**WESTERN classical SCALE MODEL**

**Nicolas Copernic**
- Regular orbital
- Orbit divided by 12 = 7 + 5
  - heptatonic + pentatonic mode
  - with 12 transpositions for each

**Giordano Bruno**
- Infinity in musical scales is waiting since XVI century

Infinity in musical scales is waiting since XVI century
A scale gives a measurement to localize points in time. Musical points are notes, symbolizing audible vibrating: phenomena, events, etc., localized in space and time like human beings to link. Nowadays, in our scared society under control.

Equidistant points give a scale with a same interval:

A specific interval sounds unique, and sounds* the scale:

Frequency of Frequencies' sonorities* means: any scale sounds different.

There is an infinity of scales. Each one sounds different. Their function is to localize and link phenomenon.

*In French: « sonorité » is more appropriated; sound is a recorded, and archived object to deal of audible vibration. And « tone » refer to tonality which can have the same sound.
FIELD

The idea of electromagnetic field was introduced by James Maxwell in XIX century to understand "electricity, magnetism, and light as manifestations of the same phenomenon, electric and magnetic fields travel through universe as waves moving at the speed of light"

SCALAR FIELD

A function of a space whose value at each point is a scalar quantity. Used in physics to see the temperature or pressure distribution throughout space.

MUSIC SCALES FIELD

Nothing to see, nothing to quantify, values are many and various. We keep the idea of turbulent playground* of links influences. The field is an essential space for scales to interact, mutate and evolve. As Iannis Xenakis' "composition hors temps", but with time.

* as « espace d'influences de créations » in French
SCHEMATISATION D’UN CHAMP SCALAIRE simple
(avec 4 échelles, 2 modes et 2 gammes)

dans le cas d’un mode cyclique :
m1 donne g1 à 10 degrés

g1 se dis-pose et se trans-pose sur e2 et e4

g1
gamme monoscalaire

e1 à 4 correspondances
e2 à 3 correspondances
e3 à 5 correspondances
e4 à 4 correspondances

m1 mode monoscalaire

un mode n’est plus cyclique quand il emploie + de
la moitié de l’ambitus (range) de l’instrument.

e1

m2 (e2+e3+e4)
mode trascalaire à 13 degrés

e2

e3
e4

il n’y a gamme que si
le mode est cyclique

gamme trascalaire à 13 degrés

g2 se dis-pose et se trans-pose sur e1

dernière toute échelle, il existe un
ensemble d’échelles nonoctaviantes
multiples entre elles

correspondance d’échelles :

ETC.
where: $2 = 1 \iff \text{unison} = \text{fusion}$

process of assimilation/integration

In 1 God

Nonoctave Scalart Field actions, release from being digested = conditioned

with no Gods and out of any domination
There are more movements than 1

in NONOCTAVE state of mind: 8ve = ∞

Avoiding: 8ve 2 = 1, gives the opportunity to ear beyond what was masked by education.
The idea of nonoctaviation, started with the Russian-French composer Ivan Wyschnegradsky in the 30s of the XX century, he called: «espace non-octaviant».

With 6 + 3 scales dividing the 8ve from 24 to 72 <=>
1/4, 1/5, 1/6, 1/7, 1/8, 1/9, 1/10, 1/11, 1/12 of tone.

9 octavian microtonal scales;
where around the 8ve, are microtonal intervals which allow to play “modified octaves”;
is how he designed his «espace non-octaviant».

But, these 9 scales stay octavian
Like the Harry Partch’s 13 scales
**Nonoctave** scales are scales with any octave at all

How to build scales without octave?

**4 METHODS, and more**

1. starting with the range of a musical instrument:
   An interval X divided par Y steps with the formula:
   \[ y\sqrt{x} = x^{1/y} \] with \( x \neq 2; 4; 8; 16; 32; 64; 128 \)

2. continuing historically the tone division and extract its multiple nonoctave scales from:
   1/16; 1/15, 1/14; 1/13; 1/12; 1/11; 1/10; and 1/9 of tone. Above scales are included in these 8 ones.
   The extraction can go beyond 1/16 of tone. In these 53, 11 are microtonal, and 42 are macrotonal.

3. Each nonoctave scale extracted from a micro-tone got her cyclic range **from a tonal intervals** as:
   4\(^{th}\), 5\(^{th}\), 6\(^{th}\) major; 6\(^{th}\) minor; 7\(^{th}\) minor; 7\(^{th}\) major; 
   8\(^{ve}\)+2\(^{nd}\) minor; etc., to: double 8\(^{ve}\)+6\(^{th}\) minor, and beyond.

4. Using **intervals from the harmonic series**
   to build nonoctave scales.
   The result was unexpected: from 7/6 to 69/68 only one ratio 51/50 = 1,02 is strictly octavian: 35/2 = 1,02

In 1982 the music for flutes **Ourdission**
was composed with this principle
dividing the full range of the flutes
by the **prime number 41**.
To get the 3 noncyclic scales:
C flute = B3–C7 \(41\sqrt{8,4757} = 1,05351 = 90.244 \) cents
Piccolo = D4-C7 \(41\sqrt{7,55} = 1,0505 = 85.36 \) cents
Bass flute = C3-C6 \(41\sqrt{8} = 1,05202 = 87.76 \) cents


In 80s,
53 nonoctave scales was extracted
http://centrebombe.org/livre/10.1.html

In 80s/90s,
. 29 nonoctave scales was extracted from the 4\(^{th}\)
. 46 nonoctave scales was extracted from the 5\(^{th}\)
. 31 nonoctave scales was extracted from the 6\(^{th}\) minor
. 50 nonoctave scales was extracted from the 6\(^{th}\) major
. 77 nonoctave scales was extracted from the 7\(^{th}\) minor
. 84 nonoctave scales was extracted from the 6\(^{th}\) major
. 99 nonoctave scales was extracted from the 8\(^{ve}\)+2\(^{nd}\) minor

http://centrebombe.org/livre/10.1.3.html

In 80s,
63 nonoctave harmonic scales was extracted
http://centrebombe.org/livre/10.1.4.html
Extraction METHOD 2

http://centrebombe.org/livre/10.1.html

Les 8 premières échelles non-octavantes asymétriques et cycliques multiples de l'échelle 1/16 de ton (12,5 cents) 96√2=1,00725 :

1/16th

7 échelles non-octavantes asymétriques et cycliques multiples de l'échelle 1/15 de ton (13,33.. cents) 90√2=1,00773 :

1/15th

nonoctave scales
from octave micro-tone scales
From now, there are around 532 non-octave scales stored, and 257 published ready to be performed, in Scala file format. Scala is the scale calculator I was waiting for, 35 years ago. Thanks to Manuel Op de Coul since ~ 2000.

BUT

The point is not just to tune musical instrument. The point is since 80s to create the next harmony.

A turbulent harmony-synthesis in constant metamorphosis

1. We consider the range of intervals to build a scale from 11 cents to 239 cents. 11 cents give a 109.09.. pitches per 8ve, 239 give 5,0209205.. pitches per 8ve.

2. 3 types of scales: cyclic, quasicyclic, noncyclic works with range identification.

3. Differences between: scale, mode, gamma

4. Non-octave composed scales
   http://centrebombe.org/livre/10.0.3.html
The nonoctave Scalar Field harmony

Is the playground of a moving map where to compose connections, links, relationships, sympathies, and resonances between fixed scales (modes & gammas) and/or in metamorphosis: all playing together.

The benefit of the nonoctave harmony is to be released from inevitable attraction. The tonal harmony is included with its multitonalities principle, but its exclusion rules are not working anymore.

To go elsewhere, somewhere and not come back inevitably.

Without any false note A huge amount of unheard chords are waiting to be heard

A NEW START FOR A NEW MUSICAL ADVENTURE FOR THE NEXT 300 YEARS.

from stressed to calm