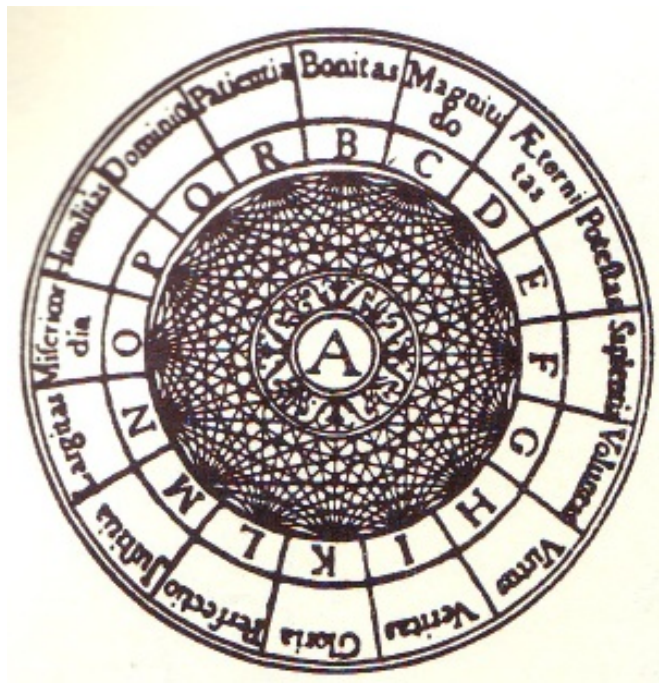


LULL: from 256 Odu of IFA to 256 Cellular Automata

Ramon Llull Connected Ancient Wisdom to 21st Century Science



Ramon Llull (ca 1232 to 1315) developed his 16-vertex A-wheel by studying Arabic language and culture.

The Arabic divination system Ilm al Raml is based on 16 elements.

Lull showed 120 lines connecting distinct pairs of the 16 vertices.

They were all the distinct pairs ($16 \times 16 - 16 = 256 - 16 = 240$) but considering that order does not matter (line from A to B is considered the same as line B to A) so that

the total number of distinct pairs (disregarding order) is $240/2 = 120$.

The 16 vertex elements and 120 line pairs correspond to the 16 vectors and 120 bivectors of the real Clifford Algebra $Cl(16)$.

$$Cl(16) = Cl(8) \times Cl(8)$$

each $Cl(8)$ is $16 \times 16 = 256$ -dimensional

and

since any very large Clifford Algebra $Cl(8N)$ can be factored into the tensor product

$$Cl(8N) = Cl(8) \dots (x) \dots (N \text{ times tensor product}) \dots (x) \dots Cl(8)$$

you can take the completion of the union of all the tensor products and get a generalized Hyperfinite II₁ von Neumann Algebra factor that represents a realistic Unified Physics Model including Gravity and the Standard Model,

so, effectively,

Llull's A-wheel is a Seed that grows into a realistic Unified Physics Model including Gravity and the Standard Model.

Where did Llull's A-wheel Seed come from?

Llull probably developed his A-wheel from the 16-element Arabic divination system *Ilm al Raml*.

Ilm al Raml came to Arabs from African IFA.

IFA has $2^8 = 16 \times 16 = 256$ Odu

based on 16 Orishas

- 0 Ogbe (light of creation) - Orunmila (wisdom Tao)
- 1 Osa (creativity) - Oya (wind)
- 2 Otura (unity of everything) - Osain (forest spirits)
- 3 Owonrin (rain) - Oshun (rivers) (He Xiangu)
- 4 Irete (fate) - Babalu Aye (healer) (TieGuai Li)
- 5 Ofun (taboo) - Eshu Legba (trickster)
- 6 Edi (womb) - Obatala (hermaphrodite father of humanity)
- 7 Okanran (lightning) - Chango (thunder)
- 8 Ogunda (sword) - Ogun (iron) (Lu Dongbin)
- 9 Iwori (consciousness) - Eshu Legba (messenger)
- 10 Ose (victim of abuse) - Osun (guardian angel)
- 11 Oturopon (trap) - Ochosi (hunter)
- 12 Irosun (fire) - Aganyu (volcano)

- 13 Ika (forest land) - Yemaya (ocean)
- 14 Obara (rainbow) - Inle (two intertwined snakes, medicine)
- 15 Oyeku (dark of earth) - Ibeyi (twins Yin-Yang)

Pairs of the 16 Orishas give $16 \times 16 = 256$ Odu

What are the structural relationships among the 256 Odu, corresponding to each of the two 256-dimensional $Cl(8)$ of Lull's $Cl(16) = Cl(8) \times Cl(8)$?

Since the graded structure of each $Cl(8)$ is $256 = 1 + 8 + 28 + 56 + 70 + 56 + 28 + 8 + 1$ we have

$$Cl(8) \times Cl(8) = (1 + 8 + 28 + 56 + 70 + 56 + 28 + 8 + 1) \times (1 + 8 + 28 + 56 + 70 + 56 + 28 + 8 + 1) =$$

$$= 1 + 16 + 120 + 560 + 1,820 + 4,368 + 8,008 + 11,440 + 12,870 + 11,440 + 8,008 + 4,368 + 1,820 + 560 + 120 + 16 + 1 =$$

$$65,536 = Cl(16)$$

and

$$\text{for vectors, } 1 \times 8 + 8 \times 1 = 8 + 8 = 16$$

$$\text{for bivectors, } 1 \times 28 + 8 \times 8 + 28 \times 1 = 28 + 64 + 28 = 120$$

$$\text{for spinors, } \sqrt{65,536} = \sqrt{256 \times 256} = \sqrt{256} \times \sqrt{256} = 16 \times 16$$

$$\text{for half-spinors, } Cl(16) \text{ has } 128 + 128 \text{ and } Cl(8) \text{ has } 8 + 8$$

so

$$\text{each } Cl(8) \text{ has } 8 \text{ +half-spinors and } 8 \text{ -half-spinors}$$

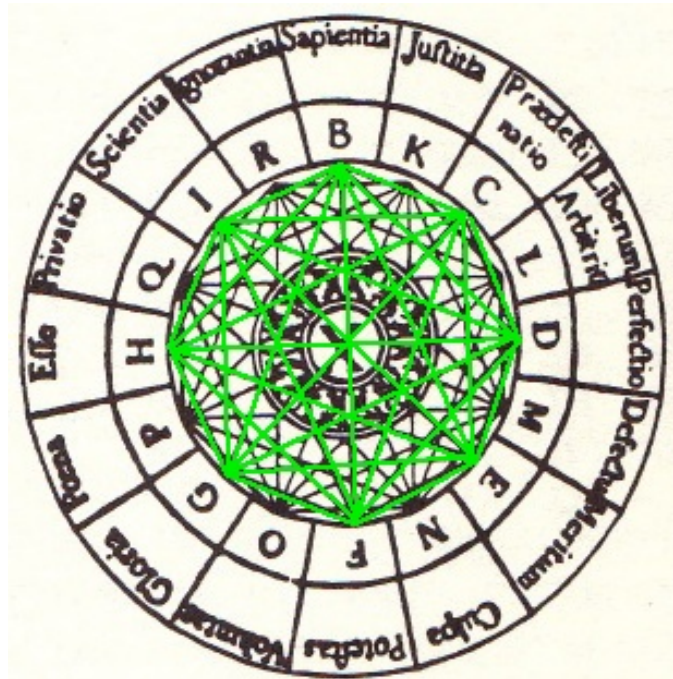
and

by Triality for $Cl(8)$

the 8 $Cl(8)$ vectors = the 8 $Cl(8)$ +half-spinors = the 8 $Cl(8)$ -half-spinors

Lull's X-wheel has 8 vertices (green) for vectors of one $Cl(8)$

and 8 vertices (black) for vectors of the other $Cl(8)$

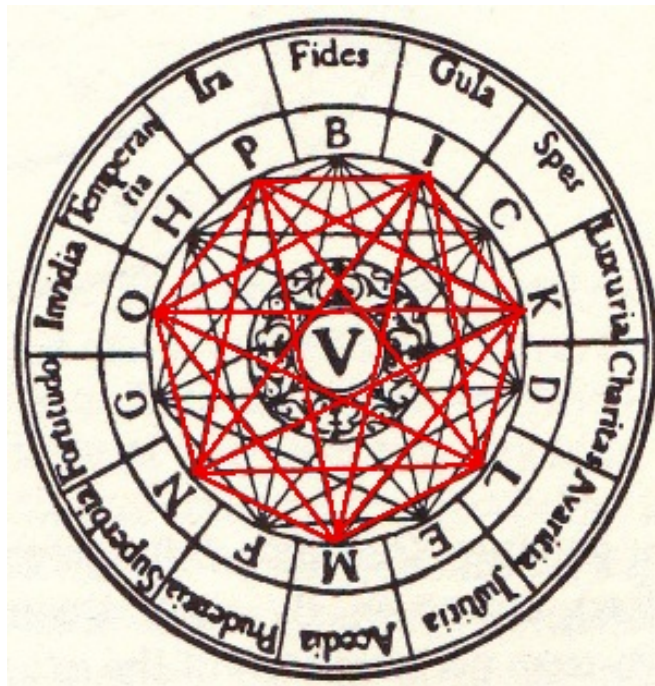


For each $Cl(8)$, Lull shows 28 lines between distinct pairs of vertices (disregarding order) corresponding to the 28 bivectors of that $Cl(8)$.

The 8 dimensions of each $Cl(8)$ vector space correspond to the 8-dimensional Octonions with basis $\{ 1, i, j, k, E, I, J, K \}$.

The 7 imaginary Octonion basis elements $\{ i, j, k, E, I, J, K \}$ correspond to the 7 dimensions of the unit 7-sphere S^7 in Octonionic space.

Lull's V-wheel has 7 vertices (red) for the vector space 7-sphere S^7 of one $Cl(8)$ and 7 vertices (black) for the vector space 7-sphere S^7 of the other $Cl(8)$



For each $Cl(8)$, Lull shows 21 lines between distinct pairs of vertices (disregarding order) corresponding to 21 new independent dimensions created by taking the Lie Group Product of points on S^7 .

Unlike the 3-sphere S^3 in Quaternionic space with basis $\{1, i, j, k\}$ for which the Lie Group Product of any two points is also a point on S^3 , the Lie Group Product of any two points on S^7 is NOT necessarily also a point on S^7 , but may lie in any of 21 newly formed independent dimensions,

so that

the Lie Group Product for S^7 produces the $7+21 = 28$ -dimensional Lie Group $Spin(8)$ of the bivectors for each $Cl(8)$.

At this point ,

Lull has described the basic ingredients for a high-energy (around Planck Energy) physics model with:

Clifford Algebra $Cl(8) = Cl(1,7) = 16 \times 16$ Real Matrix Algebra

8 first-generation fermion particles

8 first-generation fermion antiparticles

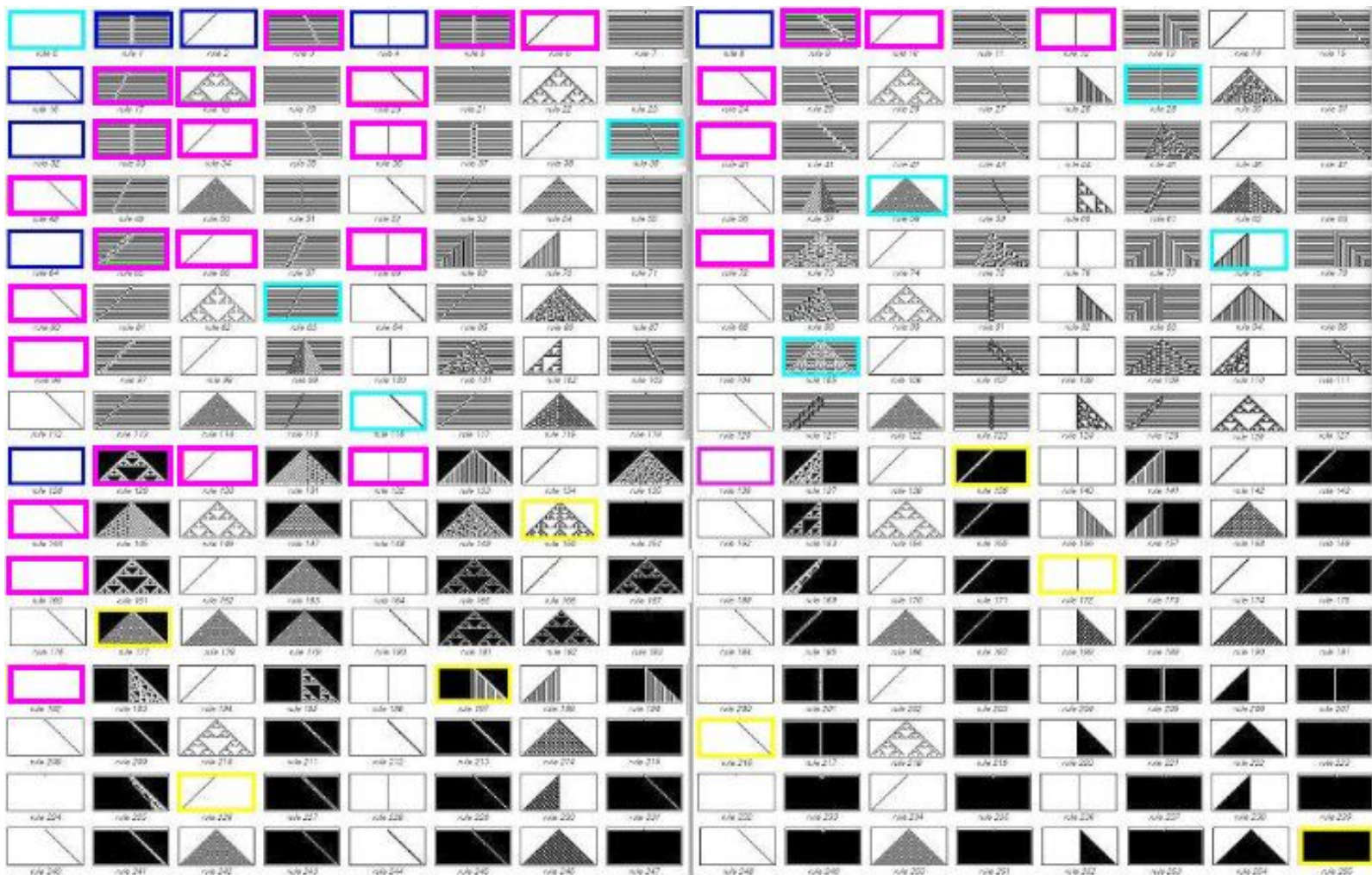
8-dimensional spacetime $RP1 \times S7$

28 $Spin(8) = Spin(1,7)$ gauge bosons

a Lagrangian integrated over the 8-dimensional spacetime with fermion and gauge boson terms

a Many-Worlds Sum-Over-Histories Path Integral Quantum Theory.

To visualize this $16 \times 16 = 256$ element structure, use the correspondence with the 256 Cellular Automata



with

blue for the 8 spacetime dimensions

cyan for the 8 +half-spinor first generation fermion particles

yellow for the 8 -half-spinor first generation antiparticles

magenta for the 28 Spin(8) gauge bosons.

The 256 Cellular Automata, in turn, correspond to the 256 Odu of IFA, so, with the same color coding, the structure of Lull's 8-dimensional Science can be seen in terms of the 256 Odu of IFA:

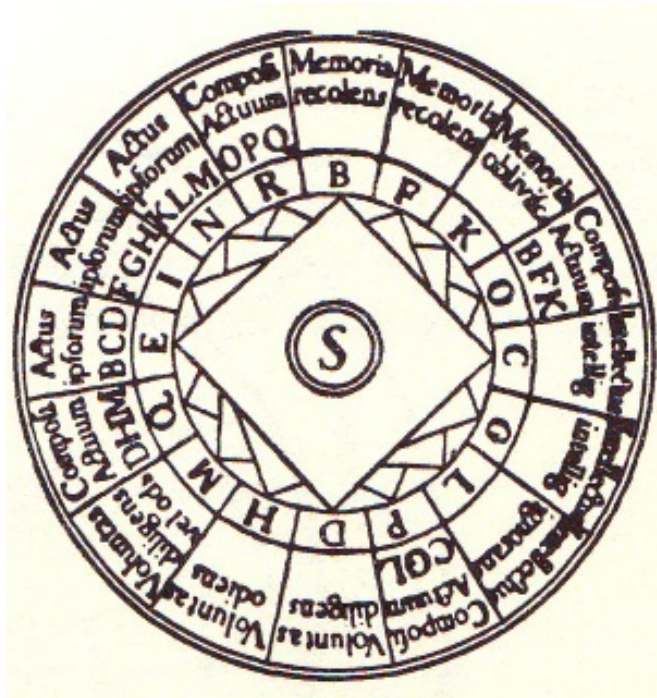
[\(click here or on the image to see a larger scale rotated 90 degrees\)](#)

The image displays a 16x16 grid of 256 small tables, each representing an Odu of IFA. Each cell contains a 4x4 matrix of numbers (0, 1, 2, 3) and a title. The cells are color-coded: cyan (8 cells), yellow (8 cells), and magenta (28 cells). The titles for the cells include various combinations of letters and numbers, such as '0 Odu - Odu', '1 Odu - Odu', etc., up to '255 Odu - Odu'. The color coding is as follows: cyan for 8 cells, yellow for 8 cells, and magenta for 28 cells.

The image displays a grid of 8x8 matrices, each representing a different configuration of Lull's Science Structure. The matrices are labeled with a number (e.g., 140, 141, 142) and a title (e.g., 'Spoken - Ojha', 'Spoken - Ojha'). The matrices are arranged in a grid, and several are highlighted with yellow boxes. The highlighted matrices are: 140 (Spoken - Ojha), 141 (Spoken - Ojha), 142 (Spoken - Ojha), 143 (Spoken - Ojha), 144 (Spoken - Ojha), 145 (Spoken - Ojha), 146 (Spoken - Ojha), 147 (Spoken - Ojha), 148 (Spoken - Ojha), 149 (Spoken - Ojha), 150 (Spoken - Ojha), 151 (Spoken - Ojha), 152 (Spoken - Ojha), 153 (Spoken - Ojha), 154 (Spoken - Ojha), 155 (Spoken - Ojha), 156 (Spoken - Ojha), 157 (Spoken - Ojha), 158 (Spoken - Ojha), 159 (Spoken - Ojha), 160 (Spoken - Ojha), 161 (Spoken - Ojha), 162 (Spoken - Ojha), 163 (Spoken - Ojha), 164 (Spoken - Ojha), 165 (Spoken - Ojha), 166 (Spoken - Ojha), 167 (Spoken - Ojha), 168 (Spoken - Ojha), 169 (Spoken - Ojha), 170 (Spoken - Ojha), 171 (Spoken - Ojha), 172 (Spoken - Ojha), 173 (Spoken - Ojha), 174 (Spoken - Ojha), 175 (Spoken - Ojha), 176 (Spoken - Ojha), 177 (Spoken - Ojha), 178 (Spoken - Ojha), 179 (Spoken - Ojha), 180 (Spoken - Ojha), 181 (Spoken - Ojha), 182 (Spoken - Ojha), 183 (Spoken - Ojha), 184 (Spoken - Ojha), 185 (Spoken - Ojha), 186 (Spoken - 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How is Lull's 8-dimensional Science Structure related to our 4-dimensional Physical Spacetime ?

At low (compared to Planck) energies, a 4-dimensional Quaternionic subspace Freezes Out of high-energy 8-dimensional spacetime. Its Quaternionic basis { 1 , i , j , k } corresponds to the 4 vertices of the S-square of Lull's S-wheel.



When the Quaternionic Structure is introduced, the 16x16 Real Matrix Algebra of $Cl(8) = Cl(1,7)$ is transformed into the 8x8 Quaternionic Matrix Algebra of $Cl(2,6)$.

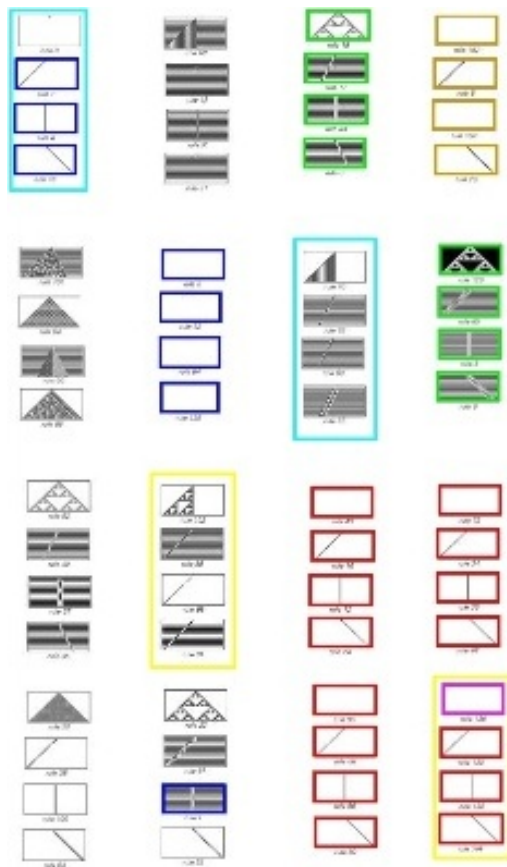
Full Spinors of the 8x8 Quaternionic Matrix Algebra of $Cl(2,6)$ have 8 Quaternion dimensions or 32 Real dimensions,

and so are incompatible with the 16-Real-dimensional Full Spinors of the 16x16 Real Matrix Algebra of $Cl(1,7) = Cl(8)$.

To get a Quaternionic Clifford Algebra with 16-Real-dimensional Full Spinors, in the form of 4 Quaternion dimensions, reduce

from $Cl(2,6) = 8x8$ Quaternionic Matrix Algebra

to the 4x4 Quaternionic Matrix Algebra of $Cl(2,4)$.



with

blue for the 4 spacetime dimensions and the 4 internal symmetry space dimensions

cyan for the 8 +half-spinor first generation +half-spinor fermion particles

yellow for the 8 -half-spinor first generation -half-spinor fermion antiparticles.

The fixed Quaternionic subspace corresponds to 4-dimensional Physical Spacetime with structure $RP1 \times S3$, with the remaining 4 dimensions of 8-dimensional Spacetime corresponding to a 4-dimensional Internal Symmetry Space with structure $CP2$.

Since the 28-dimensional gauge group $Spin(1,7)$ no longer has a unified 8-dimensional $RP1 \times S7$ Spacetime on which to act, its 28 generators break down into 28 generators capable of acting on 4-dimensional $RP1 \times S3$ Physical Spacetime and 4-dimensional $CP2$ Internal Symmetry Space:

magenta for the $U(1)$ propagator phase that is defined with respect to the fixed Quaternionic 4-dimensional spacetime subspace corresponding to the S-square of Lull's S-wheel

gold for the 4 $U(2)$ electroweak gauge bosons

green for the 8 $SU(3)$ color gluon gauge bosons

red for the 15 $SU(2,2) = Spin(2,4)$ Conformal Group graviphoton gauge bosons that act on 4-

dimensional Physical Spacetime by:

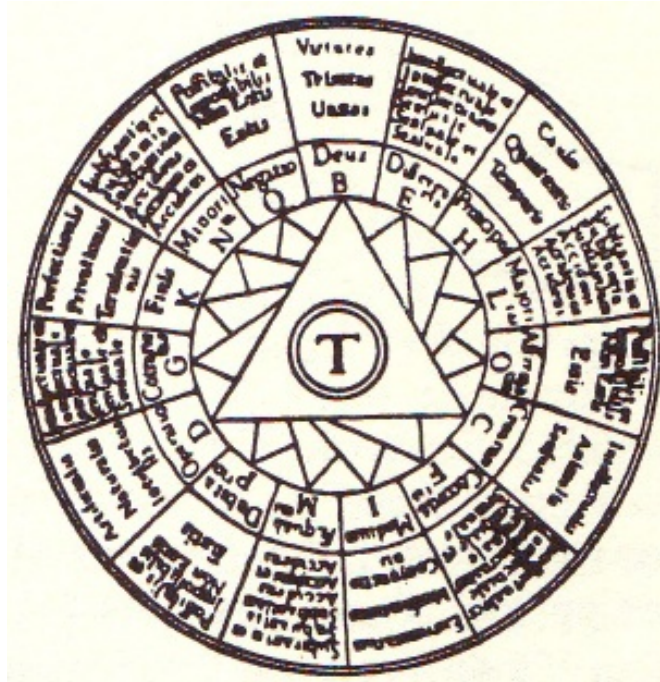
4 Translations,

6 Lorentz Transformations,

4 Special Conformal Transformations and 1 Dilation.

They produce Gravity through a generalized MacDowell-Mansouri mechanism,

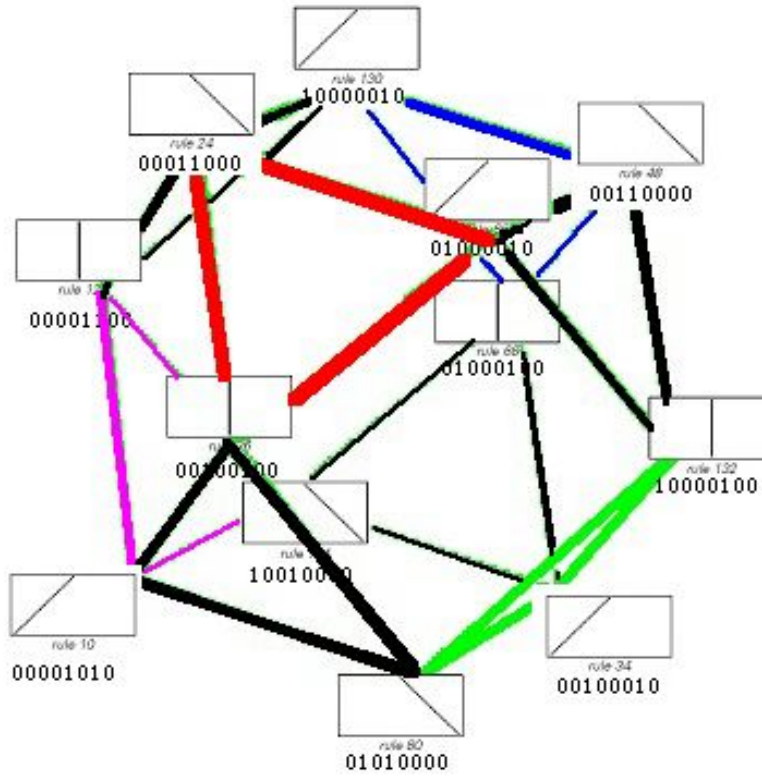
and are shown by Llull in his T-wheel



The 3 vertices of the T-triangle in Llull's T-wheel correspond to a 3-dimensional Cartan subalgebra of the 15-dimensional Conformal Group $SU(2,2) = Spin(2,4)$ and 3 Quaternionic Real (blank) Cellular Automata.



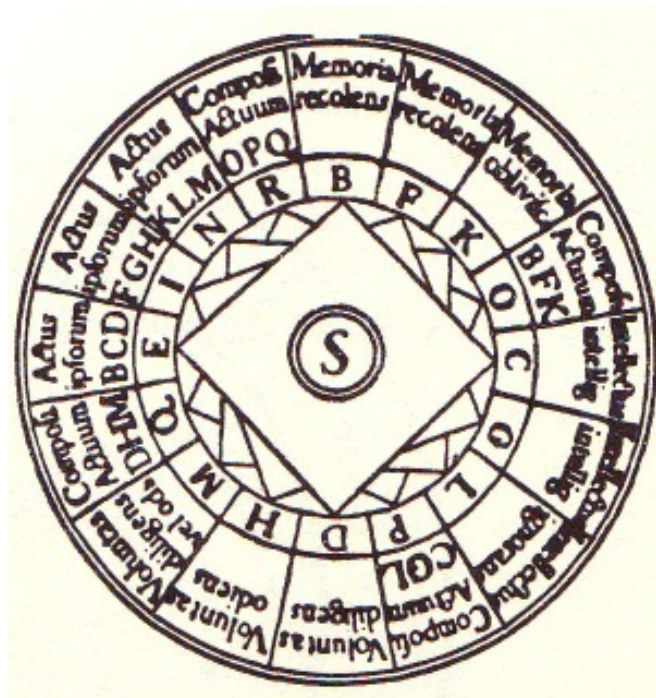
The other 4 triangles in Llull's T-wheel correspond to 4 sets of associative triples (/ | \) of Cellular Automata and to the 12 vertices of the Cuboctahedron Root Vector Polytope of the Conformal Group $SU(2,2) = Spin(2,4)$



and

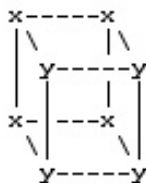
the other 4 triangles (red, blue, green, and magenta in the figure below) have $4 \times 3 = 12$ vertices corresponding to the 12 vertices of the cuboctahedron root vector polytope of the Conformal Group $SU(2,2) = Spin(2,4)$

Returning to Lull's S-wheel

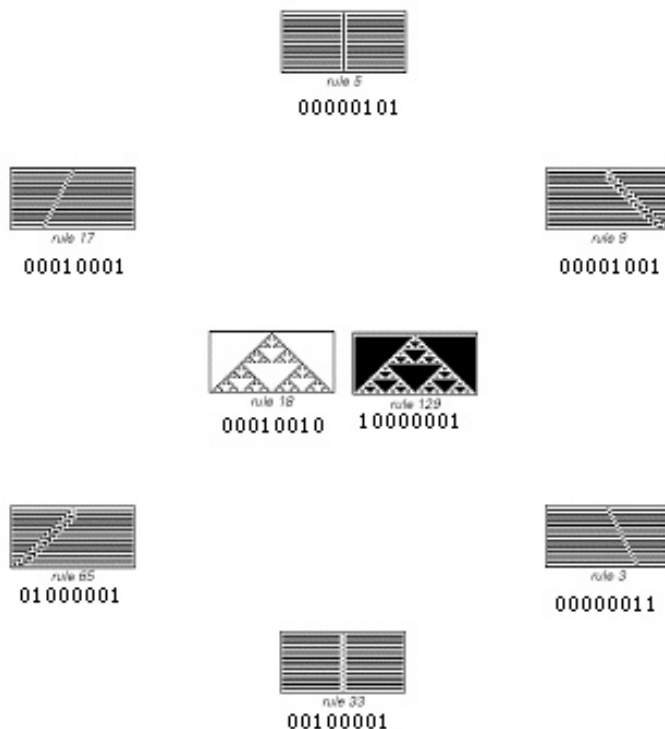


the remaining 3 squares of Ljull's S-wheel form the $SU(3) \times SU(2) \times U(1)$ Standard Model:

Two of the 3 squares can be considered as the vertices of a cube:

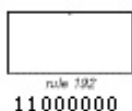


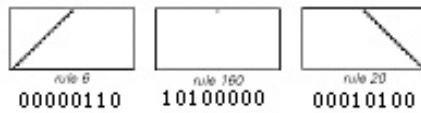
Now look at the cube along a diagonal axis, and project all 8 vertices onto a plane perpendicular to that axis, giving the root vector diagram of $SU(3)$



Since each gluon links 4-dim spacetime to color internal symmetry space, the gauge group $SU(3)$ acts globally on CP^2 Internal Symmetry Space, as can be seen by the fibration $CP^2 = SU(3) / U(2)$

The third of the remaining squares, that is the final square, corresponds to the 4 Cellular Automata





that correspond to the 3 SU(2) weak bosons and the U(1) electromagnetic photon.

Since $SU(2) \times U(1) = U(2)$, and since $CP^2 = SU(3) / U(2)$, they act locally on CP2 Internal Symmetry Space.

If you start with the Lagrangian over 8-dimensional Spacetime, and freeze out a Quaternionic subspace as described above,

you get a Lagrangian over 4-dimensional Physical Spacetime that allows you to calculate:

- • Me-neutrino = Mmu-neutrino = Mtau-neutrino = 0 (tree-level)

- Higher-order corrections give:

- Mneutrino1 = 0

$$Mneutrino2 = 9 \times 10^{(-3)} \text{ eV}$$

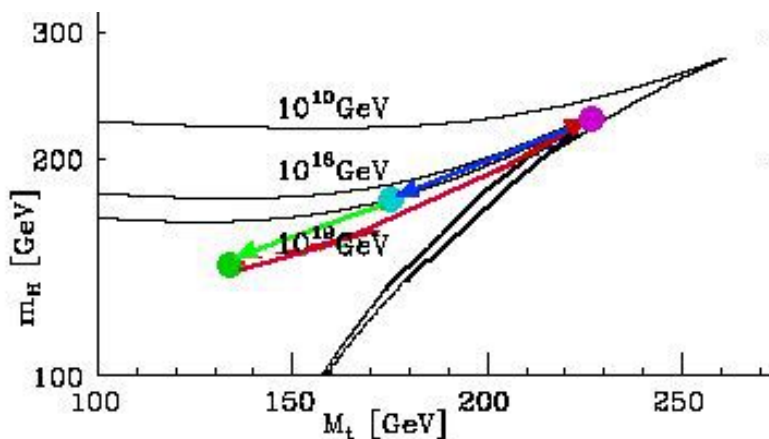
$$Mneutrino3 = 5.4 \times 10^{(-2)} \text{ eV}$$

Neutrino mixing matrix:

	nu_1	nu_2	nu_3
nu_e	0.87	0.50	0
nu_m	-0.35	0.61	0.71
nu_t	0.35	-0.61	0.71

- • Me = 0.5110 MeV
- • Md = Mu = 312.8 MeV (constituent quark mass)
- • Mmu = 104.8 MeV
- • Ms = 625 MeV (constituent quark mass)

- • $M_c = 2.09$ GeV (constituent quark mass)
- • $M_{\tau} = 1.88$ GeV
- • $M_b = 5.63$ GeV (constituent quark mass)
- • $M_t = 130$ GeV (constituent Truth Quark mass) as the ground state of a 3-state T-quark - Higgs - Triviality Boundary System



NJL state with Tquark mass = 130 GeV and Higgs mass = 146 GeV in the stable region far from the triviality and vacuum stability bounding curves and therefore closely related to other quarks in the stable region and therefore to single-Tquark events involving such things as T-Bbar events

8-dim Kaluza-Klein state with Tquark mass 172-175 GeV = and Higgs mass = 176-188 GeV, which state is closely related to the Higgs and T-Tbar condensates, and hence to T-Tbar events

BHL state with Tquark mass = 218 +/- 3 GeV and Higgs mass = 239 +/- 3 GeV at the Triviality Bound - Vacuum Stability Critical Point.

and

Kobayashi-Maskawa matrix:

	d	s	b
u	0.975	0.222	0.00249 -0.00388i
c	-0.222 -0.000161i	0.974 -0.0000365i	0.0423
t	0.00698 -0.00378i	-0.0418 -0.00086i	0.999

and

- • W^+ mass = W^- mass = 80.326 GeV
- • Z0 mass = 91.862 GeV
- • Higgs mass = 145.8 GeV
- • weak force - Higgs VEV = 252.5 GeV (assumed, since ratios are calculated)

as well as ratios of force strength constants:

- • Gravitational $G = (G_{gravity})(M_{proton})^2 = 5 \times 10^{(-39)}$ (assumed, since ratios are calculated)
- • electromagnetic fine structure constant = $1/137.03608$
- • $G_{fermi} = (G_{weak})(M_{proton})^2 = 1.02 \times 10^{(-5)}$
- • color force strength = 0.6286 (at 0.245 GeV) - perturbative QCD running gives
- • color force strength = 0.167 (at 5.3 GeV)
- • color force strength = 0.121 (at 34 GeV)
- • color force strength = 0.106 (at 91 GeV)

If Nonperturbative QCD and other things are taken into account, then the color force strength = 0.123 (at 91 GeV).

Dark Energy : Dark Matter : Ordinary Matter

Ratio

0.75 : 0.21 : 0.04

(for details of the physics model and the calculations, and for references and source material, see my web site at www.valdostamuseum.org/hamsmith/ or mirror site at www.tony5m17h.net/ the contents of which are hereby incorporated herein by this parenthetical reference)

So, following Llull's path leads to a Unified Physics Model that meets Einstein's Criterion:

"... a theorem which at present can not be based upon anything more than upon a faith in the simplicity, i.e., intelligibility, of nature:

there are no arbitrary constants ...

that is to say,

nature is so constituted that it is possible logically to lay down such strongly determined laws that within these laws only rationally completely determined constants occur

(not constants, therefore, whose numerical value could be changed without destroying the theory). ..."

and

Ramon Llull was a Nexus between the Ancient Wisdom of the 256 Odu of IFA and a Unified Model of 21st Century Physics.

His Lullian Wheels were only one of the ways by which he sought to transmit Ancient Wisdom to the People of his Future.

Within a century or two after Llull's death, his followers in what is now known as Italy produced the 78-card Tarot Deck of Cards.

Just as the practices of Divination had preserved in Africa

(and in the Mediterranean through 16-element Ilm al Raml, and in China through the 64-element I Ching, and in Japan through 128-element Futomani Book of Shinto Divination, and in India through the $24+192 = 240$ -element First Sukt of the Rig Veda)

the Ancient Wisdom of the 256 Odu of IFA,

the 78-Card Tarot Game/Divination

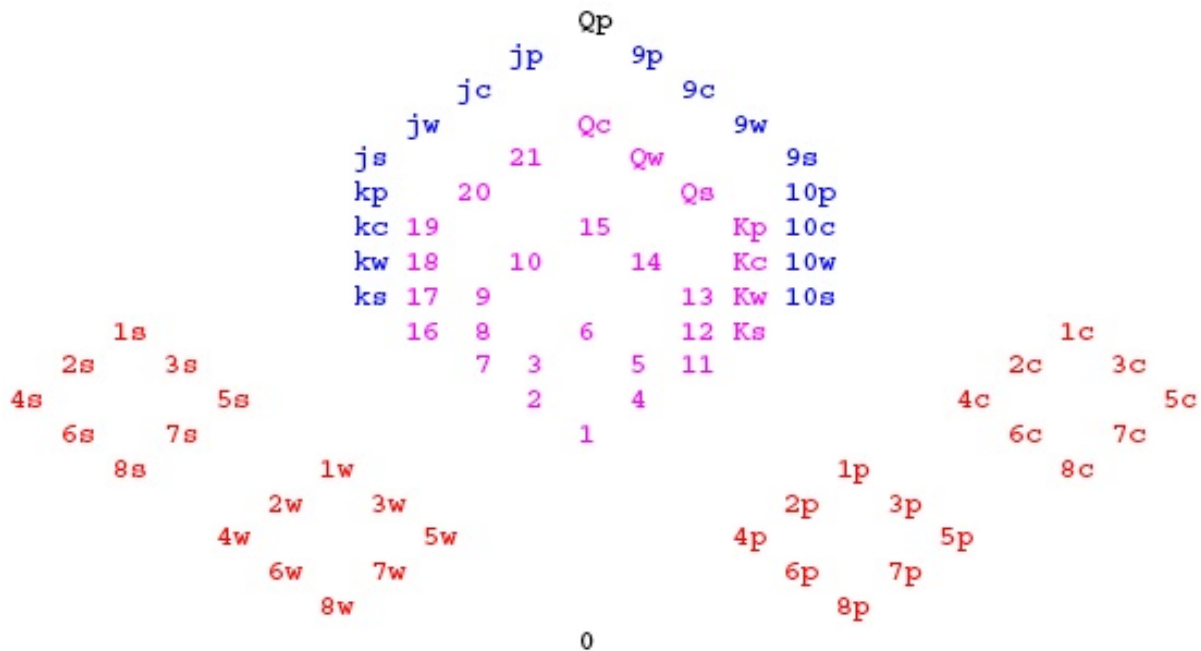
(and the common 52-Card Game Deck that descended from Tarot, which 52 Cards correspond to the 52-dimensional exceptional Lie Algebra F_4 of which the 78-dimensional exceptional Lie Algebra E_6 is a complexification)

would spread throughout the Global Society that began to be formed in the 1400-1500s and so preserve Fundamental Details of the Ancient Wisdom seen by Ramon Llull.

In this Tarot spread

(s=swords, w=wands, p=pentacles, c= cups and k=knave(page), j=Knight(Jack), K=King, Q=Queen, and

0=Fool, 1=Magician, 2=Popess, 3=Empress, 4=Emperor, 5=Pope, 6=Lovers, 7=Chariot, 8=Justice, 9=Hermit, 10=WheellofFate, 11=Strength, 12=HangedMan, 13=Death, 14=Temperance, 15=Devil, 16=Tower, 17=Star, 18=Moon, 19=Sun, 20=Judgment, 21=World)



- The 28 magenta 28 are the 28 Spin(8) adjoint bivectors of Cl(8).
- The 16 blue are the 8 vectors of Spin(8) and Cl(8) and their 8 dual/conjugates.
- The 32 red are the 16 spinors (8 +halfspinors and 8 -halfspinors) of Spin(8) and Cl(8) and their 16 dual/ conjugates.
- The 2 black are diagonal degrees of freedom in the 26-dim traceless J3(O) part of the J3(O) Jordan algebra.

Considered all together, the 78 Tarot Cards correspond to the 78 elements of the exceptional Lie Algebra E6, which has a 5-graded structure with dimensionalities

$$8 + 16 + (28+1+1) + 16 + 8$$

that represents the Lullian Realistic Unified Physics Model.

If you regard strings as world-lines of particles in the Quantum Path Integral Sum-Over-Histories in the Many-Worlds, then an E6 String Theory produces a generalized Bohm Quantum Potential, with Sarfatti-type Back-Reaction, that is useful in describing Penrose-Hameroff Quantum Consciousness.

In acting as a Nexus connecting Ancient Wisdom with 21st Century Physics,

Ramon Lull expressed what Einstein (in the New York Times Magazine on November 9, 1930 pp 1-4) called cosmic religious feeling:

"... It is very difficult to elucidate ... cosmic religious feeling ... to anyone who is entirely without it ...

The individual feels the futility of human desires and aims and the sublimity and marvelous order which reveal themselves both in nature and in the world of thought.

Individual existence impresses him as a sort of prison and he wants to experience the universe as a single significant whole.

... the cosmic religious feeling is the strongest and noblest motive for scientific research.

What a deep conviction of the rationality of the universe and what a yearning to understand ... Kepler and Newton must have had to enable them to spend years of solitary labor in disentangling the principles of celestial mechanics!

Those whose acquaintance with scientific research is derived chiefly from its practical results easily develop a completely false notion of the mentality of the men who, surrounded by a skeptical world, have shown the way to kindred spirits scattered wide through the world and through the centuries. ...

It is cosmic religious feeling that gives a man such strength. ...".

Frank Dodd (Tony) Smith, Jr.

April 2007

(for further material and details, and for references and source material, see my web site at www.valdostamuseum.org/hamsmith/ or mirror site at www.tony5m17h.net/ the contents of which are hereby incorporated herein by this parenthetical reference)

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240 Oyaku - Ogbu 00 0 00 0 00 0 00 0	224 Obara - Ogbu 0 0 0 0 0 0 0 0	208 Ika - Ogbu 0 0 0 0 0 0 0 0	192 Irosun - Ogbu 0 0 0 0 0 0 0 0	176 Oturopon - Ogbu 0 0 0 0 0 0 0 0	160 Ose - Ogbu 0 0 0 0 0 0 0 0	144 Iwori - Ogbu 0 0 0 0 0 0 0 0	128 Ogunda - Ogbu 0 0 0 0 0 0 0 0	112 Okanran - Ogbu 0 0 0 0 0 0 0 0	96 Bdi - Ogbu 0 0 0 0 0 0 0 0	80 Ofun - Ogbu 0 0 0 0 0 0 0 0	64 Irete - Ogbu 0 0 0 0 0 0 0 0	48 Owonrin - Ogbu 0 0 0 0 0 0 0 0	32 Otara - Ogbu 0 0 0 0 0 0 0 0	16 Osa - Ogbu 0 0 0 0 0 0 0 0	0 Ogbu - Ogbu 0 0 0 0 0 0 0 0
241 Oyaku - Osa 00 00 00 00 00 00 00 00	225 Obara - Osa 0 0 0 0 0 0 0 0	209 Ika - Osa 0 0 0 0 0 0 0 0	193 Irosun - Osa 0 0 0 0 0 0 0 0	177 Oturopon - Osa 0 0 0 0 0 0 0 0	161 Ose - Osa 0 0 0 0 0 0 0 0	145 Iwori - Osa 0 0 0 0 0 0 0 0	129 Ogunda - Osa 0 0 0 0 0 0 0 0	113 Okanran - Osa 0 0 0 0 0 0 0 0	97 Bdi - Osa 0 0 0 0 0 0 0 0	81 Ofun - Osa 0 0 0 0 0 0 0 0	65 Irete - Osa 0 0 0 0 0 0 0 0	49 Owonrin - Osa 0 0 0 0 0 0 0 0	33 Otara - Osa 0 0 0 0 0 0 0 0	17 Osa - Osa 0 0 0 0 0 0 0 0	1 Ogbu - Osa 0 0 0 0 0 0 0 0
242 Oyaku - Otura 00 0 00 0 00 0 00 0	226 Obara - Otura 0 0 0 0 0 0 0 0	210 Ofun - Otura 0 0 0 0 0 0 0 0	194 Irosun - Otura 0 0 0 0 0 0 0 0	178 Oturopon - Otura 0 0 0 0 0 0 0 0	162 Ose - Otura 0 0 0 0 0 0 0 0	146 Iwori - Otura 0 0 0 0 0 0 0 0	130 Ogunda - Otura 0 0 0 0 0 0 0 0	114 Okanran - Otura 0 0 0 0 0 0 0 0	98 Bdi - Otura 0 0 0 0 0 0 0 0	82 Ofun - Otura 0 0 0 0 0 0 0 0	66 Irete - Otura 0 0 0 0 0 0 0 0	50 Owonrin - Otura 0 0 0 0 0 0 0 0	34 Otara - Otura 0 0 0 0 0 0 0 0	18 Osa - Otura 0 0 0 0 0 0 0 0	2 Ogbu - Otura 0 0 0 0 0 0 0 0
243 Oyaku - Owonrin 00 00 00 00 00 00 00 00	227 Obara - Owonrin 0 0 0 0 0 0 0 0	211 Ika - Owonrin 0 0 0 0 0 0 0 0	195 Irosun - Owonrin 0 0 0 0 0 0 0 0	179 Oturopon - Owonrin 0 0 0 0 0 0 0 0	163 Osa - Owonrin 0 0 0 0 0 0 0 0	147 Iwori - Owonrin 0 0 0 0 0 0 0 0	131 Ogunda - Owonrin 0 0 0 0 0 0 0 0	115 Okanran - Owonrin 0 0 0 0 0 0 0 0	99 Bdi - Owonrin 0 0 0 0 0 0 0 0	83 Ofun - Owonrin 0 0 0 0 0 0 0 0	67 Irete - Owonrin 0 0 0 0 0 0 0 0	51 Owonrin - Owonrin 0 0 0 0 0 0 0 0	35 Otara - Owonrin 0 0 0 0 0 0 0 0	19 Osa - Owonrin 0 0 0 0 0 0 0 0	3 Ogbu - Owonrin 0 0 0 0 0 0 0 0
244 Oyaku - Irete 00 0 00 0 00 0 00 0	228 Obara - Irete 0 0 0 0 0 0 0 0	212 Ika - Irete 0 0 0 0 0 0 0 0	196 Irosun - Irete 0 0 0 0 0 0 0 0	180 Oturopon - Irete 0 0 0 0 0 0 0 0	164 Osa - Irete 0 0 0 0 0 0 0 0	148 Iwori - Irete 0 0 0 0 0 0 0 0	132 Ogunda - Irete 0 0 0 0 0 0 0 0	116 Okanran - Irete 0 0 0 0 0 0 0 0	100 Bdi - Irete 0 0 0 0 0 0 0 0	84 Ofun - Irete 0 0 0 0 0 0 0 0	68 Irete - Irete 0 0 0 0 0 0 0 0	52 Owonrin - Irete 0 0 0 0 0 0 0 0	36 Otara - Irete 0 0 0 0 0 0 0 0	20 Osa - Irete 0 0 0 0 0 0 0 0	4 Ogbu - Irete 0 0 0 0 0 0 0 0
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246 Oyaku - Bdi 00 0 00 0 00 0 00 0	230 Obara - Bdi 0 0 0 0 0 0 0 0	214 Ika - Bdi 0 0 0 0 0 0 0 0	198 Irosun - Bdi 0 0 0 0 0 0 0 0	182 Oturopon - Bdi 0 0 0 0 0 0 0 0	166 Osa - Bdi 0 0 0 0 0 0 0 0	150 Iwori - Bdi 0 0 0 0 0 0 0 0	134 Ogunda - Bdi 0 0 0 0 0 0 0 0	118 Okanran - Bdi 0 0 0 0 0 0 0 0	102 Bdi - Bdi 0 0 0 0 0 0 0 0	86 Ofun - Bdi 0 0 0 0 0 0 0 0	70 Irete - Bdi 0 0 0 0 0 0 0 0	54 Owonrin - Bdi 0 0 0 0 0 0 0 0	38 Otara - Bdi 0 0 0 0 0 0 0 0	22 Osa - Bdi 0 0 0 0 0 0 0 0	6 Ogbu - Bdi 0 0 0 0 0 0 0 0
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248 Oyaku - Ogunda 00 0 00 0 00 0 00 0	232 Obara - Ogunda 0 0 0 0 0 0 0 0	216 Ika - Ogunda 0 0 0 0 0 0 0 0	200 Irosun - Ogunda 0 0 0 0 0 0 0 0	184 Oturopon - Ogunda 0 0 0 0 0 0 0 0	168 Osa - Ogunda 0 0 0 0 0 0 0 0	152 Iwori - Ogunda 0 0 0 0 0 0 0 0	136 Ogunda - Ogunda 0 0 0 0 0 0 0 0	120 Okanran - Ogunda 0 0 0 0 0 0 0 0	104 Bdi - Ogunda 0 0 0 0 0 0 0 0	88 Ofun - Ogunda 0 0 0 0 0 0 0 0	72 Irete - Ogunda 0 0 0 0 0 0 0 0	56 Owonrin - Ogunda 0 0 0 0 0 0 0 0	40 Otara - Ogunda 0 0 0 0 0 0 0 0	24 Osa - Ogunda 0 0 0 0 0 0 0 0	8 Ogbu - Ogunda 0 0 0 0 0 0 0 0
249 Oyaku - Iwori 00 0 00 0 00 0 00 0	233 Obara - Iwori 0 0 0 0 0 0 0 0	217 Ika - Iwori 0 0 0 0 0 0 0 0	201 Irosun - Iwori 0 0 0 0 0 0 0 0	185 Oturopon - Iwori 0 0 0 0 0 0 0 0	169 Osa - Iwori 0 0 0 0 0 0 0 0	153 Iwori - Iwori 0 0 0 0 0 0 0 0	137 Ogunda - Iwori 0 0 0 0 0 0 0 0	121 Okanran - Iwori 0 0 0 0 0 0 0 0	105 Bdi - Iwori 0 0 0 0 0 0 0 0	89 Ofun - Iwori 0 0 0 0 0 0 0 0	73 Irete - Iwori 0 0 0 0 0 0 0 0	57 Owonrin - Iwori 0 0 0 0 0 0 0 0	41 Otara - Iwori 0 0 0 0 0 0 0 0	25 Osa - Iwori 0 0 0 0 0 0 0 0	9 Ogbu - Iwori 0 0 0 0 0 0 0 0
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