2 1/x = 1.333~~

~~+2~~ , To calculate 1.366

0 + 1 = 1 1/x, 1

1 + 2 = 3 1/x, .333

?

.333 + 1 = 1.333 1/x, .75

.75 + 2 = 2.75 1/x, .3636

.3636 + 1 = 1.3636 1/x, .733

.733 + 2 = 2.733 1/x . 365

.365 + 1 = 1.365

---

0 + 2 = 2, 1/x, .5

.5 + 1 = 1.5, 1/x, .666

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Stretched 4-tone scale
with difference tone of Fourth in tune with Scale

1	"2"	"4"	"8"	"11" (x) 12	14 "15" (y)

$$\sqrt[13]{\frac{x}{4}} = \sqrt[17]{\frac{y}{4}}$$

$$y - x = 4$$

$$y = x + 4$$

$$\frac{y}{x} = \left(\sqrt[17]{\frac{y}{4}}\right)^4$$

$$x = \frac{y}{\left(\sqrt[17]{\frac{y}{4}}\right)^4}$$

x	y
10.99069304	→ 15
10.98547787	14.99069304
10.98255522	14.98547787
10.98091721	14.98255522
10.97999916	14.9809172[1]
10.97948461	14.97999916
10.97919621	14.97948461
10.97903456	14.97919621
10.97894396	14.97903456
10.97889318	14.97894396
10.97886472	14.97889318
10.97884877	14.97886472
10.97883982	14.97884877

← Cont.

Let us try the $\sqrt[23]{6}$ $\sqrt[32]{12}$
(1.080747934) (9.9c stretch)

#0	1.000000000
#4	1.364261602
#8	1.861209718
#9	2.011498557

The difference tone ~~15~~ between #8 and #4 now is 10.6c lower than the 8ve below #0. We're getting hot! The difference tone is in tune with the scale by .7c

But how about the $\sqrt[31]{11}$
(1.080421735) (5.2¢ str)

#0	1.000000000
#4	1.362615264
#8	1.856720359
#9	2.006041031

a ~~20.5¢ stretch~~ of the d.t. between ~~#8 and~~ #4.

1.080747934

Power		
	31	11.103
	32	12.000
	33	12.969
	34	14.016
	35	15.148

approximation to the Harrisonian "Harmonic Cloud" 11, 12, 13, 14, 15

←

(continued)

x	y
10.97883481	14.97883982
10.97883200	14.97883481
10.97883043	14.97883200
10.97882955	14.97883043
10.97882905	14.97882955
10.97882877	14.97882905
10.97882862	14.97882862
10.97882853	14.97882853
10.97882848	14.97882848
10.97882846	14.97882846
10.97882844	14.97882844
10.97882843	14.97882843
10.97882843	14.97882843
10.97882842	14.97882842
10.97882842	14.97882842
10.97882842	14.97882842
10.97882842	14.97882842

$\frac{x}{y} = 1.364337600$

$\sqrt[4]{\ } = 1.080762985$ * unit

Power 4 = 1.364337600 ←

" 8 = 1.861417087 ←

" 9 = 2.011750687 Stretched 8ve

31 = 11.10821618

32 = 12.00534888

33 = 12.97493668

34 = 14.0228313

35 = 15.15535701

$\left.\begin{matrix} 31 \\ \vdots \\ 35 \end{matrix}\right\}$ 11–15 Harmonic cloud

→

.008451525 8ve, stretched 8ve
(10.14c)

Dec 3, 1990

John,

This is the stretch required so that the difference tones produced by the +Fourths of a 9-tone equal scale will be in tone with the scale. Example: (#8 – #4) 1.861417087 – 1.364337600 = .497079487 which is .008451525 8ve lower than the 8ve below "1", (.500000000 / .497079487 = 1.0058753344 Log2 of which is .008451526 × 1200 = 10.14¢) Also the degree #9, 2.011750687 / 2.000000000 = 1.0058753344.

The 11–15 Harrisonian "Harmonic Cloud" is an ~~#~~ interesting correspondence.

yours,

Erv

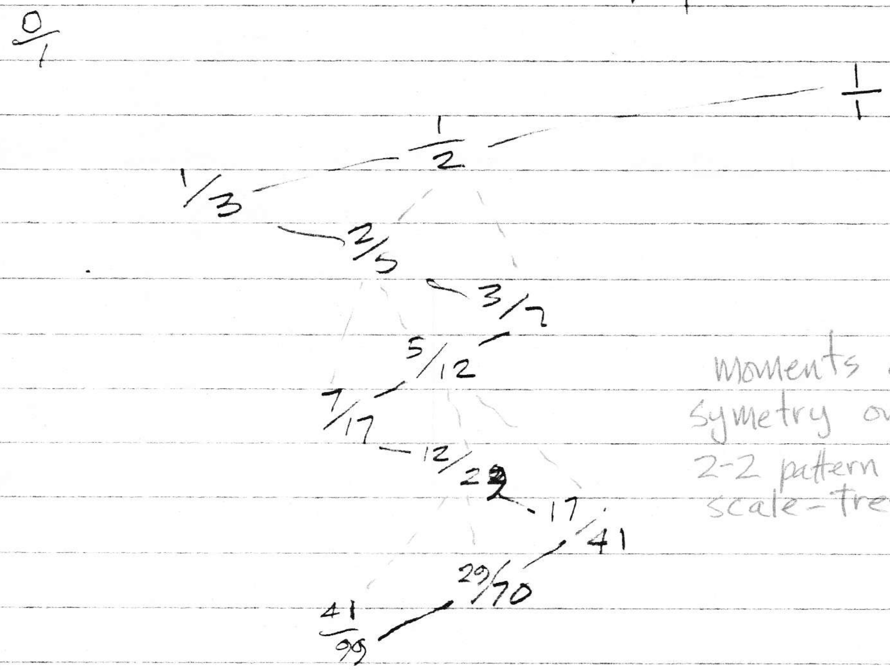
another topic, on the use of Hansons 1/x Z-Z pattern

Hansons Zig-Zag Pattern for

.41421356 2374

(subtract) 1/x

2	.414
2	.414
2	.414
2	.414



moments of
symetry on
Z-Z pattern thru
scale-tree

R11 × 18 = .455844123   11/8 = .459431618

× 14 = .798989873

× 21 = .69848481

× 8 = .313708499

SAVE * UPGRADED EXPRESSION

SIMPLE REPEATING ZIGZAG PATTERNS ON THE WILSON SCALE TREE

FIRST LEFT, THEN RIGHT FROM 1/1:

	1	2	1	2	3	1	3	1	3	2	2
	4,...	3,1,...	3,...	2,1,...	2,1,1,...	2,...	1,1,2,...	1,...	1,2,1,...	1,2,...	1,3,...
	<—	<—	<—	<—	<—	<—	<—	<—	<—	<—	<—
	<—	<—	<—	<—	<—	<—	—>	—>	—>	—>	—>
	<—	<—	<—	—>	—>	—>	<—	<—	—>	—>	—>
	<—	—>	—>	<—	<—	—>	<—	—>	<—	<—	—>
	—>	<—	—>	<—	—>	<—	—>	<—	—>	—>	<—
	—>	<—	—>	—>	—>	<—	<—	—>	<—	—>	—>
	—>	<—	<—	<—	<—	—>	—>	<—	<—	<—	—>
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	<—	<—	<—	—>	<—	<—	<—	<—	—>	—>	<—
	<—	<—	—>	<—	<—	<—	—>	—>	—>	<—	—>
	<—	<—	—>	<—	—>	—>	<—	<—	—>	—>	—>
*	<—	—>	—>	—>	<—	—>	<—	—>	<—	—>	—>
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	.	.	.	.	.	.	.	.	.	.	.
	.	.	.	.	.	.	.	.	.	.	.

GENERATING INTERVAL (AS FRACTION OF OCTAVE):

.236067977 .263762616 .302775638 .366025404 .387425887 .414213562 .581138830 .618033989 .720759220 .732050808 .791287847

*

EXACT FRACTIONS FOR THE ABOVE DECIMAL APPROXIMATIONS:

(√20-4)/2** (√21-3)/6 (√13-3)/2 (√12-2)/4** (√10-2)/3 (√8-2)/2** (√10-2)/2 (√5-1)/2 (√10-1)/3 (√12-2)/2** (√21-3)/2

(√5-2) (√3-1)/2 (√2-1) (√3-1)

* This last line of arrows corresponds to level 12 of the scale tree. Published tree charts extend only to level 11.

**To facilitate comparisons this fraction has not been reduced to its lowest terms. See expression just below.

1/20/91

Oct 12, 93

Larry,

This is the little chart that I am interested in referring to in Introduction to Scale-Tree. It shows a use of the scale-tree.

Yours,

Erv

Hansons formula gives these

SIMPLE REPEATING ZIGZAG PATTERNS ON THE WILSON SCALE TREE
1/X ANALYSIS SUGGESTED BY ERV WILSON

LARRY A. HANSON 21 Oct 1993

MOVES	GENERATOR	1/X
1,...	.618033989	1.618033989
2,...	.414213562	2.414213562
1,2,...	.732050808	1.366025404
2,1,...	.366025404	2.732050808
3,...	.302775638	3.302775638
1,3,...	.791287847	1.263762616
1,2,1,...	.720759220	1.387425887
1,1,2,...	.581138830	1.720759220
2,1,1,...	.387425887	2.581138830
3,1,...	.263762616	3.791287847
4,...	.236067977	4.236067977
1,4,...	.828427125	1.207106781
1,3,1,...	.780776406	1.280776406
1,2,1,1,...	.724744871	1.379795897
1,2,2...	.703257410	1.421954446
1,1,1,2,...	.632993162	1.579795897
1,1,2,1,...	.579795897	1.724744871
1,1,3,...	.561552813	1.780776406
2,3,...	.436491673	2.290994449
2,2,1...	.421954446	2.369924076
2,1,1,1,...	.379795897	2.632993162
2,1,2,...	.369924076	2.703257410
3,2,...	.290994449	3.436491673
3,1,1...	.280776406	3.561552813
4,1,...	.207106781	4.828427125
5,...	.192582404	5.192582404
1,5,...	.854101966	1.170820393
1,4,1,...	.807968253	1.237672391
1,3,1,1,...	.766402443	1.304797511
1,3,2,...	.765544457	1.306259867
1,2,...	.707828449	1.412771698
1,2,2,...	.704719196	1.419004911
1,2,1,1,1,...	.704159458	1.420132882
1,2,3,...	.703366976	1.421732943
1,1,1,2,1,...	.632782219	1.580322535
1,1,2,1,1,...	.618033989	1.618033989
1,1,1,1,2,...	.612451550	1.632782219
2,4,...	.449489743	2.224744871
2,3,1,...	.440394647	2.270690633
2,2,1,1,...	.419004911	2.386606875
2,1,1,2,...	.386606875	2.586606875
2,1,1,1,1,...	.382782219	2.612451550
2,1,2,1,...	.366025404	2.732050808
2,1,3,...	.360920843	2.770690633
3,2,1,...	.297537504	3.360920843
3,1,1,1,...	.274659470	3.640872096
3,1,2,...	.270690633	3.694254177
4,2,...	.224744871	4.449489743
4,1,1,...	.219803903	4.549509757
5,1,...	.170820393	5.854101966
6,...	.162277660	6.162277660